

*Fort Bend County, Texas  
Request for Proposals*



*Construction of Elections Building  
for Fort Bend County  
RFP 24-029*

**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, February 13, 2024  
2:00 PM (Central)

**MARK ENVELOPE:**

RFP 24-029  
Elections Building

***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:  
Brooke Lindemann  
Senior Buyer  
[Brooke.Lindemann@fortbendcountytexas.gov](mailto:Brooke.Lindemann@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)				
Type of Business	Corporation/LLC Sole Proprietor/Individual	Partnership Tax Exempt	Age in Business?	
Federal ID # or S.S. #		SAM.gov Unique Entity ID #		
SAM.gov CAGE / NCAGE				
Publicly Traded Business	___ No                      ___ Yes Ticker Symbol _____			
Remittance Address				
City/State/Zip				
Physical Address				
City/State/Zip				
Phone Number				
E-mail				
Contact Person				
Check all that apply to the company listed above and provide certification number.	DBE-Disadvantaged Business Enterprise ___	<b>Certification #</b> _____	<u>Cert Date</u>	<u>Exp Date</u>
	SBE-Small Business Enterprise ___	<b>Certification #</b> _____	_____	_____
	HUB-Texas Historically Underutilized Business ___	<b>Certification #</b> _____	_____	_____
	WBE-Women's Business Enterprise ___	<b>Certification #</b> _____	_____	_____
Company's gross annual receipts	<\$500,000 _____	\$500,000-\$4,999,999 _____		
	\$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 Elections Building (“Project”), located in Rosenberg, Texas.

Vendor to construct new 48,000 square foot tilt-wall building at 3700 Bamore Road in Rosenberg, Texas 77471. The facility will be one story, consisting of approximately 11,000 square feet of administrative office and meeting space, as well as 37,000 square feet of climate controlled warehouse. Site improvements include concrete paving for approximately one-hundred (100) vehicle spaces, lighting, and required landscaping and irrigation.

## **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:

Brooke Lindemann  
Senior Buyer  
Fort Bend County Travis Annex  
301 Jackson, Suite 201  
Richmond, Texas 77469  
[Brooke.Lindemann@fortbendcountytexas.gov](mailto:Brooke.Lindemann@fortbendcountytexas.gov)  
Phone: 281.344.3929

### 4.0 SUBMISSION REQUIREMENTS:

- 4.1 Submission requirements: one (1) original proposal, four (4) paper copies, and one (1) electronic response on flash drive are required by RFP opening time of **2:00 PM on Tuesday, February 13, 2024**. 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: R24-029
Purchasing Department	Due Date: February 13, 2024
301 Jackson, Suite 201	Time: 2:00 PM (CST)
Richmond, Texas 77469	For: Elections Building

- 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, February 6, 2024 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:	January 21, 2024
Pre-RFP conference:	January 30, 2024
Deadline for Questions:	February 6, 2024
Submission Due Date:	February 13, 2024
Evaluation of Submissions:	Week of February 13th
Commissioners Court Permission to Negotiate:	February 27, 2024
Negotiations:	Beginning February 28, 2024
Final Contract Approval Commissioners Court:	March 12, 2024

**9.0 PRE-RFP CONFERENCE:**

A Pre-RFP conference will be conducted on **Tuesday, January 30, 2024 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 24-029

21.2.3 Description is: Construction of Elections Building

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: TX20230247 12/22/2023

Superseded General Decision Number: TX20220247

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 \$16.20 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 2023.

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 \$12.15 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 2023.

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	01/06/2023
1	01/13/2023
2	05/05/2023

3	08/25/2023
4	09/01/2023
5	10/13/2023
6	12/22/2023

	Rates	Fringes
ASBE0022-009 07/03/2023		
ASBESTOS WORKER/HEAT & FROST INSULATOR (Duct, Pipe and Mechanical System Insulation)	\$ 28.35	16.02
BOIL0074-003 07/01/2023 BOILERMAKER	\$ 37.00	24.64
CARP0551-008 04/01/2021 CARPENTER (Excludes Acoustical Ceiling Installation, Drywall Hanging, Form Work and Metal Stud Installation)	\$ 25.86	9.08
ELEC0716-005 08/29/2023 ELECTRICIAN (Excludes Low Voltage Wiring and Installation of Alarms)	\$ 34.50	10.41
ELEV0031-003 01/01/2023 ELEVATOR MECHANIC	\$ 49.15	37.335+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 06/01/2023 IRONWORKER (ORNAMENTAL AND STRUCTURAL)	\$ 27.51	8.13
PLAS0783-001 04/01/2023 PLASTERER	\$ 31.34	10.30
PLUM0068-002 10/01/2023 PLUMBER	\$ 34.86	11.68
*PLUM0211-010 10/01/2023		

PIPEFITTER (Including HVAC Pipe Installation)	\$ 38.31	12.61
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 (\$16.20) or 13658 (\$12.15). 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/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

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: 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.	1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.	
	2 Business name/disregarded entity name, if different from above	
	3 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) ▶	4 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>
	5 Address (number, street, and apt. or suite no.)	Requester's name and address (optional)
	6 City, state, and ZIP code	
	7 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.

Social security number									
-									
-									
or									
Employer identification number									
-									

### Part II Certification

Under penalties of perjury, I certify that:

1. 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
2. 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
3. I am a U.S. citizen or other U.S. person (defined below); and
4. 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.

Sign Here	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:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. 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
4. 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*
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 24-029**  
**Construction of Elections Building**

**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

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**DOCUMENT 00 31 32**  
**GEOTECHNICAL DATA**

**1.01 GEOTECHNICAL DATA**

- A. Geotechnical Investigation Report has been prepared by the firm of Geoscience Engineering and Testing, Inc.. This report is identified as "Geotechnical Investigation - Proposed Fort Bend County Elections Administration Facility; Building, Pavement, and Detention Pond Recommendation; Northwest of Bamore Road and Klaycke Road, Rosenberg, Texas", 23G12413, and is dated December 2023.
1. The opinions expressed in this report are those of a geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by a geotechnical engineer. The Owner, the Architect, and the Architect's consultants, are not responsible for interpretations or conclusions drawn from the data.
  2. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for the Contractor's convenience and are intended to supplement rather than serve in lieu of the Contractor's own investigations. This Document and its attachments are not part of the Contract Documents.
- B. A copy of the report is attached and shall be referred to for a complete description of the conditions at the site.

**1.02 CONTRACTOR'S USE OF GEOTECHNICAL DATA**

- A. This report was obtained only for use by the Owner, the Architect, the Architect's consultants, in designing building foundations and pavements and is not a part of the Contract Documents. . The report and log of borings is available for the Contractor's information but are not a warranty of the subsurface conditions. The Contractor may use the report at his own risk.
- B. Because subsurface conditions indicated by the soil borings are a sampling in relation to the entire construction area, and for other reasons, the Owner, the Architect, the Architect's consultants, and the firm reporting the subsurface conditions do not warranty the conditions below the depths of the borings or that the strata logged from the borings are necessarily typical of the entire site. Any party using the information described in the soil borings and geotechnical report shall accept full responsibility for its use.
- C. The Contractor shall review the applicable portions of Geotechnical Investigation Report and the technical sections of this Project Manual. The Architect shall be notified of any discrepancies immediately. In the event of a conflict between the applicable portions of the Geotechnical Investigation Report and the technical sections, the stricter requirement shall govern.

- D. The Contractor shall visit the site and acquaint himself with site conditions. Prior to bidding, the Contractor may make his own subsurface investigation to satisfy himself with site and subsurface conditions.
- E. Make no deviations from the recommendations of the Geotechnical Investigation Report and the requirements of the Contract Documents without specific and written approval of the Owner or Architect.

**END OF DOCUMENT**

**GEOTECHNICAL INVESTIGATION**

Proposed Fort Bend County Elections Administration Facility  
Building, Pavement, and Detention Pond Recommendation  
Northwest of Bamore Road and Klaycke Road  
Rosenberg, Texas

Reported to:  
Fort Bend County  
Richmond, Texas

Prepared by:  
Geoscience Engineering and Testing, Inc.  
Houston, Texas

PROJECT NO: 23G12413

December 2023



HOUSTON

THE WOODLANDS

December 18, 2023

Fort Bend County  
301 Jackson Street, Suite# 301  
Richmond, Texas 77469

Attention: James Knight | Director of Facilities  
Fort Bend County  
Facilities Management & Planning

Reference: **Geotechnical Investigation**  
Proposed Fort Bend County Elections Administration Facility  
Building, Pavement, and Detention Pond Recommendation  
Northwest of Bamore Road and Klaycke Road  
Rosenberg, Texas  
GETI NO: 23G12413

Dear Mr. Knight:

GeoScience Engineering & Testing, Inc., (GETI) is pleased to submit this report for the above referenced project. This study was authorized by you on November 21, 2023, in accordance with GETI Proposal No: 23-11833A-Rev. 1, dated September 26, 2023. 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 questions concerning this report or require additional information, please contact us.

With Kindest Regards,

Dunya AL Abbas  
Geotechnical Specialist

Roham Golrokh, PE  
Vice President – Engineering Services

Telfryn L. John, PE  
Principal Engineer

F-4802

Copies Submitted: (1)

## I. INTRODUCTION

**Geoscience Engineering and Testing, Inc. (GETI)** is pleased to submit this technical report of our recent geotechnical investigation of subsurface conditions at the proposed development for the Fort Bend County Elections Administration Facility located northwest of Bamore Road and Klaycke Road in Rosenberg, Texas. GETI's investigation was authorized by Mr. James Knight, Director of Fort Bend County Facilities Management and Planning, on November 21, 2023.

Plate Nos. 1a and 1b depict the proposed project site plan and boring locations.

Per the obtained information, the proposed development includes a building, pavement areas, and a detention pond. The principal elements of the proposed project are listed as follows:

1. Main Office/Warehouse with an area of 48,000 SF.
2. Using concrete tilt up walls, with 100-kip specific maximum column load, 5-kips / linear foot maximum wall load, and assumed dock height of 4-feet.
3. Detention pond with 6-feet depth and dry bottom, by means of extending the footprint of the existing detention pond.
4. Paving for parking areas. Traffic over the paved areas will include cars, delivery trucks, and garbage trucks. Sections of paving will be developed with designated lanes and areas for specific traffic.

The geotechnical investigation aimed to determine the subsurface soil conditions at the site of the proposed project site with particular reference to the recommendations for the design of the foundation for the structure, pavement, and detention pond.

## II. SUBSURFACE EXPLORATION

### 1. General

The scope of this investigation included a survey of the immediate site, the subsurface exploration, field, and laboratory testing, engineering analysis, and evaluation of the subsurface materials. The purpose of this subsurface exploration and analysis was to determine soil profile components, and the engineering characteristics of the subsurface materials and to provide criteria for use by design engineers and architects in preparing the proposed structure foundation, pavement, and detention pond.

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 information and the preliminary design details furnished by Mr. James Knight with Fort Bend County Facilities Management and Planning. Any revision of plans for the proposed buildings, detention pond, 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 Fort Bend County Elections Administration Facility, upon which this subsurface exploration has been made, is located northwest of Bamore Road and Klaycke Road in Rosenberg, Fort Bend County, Texas. The site is on the northeast of a parcel bisected by a pipeline easement and with an existing Fort Bend County Medical Facility in the southwest. The site is relatively flat and covered with grass. The surface soil was fat clay materials at the time of the drilling operation.

The site geology for the geographic area corresponds to the Beaumont Formation with, the Quaternary Period, and Holocene, Pleistocene Epoch or Series<sup>1</sup>.

## 3. Field Investigation

The field investigation, completed on December 06, 2023, and performed to determine the engineering characteristics of the subsurface materials included a reconnaissance of the project site, drilling of the exploratory borings, and recovering the representative soil samples.

Subsurface soil conditions were explored by advancing and sampling nine soil test borings. The soil borings B-1 through B-4 were drilled at the proposed office building to a depth of 25-feet, each, B-5 to B-6 and B-9 were drilled at the proposed pavement area to a depth of 6-feet and 10-feet, respectively, and B-7 and B-8 were drilled at the proposed detention pond to a depth of 10-feet, each, below the existing ground surface. The following table provides the boring coordinates. These coordinates are based on GPS used on-site and may have a small uncertainty.

BORING ID.	BORING LOCATION	COORDINATES	BORING DEPTH, ft.
B-1	Office/Warehouse Building	29.525173 N, -95.824155 W	25
B-2		29.525168 N, -95.824408 W	25
B-3		29.525650 N, -95.824741 W	25
B-4		29.525567 N, -95.824980 W	25
B-5	Parking Area	29.524856 N, -95.824500 W	6
B-6		29.524918 N, -95.824006 W	6
B-9		29.524961 N, -95.824923 W	10
B-7	Detention Pond	29.525533 N, -95.824110 W	10
B-8		29.525944 N, -95.824616 W	10

A Google Earth photo with boring locations within the proposed study area and a vicinity map are provided in the attached Plates No.1a to 1b.

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 10. Keys to Terms and Symbols used on the Soil Boring Logs are shown on Plate No. 11. Photographs appear on Plate No. 14.

<sup>1</sup> Note: USGS, TNRIS, UTBEG, GEOLOGIC ATLAS OF TEXAS

The soil borings were of a 3-inch nominal diameter. Both relatively undisturbed and disturbed soil samples were obtained at 2-feet intervals continuously to a depth of 12-feet, between 13 and 15-feet, and at 5-feet 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.

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, to aid in characterizing the soil consistency.

### **3.2 Water Level Measurement**

The information in this report summarizes conditions as found on the date the borings were drilled. Ground water was NOT encountered during the drilling operation. Long-term monitoring of the ground water level was beyond the scope of this study. It should be noted that the ground water 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> did not reveal any well-documented principal faults within a 1-mile radius of the site. 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 borings 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:

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<sup>2</sup> Note: USGS, Verbeek and Clanton (1978), Shah and Lanning-Rush (2005)



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
Determining Dispersive Characteristics of Clayey Soils by the Crumb Test	ASTM D6572

The strength properties of the soils were determined by means of unconfined compression tests performed on undisturbed samples. The type and number of laboratory tests performed for this investigation are:

DESCRIPTIONS	No. of Test	DESCRIPTIONS	No. of Test
Hand Penetrometer Test	57	Unconfined Compressive Test	4
Moisture Content Test	57	Percent soils passing No. 200 Sieve	6
Atterberg Limits	24	Crumb Tests	4
Dry Density Test	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 10.

### 5.1 Dispersion Test – Crumb Test (ASTM D6572)

Dispersive soils are highly erosive, possibly subject to high shrink-swell potential, may have lower shear strength, and hence are prone to failure. The dispersive characteristics of the soils at the site were evaluated in the laboratory by performing Crumb Tests. In the crumb test, the dispersive nature of the soils is evaluated based on the turbidity of a distilled water solution when a 1.5-cm diameter or square soil sample is introduced in this solution. Dispersive soils will lead to the solution becoming cloudy, while the solution remains clear with non-dispersive soils. For the test results, Grade 1 indicates non-dispersive soil, Grade 2 indicates slightly dispersive soil, Grade 3 indicates a moderately dispersive soil, and Grade 4 indicates highly dispersive soil.

A crumb test was performed in our laboratory on 4 representative samples obtained from borings drilled in the detention pond area, and the results are tabulated below. The results suggest the presence of non-dispersive soils at the site as indicated by Grade 1 for all tested samples.

BORING NUMBER	SAMPLE DEPTH, FT.	SIL TYPE	CRUMB TEST GRADE
B- 7	0 - 2	FAT CLAY	Grade 1
	6 - 8	FAT CLAY	Grade 1
B- 8	0 - 2	FAT CLAY	Grade 1
	8 - 10	FAT CLAY	Grade 1

### III. GENERAL DESCRIPTION OF SUBSURFACE MATERIALS

The specific subsurface stratigraphy as determined by the field exploration is shown in detail on the soil boring logs herein. However, the stratigraphy can be generalized as follows:

STRATUM NUMBER	RANGE OF DEPTH, Ft.	BORING NUMBER	SOIL DESCRIPTION
I	0 – 25'	B-1 & B-2	Firm to hard, dark gray, reddish-brown, and light brown FAT CLAY with ferrous stains, and scattered calcareous nodules (CH)*
	0 – 18'	B-3	
	0 – 6'	B-5 & B-6	
	0 – 10'	B-7, B-8, & B-9	
II	18' – 25'	B-3	Firm to stiff, reddish-brown CLAYEY SAND (SC)*

\* Classification is in accordance with the Unified Soil Classification System (USCS) and TEX-141E.

Laboratory test results for the soils indicate Liquid Limits (LL) ranging from 40 to 84 percent, Plasticity Indices (PI) ranging from 24 to 53, and moisture content from 13 to 28 percent.

#### 1. Swell Potential

Based on plasticity index results, clayey sand, and fat clay subsoils are characterized as having a high 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 soil decreases, the soil volume decreases. The volume changes can result in foundation movement and stress.

#### 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 the current moisture profile. Based on the method, the potential vertical rise (PVR) at the locations of the test borings drilled is estimated to be about **4½ -inches**. More movement will 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 approximately 1-inch when 6½ -feet of the existing topsoil is replaced with structural select fill material with a Liquid Limit (LL) of less than 35 percent and a Plasticity Index (PI) between 10 to 20. Alternatively, the estimated PVR value can be reduced to less than 1-inch by stabilizing the top 8-inches of the cut grade with 7% lime and elevating the grade with at least 5½ -inches 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 the effectiveness and influence on foundation design parameters. GETI should be contacted concerning monitoring and testing criteria, and sampling and testing.*

#### IV. PROPOSED FOUNDATION RECOMMENDATIONS (Based on Soil Borings B-1 through B-4)

##### 1. Foundations and Risks

Many lightly loaded 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 these foundations must be stiffened in the areas where expansive soils are present, and trees should be removed before 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 concerning 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 foundations such as Slab-on-Grade, Spread Footings, Underreamed Drilled (Belled) Footings, Straight Shaft Footings, etc. are discussed for the support of the proposed structure.

Based on the field investigation and laboratory test results, the soils are clayey sand, and fat clay having a high to very high shrink/swell potential. Details of soil strata are given in soil boring logs, Plate Nos. 2 through 10.

In our opinion, for this type of soil strata Underreamed Drilled (Belled) footing, Structural Floor with Crawl Space and Deep Foundations (Pier and Beam), Shallow Foundation (Slab-on-Grade), and Spread Footings are considered suitable foundation systems. **The Shallow Foundation (Slab-on-Grade) and Spread Footings Foundations are less recommended due to the high plasticity fat clay soils in the proposed site.** Details are given in the following sections.

##### 2.1 Underreamed Footings (Drilled Piers) – Recommended More

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 least at a depth of **13-feet** below the existing grade. The pier footings should bear on the same elevation belled in the layer of stiff to hard, reddish brown fat clay.

The footing on these sites may be sized for an estimated net allowable bearing pressure of **3,500 psf** for dead load plus sustained live load. The bearing pressure contains a factor of safety of  $FS \sim 2.5$  and may be increased by 25 percent for total load conditions, whichever is critical. Spacing between the centers of the two adjacent footings should be at least 3 times the bell diameter.

The plinths of the underreamed footings 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 **1.5 tsf** should be applied to the straight shaft portion of the drilled footings for the computation of uplift loads.

Ground water was NOT encountered during the drilling operation. However, the water table may be expected to fluctuate with environmental variations. The caving of soils around the footings may occur during the construction of the drilled piers due to the presence of sand. In case the bell on the drilled footings cannot be constructed due to the occurrence of caving, it is recommended that the construction contractor use cased piers or convert this Underreamed footing to Straight shaft footings immediately. Should the straight shaft footings be used due to the 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 ground water. In such cases, shaft piers are installed by placing concrete using the '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 piers is to utilize a 3.0 to 1.0 for underream to shaft ratio. Should caving occur during the belling 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 degrees. 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 a 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 subsoil data in 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 has been properly prepared. The geotechnical engineer should be immediately notified if any subsoil condition is 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.

Before the 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 buildup of 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 the 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. The 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 of using the void boxes is when the underlying expansive soils swell, the void boxes will then collapse, thus minimizing the uplift loads caused by 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 of 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 outlined in the "Structural Fill and Subgrade Preparation".

Due to the soil characteristics at this site, at least **42-inches** of structural select fill materials having a Liquid Limit less than 35 percent and a Plasticity Index (PI) between 10 & 20 are strongly advised for placement 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.

### 2.1.1 Uplift Capacity for Underreamed Piers

Based on an expression reported by Terzaghi, Peck, and Mesri<sup>3</sup>, the ultimate capacity of underreamed footings to resist uplift loads in clays can be estimated from the following equation which is a general form of the expression when the ratio of footing depth to bell diameter exceeds a value of 2.0:

$$Q_u = 5.5 c_u (D^2 - d^2) + W$$

Where:  $Q_u$  = ultimate uplift capacity, pounds

$c_u$  = average soil shear strength above the footing grade  
(Use  $c_u = 2,000$  psf)

D = underream diameter, feet.

d = shaft diameter, feet.

W = Dead weight of Pier

A minimum factor of safety of FS~2.0 is recommended for the final design and should be applied to  $Q_u$ .

### 2.2 Structural Floor with Crawl Space and Deep Foundations

For the proposed building, piers can be used to support a structural floor with an underlying crawl space. Due to the presence of expansive soil, the piers should support grade beams to increase the rigidity of the foundation system for resisting potential differential movement associated with changes in soil moisture content. Concrete pedestals can be supported on grade beams at pier locations to support beams for a structural floor system or a wall may be placed on grade beams to support a structural floor system. Termite shields can be used to protect structural wood floor systems. The site and crawl space grading and drainage should ensure that water does not collect in the crawl space. Roots should not be permitted in the crawl space area due to associated soil shrinkage. Below-floor plumbing should be protected from freezing.

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<sup>3</sup> Soil Mechanics in Engineering Practice, Wiley Interscience, third edition

### 2.3 Slab-on-Grade Foundation

Proposed educational buildings at this site can be supported on a foundation system 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 **42-inches** of structural select fill materials having a Liquid Limit less than 35 percent and a Plasticity Index (PI) between 10 & 20 are strongly advised for placement 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 at least **2½ -feet** below the final soil grade supported on an improved subgrade soil as explained above. The recommended design parameters are summarized below:

Bearing Capacity:	Dead Load Only:	2,500 psf
	Total (Dead and Live):	3,000 psf

The foundation slab designed in accordance with the above capacity values will have a factor of safety FS~3.0 and 2.0 with respect to shearing failure for dead and total loading respectively. Footing weight below the final grade can be neglected in the determination of design loading.

A bedding layer of leveling sand, a 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 detect any soft or loose zones. The proof-rolling operations should be observed by an experienced technician.

In regions where soft soils are located from the proof roll, undercut at least **4-feet** of existing soil, process, 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 a 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 -1% to +3% optimum moisture.

Information was not available on whether fill will be used to raise the 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 eight-inch thickness. In the floor slab, subgrade soils should be compacted to a minimum of 95% of the standard proctor Density Test (ASTM D698) at moisture content within -1% to + 3 % of optimum moisture. Tree stumps, if present, should be removed below floor slab grade and backfilled with structural select fill materials.

## 2.4 Spread Footings

Spread Footing systems may also be considered based on the soil condition revealed by the field soil test borings, and the structure at this site can be supported on a foundation system comprising shallow spread footings. The footings should bear at a depth of 4½-feet below the existing grade and be supported on very stiff to hard fat clay.

The spread foundation design parameters are summarized below for a footing with a width that equals or exceeds **3-feet**. The spread foundation design parameters are summarized below:

Due to the soil characteristics at this site, at least 42-inches of structural select fill materials having a Liquid Limit less than 35 percent and a Plasticity Index (PI) between 10 & 20 are strongly advised for placement 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.

In the regions where soft and moist soils are located from the proof roll, undercut at least 4-feet of existing soil, process, and replace in a maximum of 8-inch loose lifts and compact 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.

Allowable Bearing Capacity for Square Footing:

Dead Load Only:	3,000 psf
Total (dead and live):	3,250 psf

The Foundation slab designed in accordance with the above capacity values will have a factor of safety of FS~3.0 and 2.0 with respect to shearing failure for dead and total loading respectively.

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 the 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) on the same day as excavation. The sides of the excavation should be removed prior to steel placement. If for some reason the footing cannot be cast on the same day of excavation, a sealed 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 sacks 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, architects, or owner's representatives. 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 if support soil is eroded, a foundation failure could occur. The footing should be designed to provide proper support for the proposed *structures*, associated with differential movements, which may occur due to changes in the support soil's moisture contents.

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## V. DETENTION POND RECOMMENDATION (Based on Soil Borings B-7 and B-8)

As mentioned earlier, based on the obtained information the detention pond is along the north of the building and is proposed to be approximately 6-feet deep with a dry-bottom. The soil borings B-7 and B-8, drilled for the proposed detention pond, indicate a consistent stratigraphy from the ground surface to the termination depth of 10-feet of high plasticity fat clays encountered.

Please note that GETI observed NO groundwater at the detention pond area as well as neighboring borings, during drilling operations. The detailed and long-term groundwater table can be monitored by placing a piezometer at the detention pond location, which is beyond the scope of this report. Should the dewatering be required on-site at the time of construction, sumps, and/or pumps should be utilized.

### 5.1 Seepage and Liner Requirements

The generalized stratigraphy of the site reveals interspersing strata of very high plasticity fat clay soils, through which seepage of water is not critical.

The Harris County Flood Control District Specification (HCFCD) No. 02314 states that medium to high plasticity sandy lean clay with sand and sandy lean clay (CL) with Liquid Limit (LL) less than 49 percent Plasticity Index (PI) between 15 to 30, & soil % passing through the No. 200 sieve in between 60 to 85 can be used as clay liner. Additionally, these soils must be non-dispersive.

***The encountered fat clays obtained in the borings B-7 and B-8, with a Liquid Limit (LL) between 60 to 70, Plasticity Index (PI) between 36 to 43, soil passing through number 200 between 94 to 98 percent, and non-dispersive due to the conducted crumb tests, are satisfactory to be used as clay liners.***

In areas where clay liners are required due to the encounter of sand pockets or calcareous pockets during construction, the liner should have a minimum thickness of 24-inches and should be compacted in 6-inches lifts, with the compaction of each lift meeting or exceeding 95% of the standard proctor density (ASTM D 698) at a moisture content +1 to +3 percentage points above optimum moisture content.

The clay liner should be free of sod, brush, roots, or other perishable materials. Site drainage and erosion control systems should be designed and constructed to ensure that the functionality of the clay liner is not compromised.

Slope stability is beyond the scope of this report. However, an embankment slope of 4H:1V should be satisfactory for encountered fat clays. This slope allows for vegetation growth and maintenance.

It is recommended that the site drainage be well developed to prevent erosion of the soil. A swale with stormwater interceptors can be constructed at intermittent distances along the pond perimeter to collect water around the pond and reduce stormwater runoff over the pond embankment. The collected water should then be diverted to the pond with outfall pipes, so that the erosion of the pond slope is minimized, and the integrity of the pond bank is maintained.

**VI. PAVEMENT RECOMMENDATIONS  
 (Based on Soil Borings B-5, B-6, and B-9)**

Based on our field investigation and test results in the borings at the proposed project, the surficial soils are very high plastic fat clays. Therefore, these surface soils can be easily handled, retain compaction, and minimize or eliminate rutting if stabilized.

**1. Parking Lots and Access Driveways for Light and Medium Vehicles**

Depending upon the characteristic traffic for the pavement system, GETI recommends the upper 6-inches of the exposed fat clay final subgrade be stabilized by the addition of 7% 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.

*Please consider the site preparation recommendations which are provided in the following sections.*

The required quantity of lime for use in stabilization as provided above is an estimated value only. 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 at the time of construction.

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 Items 260 and 264, should be used as a procedural guide for lime treatment of the subgrade soils.*

The assumptions utilized in our pavement thickness analysis are summarized on Plate No. 12. 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. 13. It is estimated that the service life for a properly constructed and maintained pavement will be in the order of 20 years. Proper civil design features such as joint design and 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 Grade 60 No. 3 bar placed at 15-inches in the center in each direction. Control joints should be placed 15-ft. in the center, and expansion joints should not exceed 60 ft. in the center.

<b>Automobile Only (DI-1)</b>	<b>Flexible Base</b>	<b>Rigid Pavement</b>
Daily EAL 5 or less	3.0" 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</b> <b>Access Lanes</b> <b>(DI-2)</b> Daily EAL 6 to 20	Flexible Base	Rigid Pavement
	3.0" 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</b> <b>Access Drives</b> <b>(DI-3)</b> Daily EAL 21 to 75	Flexible Base	Rigid Pavement
	3.0" Hot Mix Asphaltic Concrete	8.0" Reinforced Concrete
	8.0" Crushed Limestone	8.0" Stabilized Compacted Subgrade
	8.0" Stabilized Compacted Subgrade	

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## VII. GENERAL CONSTRUCTION CONSIDERATIONS

### 1. Site Preparation

- 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  $\frac{1}{2}$ -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 a higher amount of fill, the select fill soils should extend beyond the edge of the structure to equal the height of the 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 detect any soft or loose zones. Any soil 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 ensure 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 have been completed prior to the concrete placement.

## 2. Structural Fill and Subgrade Preparation

It is recommended that the subgrade and fill be prepared as follows:

- 2.1 The site should be stripped to a suitable depth to remove any topsoil 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 soil 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 a Liquid Limit (LL) of 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 a maximum of 8-inches loose lifts and compacted to a minimum of 95 percent of the maximum dry density as per ASTM D698. The moisture content should be -1% to +3% 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 soil 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 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 from the foundation). No ponding of surface water should be allowed near the structure. The following drainage precautions should always be observed during construction and after the structure has been completed.

- 3.1 The backfill around the structure should be a cohesive soil material that 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.

- 3.2 Where landscaping is to be installed next to the perimeter of the grade beam, a moisture barrier or other suitable means should be installed to prevent moisture from entering the underlying clay soils.
- 3.3 Roof downspouts and drains should discharge well away from the limits of the foundation or grade beams.

#### **4. Vegetation Control**

We recommend trees not 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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### **VIII. 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 any given year).

Site development engineering firms provide services for site drainage and assuring compliance with floor elevations defined by standards for the 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 – This 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 the 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 to not impede the flow of water.

In other flood risk regions, 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 low flood risk, permits may be obtained for Grade-Supported Stiffened Non-Structural Slabs, Stiffened Non-Structural Slabs with Deep Foundations, Structural Slabs with Void Space and Deep Foundations, and other types of shallow foundation systems.



## IX. DISCLAIMER

The information and recommendation contained in the report summarized conditions found at the site of the proposed development for the Fort Bend County Elections Administration Facility located northwest of Bamore Road and Klaycke Road 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 from those presented in this report, GETI should be notified immediately.

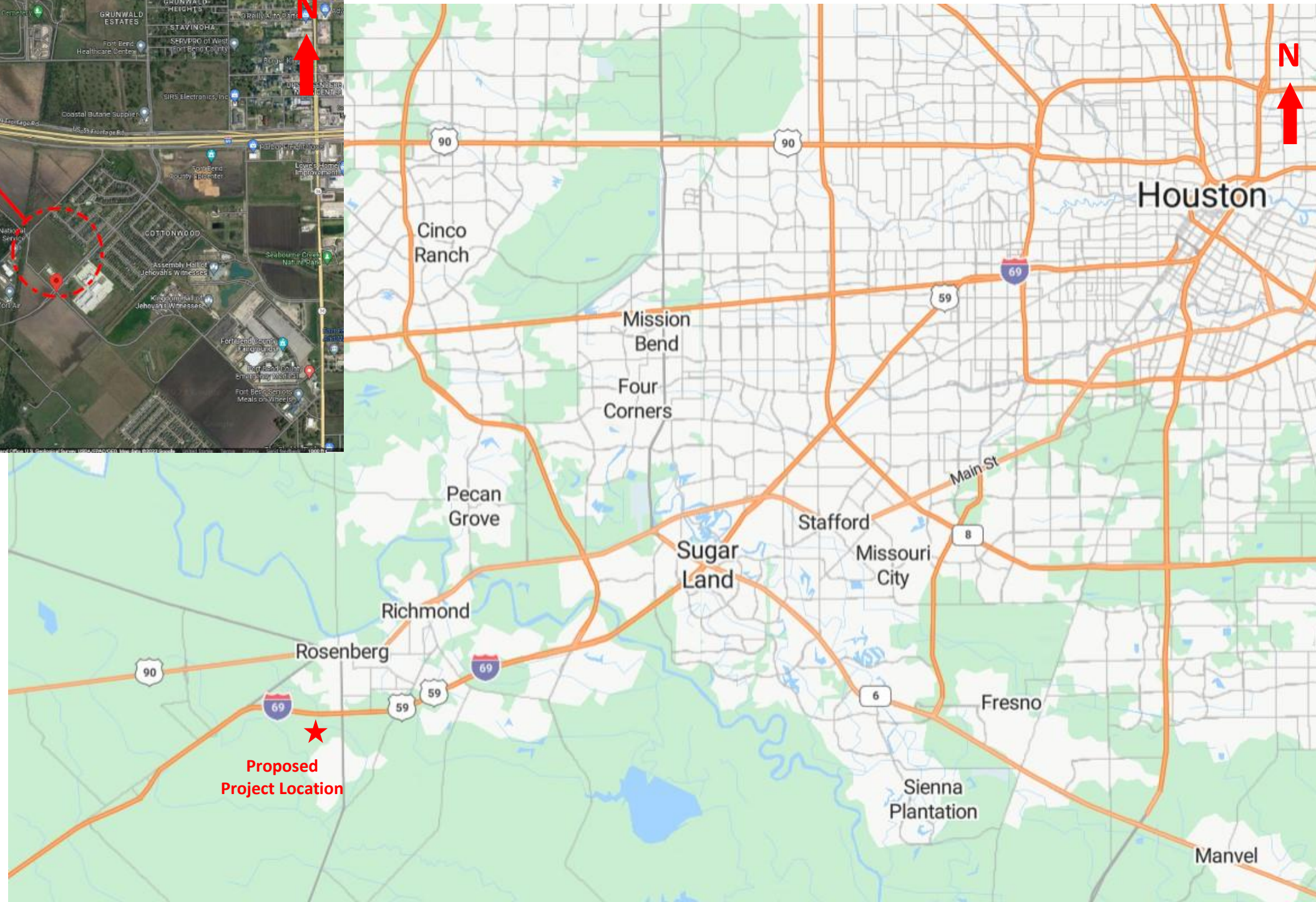
The report was prepared for the sole and exclusive use of our client, based on specific and limited objectives. All reports, boring logs, field data, laboratory test results, and other documents prepared by GETI as instruments of service shall remain the property of GETI. Reuse of these documents is not permitted without written approval by GETI. GETI 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 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 services to complete this project. The following illustrations are attached and complete this report:

ILLUSTRATIONS	PLATE NUMBERS
Vicinity Map and Boring Locations Plan	1a-1b
Boring Logs	2-10
Symbols and Terms Used on Boring Logs	11
Assumptions for Pavement Analysis	12
Pavement Material Recommendations	13
Site Pictures	14



Site Vicinity Map

**Proposed Fort Bend County Elections Administration Facility  
 Building, Pavement, and Detention Pond Recommendation  
 Northwest of Bamore Road and Klaycke Road  
 Rosenberg, Texas  
 GETI NO: 23G12413**



Site Map and Boring Locations

**Proposed Fort Bend County Elections Administration Facility  
Building, Pavement, and Detention Pond Recommendation  
Northwest of Bamore Road and Klaycke Road  
Rosenberg, Texas  
GETI NO: 23G12413**

**PROJECT: Fort Bend County Elections Administration Facility**  
 Building, Pavement & Detention Pond  
 Northwest of Bamore Road & Klaycke Road  
 Rosenberg, Texas

**CLIENT: Fort Bend County**  
 Richmond, Texas

BORING NO.: **B-1** DEPTH: **25'**  
 PROJECT NO. 23G12413 DATE December 6, 2023  
 Drilling Crew: GXP  
 Drilling Type: Truck/Trailer Mounted Rig w/ 3-inch Sampler

Water was **NOT** encountered during drilling operation

**GPS Coordinates: 29.525173 N, -95.824155 W**

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)	Continuous Flight Auger & Intermittent Sampling
									LL	PL	PI			
0			P=0.75				25		71	27	44			Dark gray FAT CLAY with ferrous stains (CH) - firm from 0 to 2' - stiff from 2' to 4'
1			P=1.75				25							
5			P=4.0+				18							Reddish brown FAT CLAY with ferrous stains and scattered calcareous nodules (CH) - very stiff to hard from 4' to 8' - very stiff from 8' to 10' - very stiff to hard from 10' to 12' - very stiff, with silty seams from 13' to 15' - very stiff to hard from 18' to 20' - very stiff to hard from 23' to 25'
6			P=4.0+				19							
8			P=3.75				21		68	26	42			
10			P=4.0+				16							
13			P=3.25				18	104	68	26	42	99	1.85	
18			P=4.0+				19							
23			P=4.0+				20		68	26	42			
25														

**Legend**

Fat Clay		Sandy Clay / Silty Clay		Silty Sand / Sandy Silt	
Fill		Clayey Sand		Silty Clayey Sand	

**DESCRIPTION OF STRATUM**

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. 2**

<b>PROJECT: Fort Bend County Elections Administration Facility</b> Building, Pavement & Detention Pond Northwest of Bamore Road & Klaycke Road Rosenberg, Texas  <b>CLIENT: Fort Bend County</b> Richmond, Texas	BORING NO.: <b>B-2</b> DEPTH: <b>25'</b> PROJECT NO.: 23G12413      DATE: December 6, 2023 Drilling Crew: GXP Drilling Type: Truck/Trailer Mounted Rig w/ 3-inch Sampler  Water was <b>NOT</b> encountered during drilling operation  <b>GPS Coordinates: 29.525168 N, -95.824408 W</b>
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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)	Continuous Flight Auger & Intermittent Sampling
									LL	PL	PI			
0 - 5			P=1.75				23							<b>Legend</b> Fat Clay:  Lean Clay / Silty Clay:  Silty Sand / Sandy Silt: Fill:  Clayey Sand:  Silty Clayey Sand:
5 - 10			P=2.5				20	59	24	35			<b>DESCRIPTION OF STRATUM</b> Dark gray FAT CLAY with ferrous stains (CH) - stiff from 0 to 2' - very stiff from 2' to 4'  - very stiff to hard from 4' to 8'  Very stiff to hard, reddish brown and light brown FAT CLAY with ferrous stains and calcareous nodules (CH) - with heavy calcareous nodules from 10' to 15'  - with silty seams from 23' to 25'	
10 - 15			P=4.0+				19							
15 - 20			P=4.0+				17	70	27	43				
20 - 25			P=4.0+				17	64	25	39		3.20		
25 - 30			P=4.0+				19	106						
30 - 35			P=4.0+				18							

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. 3</b>
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<b>PROJECT: Fort Bend County Elections Administration Facility</b> Building, Pavement & Detention Pond Northwest of Bamore Road & Klaycke Road Rosenberg, Texas  <b>CLIENT: Fort Bend County</b> Richmond, Texas	BORING NO.: <b>B-3</b> DEPTH: <b>25'</b> PROJECT NO. 23G12413                  DATE December 6, 2023 Drilling Crew: GXP Drilling Type: Truck/Trailer Mounted Rig w/ 3-inch Sampler  Water was encountered during drilling operation  <b>GPS Coordinates: 29.525650 N, -95.824741 W</b>
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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)	Continuous Flight Auger & Intermittent Sampling
									LL	PL	PI			
5	[Red Vertical Stripes]	[Red Vertical Stripes]	P=4.0+				20		75	28	47			Legend Fat Clay [Red Vertical Stripes]    Lean Clay / Silty Clay [Blue Grid]    Silty Sand / Sandy Silt [Green Grid] Fill [Purple Grid]    Clayey Sand [Yellow Grid]    Silty Clayey Sand [Blue Grid]
			P=3.25				18						DESCRIPTION OF STRATUM Dark gray FAT CLAY with ferrous stains (CH) - very stiff to hard from 0 to 2' - very stiff from 2' to 4'  - very stiff to hard from 4' to 6'	
			P=4.0+				20							
10	[Red Vertical Stripes]	[Red Vertical Stripes]	P=4.0+				19		69	27	42			Reddish brown FAT CLAY with ferrous stains and scattered calcareous nodules (CH) - very stiff to hard from 6' to 8' - with calcareous nodules from 8' to 10' - very stiff from 8' to 12'  - stiff to very stiff, and with silt from 13' to 15'
			P=3.5				16							
			P=3.0				18							
15	[Red Vertical Stripes]	[Red Vertical Stripes]	P=2.0				13	111				0.80		
20	[Green Vertical Stripes]	[Red Vertical Stripes]	P=0.75				20		40	16	24	42		Reddish brown CLAYEY SAND (SC) - firm from 18' to 20'  - stiff from 23' to 25'
25			P=1.25				23							

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. 4</b>
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<b>PROJECT: Fort Bend County Elections Administration Facility</b> Building, Pavement & Detention Pond Northwest of Bamore Road & Klaycke Road Rosenberg, Texas  <b>CLIENT: Fort Bend County</b> Richmond, Texas	BORING NO.: <b>B-4</b> DEPTH: <b>25'</b> PROJECT NO. 23G12413      DATE December 6, 2023 Drilling Crew: GXP Drilling Type: Truck/Trailer Mounted Rig w/ 3-inch Sampler  Water was <b>NOT</b> encountered during drilling operation  <b>GPS Coordinates: 29.525567 N, -95.824980 W</b>
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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)	Continuous Flight Auger & Intermittent Sampling
									LL	PL	PI			
5	FAT CLAY		P=4.0+				19		70	27	43			Dark gray FAT CLAY with ferrous stains (CH) - very stiff to hard from 0 to 4'  - very stiff from 4' to 6'
			P=4.0+				18							
				P=3.5				21		62	25	37		
10				P=3.25				21						Reddish brown FAT CLAY with ferrous stains and scattered calcareous nodules (CH) - very stiff to hard from 8' to 10' - with heavy calcareous nodules from 8' to 10' - stiff to very stiff from 10' to 12'  - very stiff, and heavy calcareous seams from 13' to 15'  - very stiff from 18' to 25'
				P=4.0+				15						
				P=2.0				17						
15				P=2.5				21	102				1.50	
20			P=2.75				21		58	24	34			
25			P=2.75				22							

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. 5</b>
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<b>PROJECT: Fort Bend County Elections Administration Facility</b> Building, Pavement & Detention Pond Northwest of Bamore Road & Klaycke Road Rosenberg, Texas  <b>CLIENT: Fort Bend County</b> Richmond, Texas	BORING NO.: <b>B-5</b> DEPTH: <b>6'</b> PROJECT NO. 23G12413      DATE December 6, 2023 Drilling Crew: GXP Drilling Type: Truck/Trailer Mounted Rig w/ 3-inch Sampler
Water was <b>NOT</b> encountered during drilling operation	
<b>GPS Coordinates: 29.524856 N, -95.824500 W</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)	DESCRIPTION OF STRATUM
									LL	PL	PI			
5			P=1.25				27		79	29	50			<b>Continuous Flight Auger &amp; Intermittent Sampling</b>  <div style="text-align: center;"> <b>Legend</b>  </div> Dark gray FAT CLAY with ferrous stains (CH) - stiff from 0 to 2' - stiff to very stiff from 2' to 4' - very stiff to hard from 4' to 6'
			P=2.0				26							
			P=4.0+				19		66	26	40			
10														
15														
20														
25														



<b>PROJECT: Fort Bend County Elections Administration Facility</b> Building, Pavement & Detention Pond Northwest of Bamore Road & Klaycke Road Rosenberg, Texas  <b>CLIENT: Fort Bend County</b> Richmond, Texas	BORING NO.: <b>B-5</b> DEPTH: <b>6'</b> PROJECT NO. 23G12413      DATE December 6, 2023 Drilling Crew: GXP Drilling Type: Truck/Trailer Mounted Rig w/ 3-inch Sampler
Water was <b>NOT</b> encountered during drilling operation	
<b>GPS Coordinates: 29.524918 N, -95.824006 W</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)	Continuous Flight Auger & Intermittent Sampling
									LL	PL	PI			
5			P=2.25				20		84	31	53			Legend <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  Fat Clay         </div> <div style="text-align: center;">  Lean Clay / Silty Clay         </div> <div style="text-align: center;">  Silty Sand / Sandy Silt         </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-top: 10px;"> <div style="text-align: center;">  Fill         </div> <div style="text-align: center;">  Clayey Sand         </div> <div style="text-align: center;">  Silty Clayey Sand         </div> </div>
			P=2.5				28							
			P=3.5				20		75	28	47			
10														<b>DESCRIPTION OF STRATUM</b>  Very stiff, dark gray FAT CLAY with ferrous stains (CH)
15														
20														
25														
30														

**PROJECT: Fort Bend County Elections Administration Facility**  
 Building, Pavement & Detention Pond  
 Northwest of Bamore Road & Klaycke Road  
 Rosenberg, Texas

**CLIENT: Fort Bend County**  
 Richmond, Texas

BORING NO.: **B-7** DEPTH: **10'**  
 PROJECT NO. 23G12413 DATE December 6, 2023  
 Drilling Crew: GXP  
 Drilling Type: Truck/Trailer Mounted Rig w/ 3-inch Sampler

Water was **NOT** encountered during drilling operation

**GPS Coordinates: 29.525533 N, -95.824110 W**

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)	DESCRIPTION OF STRATUM
									LL	PL	PI			
5			P=4.0+				19		70	27	43	95		Very stiff to hard, dark gray FAT CLAY with ferrous (CH)
			P=4.0+				19							
			P=4.0+				17							
			P=4.0+				19		67	26	41	95		
10			P=3.25				22							Very stiff, reddish brown FAT CLAY with ferrous stains and scattered calcaereous nodules (CH)
15														
20														
25														

**Legend**

Fat Clay		Lean Clay / Silty Clay		Silty Sand / Sandy Silt	
Fill		Clayey Sand		Silty Clayey Sand	







**PROJECT: Fort Bend County Elections Administration Facility**  
 Building, Pavement & Detention Pond  
 Northwest of Bamore Road & Klaycke Road  
 Rosenberg, Texas

**CLIENT: Fort Bend County**  
 Richmond, Texas

BORING NO.: **B-8** DEPTH: **10'**  
 PROJECT NO. 23G12413 DATE December 6, 2023  
 Drilling Crew: GXP  
 Drilling Type: Truck/Trailer Mounted Rig w/ 3-inch Sampler

Water was **NOT** encountered during drilling operation

**GPS Coordinates: 29.525944 N, -95.824616 W**

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	ATTEBERG LIMITS (%)			MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TSF)	Continuous Flight Auger & Intermittent Sampling
									LL	PL	PI			
0			P=3.5				16		60	24	36	94		<p><b>Legend</b></p> <p>Fat Clay  Lean Clay / Silty Clay  Silty Sand / Sandy Silt </p> <p>Fill  Clayey Sand  Silty Clayey Sand </p>
3			P=3.75				19							
4			P=4.0+				16		65	26	39			
5			P=4.0+				17							
10			P=3.0				25		63	25	38	98		Very stiff, reddish brown FAT CLAY with ferrous stains and scattered calcaureous nodules (CH)
15														
20														
25														

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. 9**

**PROJECT: Fort Bend County Elections Administration Facility**  
 Building, Pavement & Detention Pond  
 Northwest of Bamore Road & Klaycke Road  
 Rosenberg, Texas

**CLIENT: Fort Bend County**  
 Richmond, Texas

BORING NO.: **B-9** DEPTH: **10'**  
 PROJECT NO. 23G12413 DATE December 6, 2023  
 Drilling Crew: GXP  
 Drilling Type: Truck/Trailer Mounted Rig w/ 3-inch Sampler







Water was **NOT** encountered during drilling operation

**GPS Coordinates: 29.524961 N, -95.824923 W**

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	ATTEBERG LIMITS (%)			MINIUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TSF)	DESCRIPTION OF STRATUM
									LL	PL	PI			
5			P=4.0+				15		62	25	37			Very stiff to hard, dark gray FAT CLAY with ferrous (CH)
			P=4.0+				17							
			P=4.0+				18							
			P=4.0+				20	71	27	44				
10			P=3.0				22							Very stiff, reddish brown FAT CLAY with ferrous stains and scattered calcaereous nodules (CH)
15														
20														
25														

**Continuous Flight Auger & Intermittent Sampling**

**Legend**


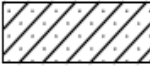

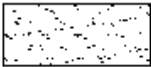
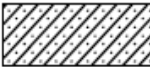



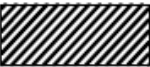
Fat Clay		Lean Clay / Silty Clay		Silty Sand / Sandy Silt	
Fill		Clayey Sand		Silty Clayey Sand	

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. 10**

## 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	SLS - Failure surface occurring along slickensided plane
S - Shear	SAS - Failure surface occurring along or in sand seam
M/S - Multiple Shear	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 of 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 of two-axle trucks or 1 percent of 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)

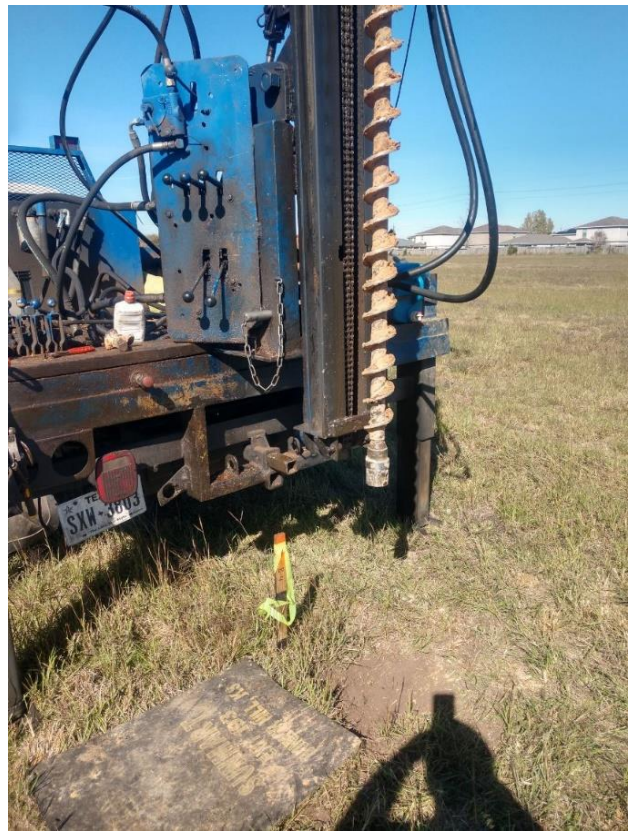
3.02 Modulus of rupture: 500 psi at 7 days  
(concrete)

PLATE NO.: 12

## 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 criterion. The mixture shall contain 3 to 5 percent entrained air.

PLATE NO.: 13



Project No.: 23G12413  
PLATE NO.: 14



**SECTION 01 10 00**  
**SUMMARY**

**PART 1 - GENERAL**

**1.01 SUMMARY**

A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Owner-furnished products.
4. Access to site.
5. Work restrictions.
6. Specification and Drawing conventions.

B. Related Sections include:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

**1.02 PROJECT INFORMATION**

A. Project Identification: FBC Elections Administration Building, Project Number 2330.

1. Project Location: Rosenberg, Texas.

B. Owner: Fort Bend County, Suite 301 Jackson Street, Richmond, Texas 77469.

1. Owner's Representative: James Knight.

C. Architect: Collaborate Architects.

1. Address: 1206 Nance Street, Houston, Texas 77002.
2. Contact: Dwayne Mollard, AIA.
3. See Section 013100 "Project Management and Coordination." for requirements for establishing and using web-based Project software.

**1.03 WORK COVERED BY CONTRACT DOCUMENTS**

- A. The Work of Project is defined by the Contract Documents and consists of a new construction single-story commercial building with approximately 48,000 square feet of floor area, and other Work indicated in the Contract Documents.
- B. Type of Contract: Project will be constructed under a single prime contract.

**1.04 OWNER-FURNISHED PRODUCTS**

- A. Owner will furnish products indicated. The Work includes receiving, unloading, handling, storing, protecting, and installing Owner-furnished products and making building services connections.
- B. Owner-Furnished Products:
  - 1. Paper Towel Dispenser.
  - 2. Soap Dispenser.
  - 3. Waste Receptacle.

**1.05 ACCESS TO SITE**

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Use of Site: Limit use of Project site to Work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

**1.06 WORK RESTRICTIONS**

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours permitted by authorities having jurisdiction.
- C. Restricted Substances: Use of tobacco products and other controlled substances on Project site is not permitted.
- D. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

## **1.07 SPECIFICATION AND DRAWING CONVENTIONS**

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings and published as part of the U.S. National CAD Standard.
  3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

## **PART 2 - PRODUCTS (NOT APPLICABLE)**

## **PART 3 - EXECUTION (NOT APPLICABLE)**

**END OF SECTION**

**SECTION 01 21 00**  
**ALLOWANCES**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include lump-sum allowances.

**1.02 DEFINITIONS**

- A. Allowance is a quantity of work or dollar amount established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

**1.03 SELECTION AND PURCHASE**

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

**1.04 ACTION SUBMITTALS**

- A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

**1.05 INFORMATIONAL SUBMITTALS**

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

#### **1.06 LUMP-SUM ALLOWANCES**

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, 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 or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

#### **1.07 ADJUSTMENT OF ALLOWANCES**

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
  - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
  - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
- 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.
  - 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has changed from what could have been foreseen from information in the Contract Documents.
  - 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

### **PART 2 - PRODUCTS (NOT USED)**

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**ALLOWANCES**

01 21 00 - 2

Issued for Bid and Permit - 1/17/2024

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

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

#### **3.02 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.

#### **3.03 SCHEDULE OF ALLOWANCES**

- A. Allowance No. 1: Interior and Exterior Signage Allowance: Include a sum of twenty-five thousand dollars (\$25,000.00) to be used for the cost of purchasing, delivering, and installing the interior and exterior panel signage, including exterior cast letters in the Project.
- B. Allowance No. 2: Drilled Piers Allowance: At locations where the underreamed foundation piers crumble, install pier width to 18 feet depth below finish floor as indicated on Structural drawings. Include a sum of forty thousand dollars (\$40,000.00) to be used for the cost of extending the depth of foundation piers.
- C. Allowance No. 3: Miscellaneous Steel Allowance: Include a sum of fifty-five thousand dollars (\$55,000.00) to be used for the cost of purchasing miscellaneous steel items.

**END OF SECTION**

**SECTION 01 25 00**  
**SUBSTITUTION PROCEDURES**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Sections include Division 01 Section "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

**1.02 DEFINITIONS**

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

**1.03 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. Substitution Request Form: Use form attached.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
    - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    - e. Samples, where applicable or requested.
    - f. Certificates and qualification data, where applicable or requested.
    - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.

- h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
  - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
  - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
  - k. Cost information, including a proposal of change, if any, in the Contract Sum.
  - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
  - m. 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.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
  - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

#### **1.04 QUALITY ASSURANCE**

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturers.

### **PART 2 - PRODUCTS**

#### **2.01 SUBSTITUTIONS**

- A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
  - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:



- a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  - b. Requested substitution will not adversely affect Contractor's construction schedule.
  - c. Requested substitution has received necessary approvals of authorities having jurisdiction.
  - d. Requested substitution is compatible with other portions of the Work.
  - e. Requested substitution has been coordinated with other portions of the Work.
  - f. Requested substitution provides specified warranty.
  - g. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after the Notice to Proceed.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
    - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
    - b. Requested substitution does not require extensive revisions to the Contract Documents.
    - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    - d. Requested substitution will not adversely affect Contractor's construction schedule.
    - e. Requested substitution has received necessary approvals of authorities having jurisdiction.
    - f. Requested substitution is compatible with other portions of the Work.
    - g. Requested substitution has been coordinated with other portions of the Work.
    - h. Requested substitution provides specified warranty.
    - i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

### **PART 3 - EXECUTION (NOT APPLICABLE)**

**END OF SECTION**

**SUBSTITUTION REQUEST FORM**

**(ATTACH ADDITIONAL PAGES AS NECESSARY)**

A. From (Print Name of Contractor): \_\_\_\_\_

Date of Request: \_\_\_\_\_

B. Project Name: \_\_\_\_\_

1. Location: \_\_\_\_\_.

2. Architect's Project No.: \_\_\_\_\_

C. References:

1. Specification Section: \_\_\_\_\_

a. Part: \_\_\_\_\_ Article: \_\_\_\_\_

b. Paragraph: \_\_\_\_\_ Subparagraph: \_\_\_\_\_

2. Drawing Sheet(s): Detail(s): \_\_\_\_\_

3. Specified Product Name: Model No.: \_\_\_\_\_

D. Description of Proposed Substitution:

1. Substitute Product Name: \_\_\_\_\_

2. Substitute Product Model No.: \_\_\_\_\_

3. Manufacturer Name: \_\_\_\_\_

a. Address: \_\_\_\_\_

b. Phone: \_\_\_\_\_

4. Installer Name: \_\_\_\_\_

a. Address: \_\_\_\_\_

b. Phone: \_\_\_\_\_

5. Reason for not providing specified item: \_\_\_\_\_

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

6. Differences between proposed substitution and specified product:

- Point-by-point comparative data attached (Required for analysis and review by Architect)
- Coordination information attached (Required for analysis and review by Architect)

7. Substitution Product History:  New Product       2 to 5 Years Old  
 5 to 10 Years Old       More than 10 Years Old

8. Similar Installations of Proposed Product:

a. Project Name: \_\_\_\_\_

Project Address: \_\_\_\_\_

Architect: \_\_\_\_\_

Phone: \_\_\_\_\_

b. Owner Name: \_\_\_\_\_

Phone: \_\_\_\_\_

c. Date Product Installed: \_\_\_\_\_

E. Effect of Proposed Substitution:

1. Acceptance of proposed substitute will require the following change in Contract Sum and Contract Time:

- a.  No Change in Contract Sum
- Increase Contract Sum by \$ \_\_\_\_\_
- Decrease Contract Sum by \$ \_\_\_\_\_
- b.  No Change in Contract Time
- Increase Contract Time by \_\_\_\_\_ Calendar Days
- Decrease Contract Time by \_\_\_\_\_ Calendar Days

2. Effect of proposed request for substitution on the following (attach additional sheets if necessary):

a. Change in Construction Progress Schedule:  
 No Effect  Yes, Explain: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

b. Changes required in details and construction of related work:  
 No Effect  Yes, Explain: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
c. Change in warranty requirements:  
 No Effect  Yes, Explain: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. Representations by Contractor:

- a. Substitute item is equivalent or superior to that specified in quality and durability, design, appearance, function, finish, performance, is of size and weight that will permit installation in spaces provided, and that will allow adequate service access;
- b. Substitute item is compatible with other portions of the Work;
- c. Substitute item has been coordinated with other portions of the Work;
- d. Substitute item has received necessary approvals from authorities having jurisdiction;
- e. Substitute item is consistent with the Contract Documents and will produce the intended results;
- f. Substitute item provides specified warranty; and
- g. If requested substitution involves more than one contractor, or subcontractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors, or subcontractors involved.

F. Contractor: \_\_\_\_\_

1. Signature: \_\_\_\_\_

Date: \_\_\_\_\_

2. Name (Type or Print): \_\_\_\_\_

3. Title: \_\_\_\_\_

G. Architect: \_\_\_\_\_

1. Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Name (Type or Print): \_\_\_\_\_

2. Title: \_\_\_\_\_

H. Owner: \_\_\_\_\_

1. Signature: \_\_\_\_\_

Date: \_\_\_\_\_

2. Name (Type or Print): \_\_\_\_\_

3. Title: \_\_\_\_\_

**END OF SECTION**

**SECTION 01 26 00**  
**CONTRACT MODIFICATION PROCEDURES**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

**1.02 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."

**1.03 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 not instructions either to stop work in progress or to execute the proposed change.
  2. Within time specified in Proposal Request or 20 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include costs of labor and supervision directly attributable to the change.
    - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
    - e. Quotation Form: Use forms acceptable to Architect.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 01 Section "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use form acceptable to Architect.

#### **1.04 ADMINISTRATIVE CHANGE ORDERS**

- A. Allowance Adjustment: Refer to Division 01 Section "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.

#### **1.05 CHANGE ORDER PROCEDURES**

- A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

#### **1.06 CONSTRUCTION CHANGE DIRECTIVE**

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
  1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
  1. 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**



**SECTION 01 29 00**  
**PAYMENT PROCEDURES**

**1.01 SUMMARY**

- A. Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

**1.02 SCHEDULE OF VALUES**

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
  - 1. Correlate line items in the schedule of values with other required administrative forms and schedules, including the following:
    - a. Application for Payment forms with continuation sheets.
    - b. Submittal schedule.
    - c. Items required to be indicated as separate activities in Contractor's construction schedule.
  - 2. 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.
  - 3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.
- B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
  - 1. Identification: Include the following Project identification on the schedule of values:
    - a. Project name and location.
    - b. Name of Architect.
    - c. Architect's project number.
    - d. Contractor's name and address.
    - e. Date of submittal.
  - 2. Arrange schedule of values consistent with format of AIA Document G703.
  - 3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the

Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of two percent of Contract Sum.

- a. Include separate line items under principal subcontracts for project closeout requirements in an amount totaling two percent of the Contract Sum and subcontract amount.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
6. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Unless otherwise indicated in the Agreement, include line item for 10 percent retainage.
8. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
  - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
9. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

### **1.03 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.
  1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
  1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.

2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
  2. When an application shows completion of an item, submit conditional final or full waivers.
  3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
  4. Waiver Forms: 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.
  5. Submittal schedule (preliminary if not final).
  6. List of Contractor's staff assignments.
  7. List of Contractor's principal consultants.
  8. Copies of building permits.
  9. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
  10. Initial progress report.
  11. Report of preconstruction conference.
  12. Certificates of insurance and insurance policies.
- 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.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
  2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

- 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. AIA Document G706-1994, "Contractor's Affidavit of Payment of Debts and Claims."
  5. AIA Document G706A-1994, "Contractor's Affidavit of Release of Liens."
  6. AIA Document G707-1994, "Consent of Surety to Final Payment."
  7. Evidence that claims have been settled.
  8. 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.
  9. Final liquidated damages settlement statement.

**PART 2 - PRODUCTS (NOT APPLICABLE)**

**PART 3 - EXECUTION (NOT APPLICABLE)**

**END OF SECTION**

**SECTION 01 31 00**  
**PROJECT MANAGEMENT AND COORDINATION**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. General coordination procedures.
  - 2. Coordination drawings.
  - 3. RFIs.
  - 4. Digital project management procedures.
  - 5. Project meetings including:
    - a. Preconstruction conference.
    - b. Progress meetings.
    - c. Preinstallation conferences.
    - d. Project closeout conference.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Sections include:
  - 1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
  - 2. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
  - 3. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

**1.02 DEFINITIONS**

- A. RFI: Request for Information. Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
  2. Number and title of related Specification Section(s) covered by subcontract.
  3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
1. Post copies of list in project meeting room, in temporary field office, in web-based Project software directory, and in prominent location in built facility. Keep list current at all times.

#### **1.04 GENERAL COORDINATION PROCEDURES**

- 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. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's construction schedule.
  2. Preparation of the schedule of values.
  3. Installation and removal of temporary facilities and controls.
  4. Delivery and processing of submittals.
  5. Progress meetings.
  6. Preinstallation conferences.

7. Project closeout activities.
8. Startup and adjustment of systems.

## **1.05 COORDINATION DRAWINGS**

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
    - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
    - b. Coordinate the addition of trade-specific information to coordination drawings in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
    - c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
    - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
    - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
    - f. Indicate required installation sequences.
    - g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
  2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
  3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.

4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
  5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
  6. Mechanical and Plumbing Work: Show the following:
    - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
    - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
    - c. Fire-rated enclosures around ductwork.
  7. Electrical Work: Show the following:
    - a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
    - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
    - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor-control center locations.
    - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
  8. Fire-Protection System: Show the following:
    - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
  9. Review: Architect will review coordination drawings to confirm that in general the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
  10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Division 01 Section "Submittal Procedures."
- C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
  2. File Submittal Format: Submit or post coordination drawing files using PDF format.
  3. Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.
    - a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
    - b. Contractor shall execute a data licensing agreement in the form of AIA Document C106.



## 1.06 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
  2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
  2. Project number.
  3. Date.
  4. Name of Contractor.
  5. Name of Architect.
  6. RFI number, numbered sequentially.
  7. RFI subject.
  8. Specification Section number and title and related paragraphs, as appropriate.
  9. Drawing number and detail references, as appropriate.
  10. Field dimensions and conditions, as appropriate.
  11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  12. Contractor's signature.
  13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
    - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.
1. Attachments shall be electronic files in PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for approval of Contractor's means and methods.

- d. Requests for coordination information already indicated in the Contract Documents.
  - e. Requests for adjustments in the Contract Time or the Contract Sum.
  - f. Requests for interpretation of Architect's actions on submittals.
  - g. Incomplete RFIs or inaccurately prepared RFIs.
2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
  3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
    - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use software log that is part of web-based Project software.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

#### **1.07 DIGITAL PROJECT MANAGEMENT PROCEDURES**

- A. Use of Architect's Digital Data Files: Digital data files will be provided by Architect for Contractor's use during construction.
1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project record Drawings.
  2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
  3. Contractor shall execute a data licensing agreement in the form of AIA Document C106 Digital Data Licensing Agreement.
    - a. Subcontractors, and other parties granted access by Contractor to Architect's digital data files shall execute a data licensing agreement in the form of AIA Document C106
  4. The following digital data files will be furnished for each appropriate discipline:
    - a. Floor plans.
    - b. Reflected ceiling plans.
- B. **[Web-Based Project Software:** ]Provide, administer, and use web-based Project software site for purposes of hosting and managing Project communication and documentation until Final Completion.

1. Web-based Project software site includes, at a minimum, the following features:
    - a. Compilation of Project data, including Contractor, subcontractors, Architect, architect's consultants, Owner, and other entities involved in Project. Include names of individuals and contact information.
    - b. Access control for each entity for each workflow process, to determine entity's digital rights to create, modify, view, and print documents.
    - c. Document workflow planning, allowing customization of workflow between project entities.
    - d. Creation, logging, tracking, and notification for Project communications required in other Specification Sections, including, but not limited to, RFIs, submittals, Minor Changes in the Work, Construction Change Directives, and Change Orders.
    - e. Track status of each Project communication in real time, and log time and date when responses are provided.
    - f. Procedures for handling PDFs or similar file formats, allowing markups by each entity. Provide security features to lock markups against changes once submitted.
    - g. Processing and tracking of payment applications.
    - h. Processing and tracking of contract modifications.
    - i. Creating and distributing meeting minutes.
    - j. Document management for Drawings, Specifications, and coordination drawings, including revision control.
    - k. Management of construction progress photographs.
    - l. Mobile device compatibility, including smartphones and tablets.
  2. Provide up to seven web-based Project software user licenses for use of Owner, Architect, and Architect's consultants. Provide eight hours of software training at Architect's office for web-based Project software users.
  3. At completion of Project, provide digital archive in format that is readable by common desktop software applications in format acceptable to Architect. Provide data in locked format to prevent further changes.
- C. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
  2. Name file with submittal number or other unique identifier, including revision identifier.
  3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

## **1.08 PROJECT MEETINGS**

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

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times a minimum of 10 working days prior to meeting.
  2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Owner will schedule and conduct 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.
1. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Responsibilities and personnel assignments.
    - b. Tentative construction schedule.
    - c. Critical work sequencing and long lead items.
    - d. Designation of key personnel and their duties.
    - e. Lines of communications.
    - f. Use of web-based Project software.
    - g. Procedures for processing field decisions and Change Orders.
    - h. Procedures for RFIs.
    - i. Procedures for testing and inspecting.
    - j. Procedures for processing Applications for Payment.
    - k. Distribution of the Contract Documents.
    - l. Submittal procedures.
    - m. Preparation of Record Documents.
    - n. Use of the premises.
    - o. Work restrictions.
    - p. Working hours.
    - q. Owner's occupancy requirements.
    - r. Responsibility for temporary facilities and controls.
    - s. Procedures for moisture and mold control.
    - t. Procedures for disruptions and shutdowns.
    - u. Construction waste management and recycling.
    - v. Parking availability.
    - w. Office, work, and storage areas.
    - x. Equipment deliveries and priorities.
    - y. First aid.
    - z. Security.
    - aa. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Progress Meetings: Conduct progress meetings at regular intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
  - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    - 1) Review schedule for next period.
  - b. Review present and future needs of each entity present, including the following:
    - 1) Interface requirements.
    - 2) Sequence of operations.
    - 3) Resolution of BIM component conflicts.
    - 4) Status of submittals.
    - 5) Deliveries.
    - 6) Off-site fabrication.
    - 7) Access.
    - 8) Site use.
    - 9) Temporary facilities and controls.
    - 10) Progress cleaning.
    - 11) Quality and work standards.
    - 12) Status of correction of deficient items.
    - 13) Field observations.
    - 14) Status of RFIs.
    - 15) Status of Proposal Requests.
    - 16) Pending changes.
    - 17) Status of Change Orders.
    - 18) Pending claims and disputes.
    - 19) Documentation of information for payment requests.
4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

- a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- D. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other sections and when required for coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
  2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract Documents.
    - b. Options.
    - c. Related RFIs.
    - d. Related Change Orders.
    - e. Purchases.
    - f. Deliveries.
    - g. Submittals.
    - h. Review of mockups.
    - i. Possible conflicts.
    - j. Compatibility requirements.
    - k. Time schedules.
    - l. Weather limitations.
    - m. Manufacturer's written instructions.
    - n. Warranty requirements.
    - o. Compatibility of materials.
    - p. Acceptability of substrates.
    - q. Temporary facilities and controls.
    - r. Space and access limitations.
    - s. Regulations of authorities having jurisdiction.
    - t. Testing and inspecting requirements.
    - u. Installation procedures.
    - v. Coordination with other work.
    - w. Required performance results.
    - x. Protection of adjacent work.
    - y. Protection of construction and personnel.
  3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
  5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

- E. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 60 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
  2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
    - a. Preparation of Record Documents.
    - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
    - c. Procedures for completing and archiving web-based Project software site data files.
    - d. Submittal of written warranties.
    - e. Requirements for preparing operations and maintenance data.
    - f. Requirements for delivery of material samples, attic stock, and spare parts.
    - g. Requirements for demonstration and training.
    - h. Preparation of Contractor's punch list.
    - i. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
    - j. Submittal procedures.
    - k. Coordination of separate contracts.
    - l. Owner's partial occupancy requirements.
    - m. Installation of Owner's furniture, fixtures, and equipment.
    - n. Responsibility for removing temporary facilities and controls.
  4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

**PART 2 - PRODUCTS (NOT APPLICABLE)**

**PART 3 - EXECUTION (NOT APPLICABLE)**

**END OF SECTION**

**SECTION 01 32 00**  
**CONSTRUCTION PROGRESS DOCUMENTATION**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
1. Contractor's construction schedule.
  2. Daily construction reports.
  3. Field condition reports.

**1.02 DEFINITIONS**

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
  2. Predecessor Activity: An activity that precedes another activity in the network.
  3. Successor Activity: An activity that follows another activity in the network.
- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of the Project.
- C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Float: The measure of leeway in starting and completing an activity.
1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Format for Submittals: Submit required submittals in PDF electronic file format.



- B. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
- C. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
  - 1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
  - 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
  - 3. Total Float Report: List of all activities sorted in ascending order of total float.
- D. Daily Construction Reports: Submit at weekly intervals.
- E. Field Condition Reports: Submit at time of discovery of differing conditions.

#### **1.04 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, submittal schedule, progress reports, payment requests, and other required schedules and reports.
  - 1. Secure time commitments for performing critical elements of the Work from entities involved.
  - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

### **PART 2 - PRODUCTS**

#### **2.01 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL**

- A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of final completion.
  - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
  2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
  3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
  4. Startup and Testing Time: Include not less than 15 days for startup and testing.
  5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
  6. Punch List and Final Completion: Include not more than 30 days for punch list and final completion.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Work under More Than One Contract: Include a separate activity for each contract.
  2. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
  3. Work Restrictions: Show the effect of the following items on the schedule:
    - a. Coordination with existing construction.
    - b. Limitations of continued occupancies.
    - c. Uninterruptible services.
    - d. Partial occupancy before Substantial Completion.
    - e. Use of premises restrictions.
    - f. Provisions for future construction.
    - g. Seasonal variations.
    - h. Environmental control.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
- E. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
  2. Unanswered RFIs.
  3. Rejected or unreturned submittals.
  4. Notations on returned submittals.

- F. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule.
- G. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

## **2.02 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)**

- A. CPM Schedule: Prepare Contractor's construction schedule using a time-scaled CPM network analysis diagram for the Work.
  - 1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 30 days after date established for the Notice to Proceed.
    - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
  - 2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
  - 3. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to correlate with Contract Time.
- B. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work.
  - 1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
    - a. Preparation and processing of submittals.
    - b. Mobilization and demobilization.
    - c. Purchase of materials.
    - d. Delivery.
    - e. Fabrication.
    - f. Utility interruptions.
    - g. Installation.
    - h. Work by Owner that may affect or be affected by Contractor's activities.
    - i. Testing.
    - j. Punch list and final completion.
    - k. Activities occurring following final completion.
  - 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
  - 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.

4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
  - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- C. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall project schedule.
- D. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
  1. Contractor or subcontractor and the Work or activity.
  2. Description of activity.
  3. Principal events of activity.
  4. Immediate preceding and succeeding activities.
  5. Early and late start dates.
  6. Early and late finish dates.
  7. Activity duration in workdays.
  8. Total float or slack time.
  9. Average size of workforce.
  10. Dollar value of activity (coordinated with the schedule of values).
- E. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
  1. Identification of activities that have changed.
  2. Changes in early and late start dates.
  3. Changes in early and late finish dates.
  4. Changes in activity durations in workdays.
  5. Changes in the critical path.
  6. Changes in total float or slack time.
  7. Changes in the Contract Time.

## **2.03 REPORTS**

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
  1. List of subcontractors at Project site.
  2. List of separate contractors at Project site.
  3. Approximate count of personnel at Project site.
  4. Equipment at Project site.
  5. Material deliveries.
  6. High and low temperatures and general weather conditions, including presence of rain or snow.
  7. Accidents.

8. Meetings and significant decisions.
  9. Unusual events.
  10. Stoppages, delays, shortages, and losses.
  11. Meter readings and similar recordings.
  12. Emergency procedures.
  13. Orders and requests of authorities having jurisdiction.
  14. Change Orders received and implemented.
  15. Construction Change Directives received and implemented.
  16. Services connected and disconnected.
  17. Equipment or system tests and startups.
  18. Partial completions and occupancies.
  19. Substantial Completions authorized.
- B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

## **PART 3 - EXECUTION**

### **3.01 CONTRACTOR'S CONSTRUCTION SCHEDULE**

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
  2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
  3. As the Work progresses, indicate final completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
  2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

**END OF SECTION**

**SECTION 01 33 00**  
**SUBMITTAL PROCEDURES**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Sections:
  - 1. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
  - 2. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
  - 3. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
  - 4. Division 01 Section "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

**1.02 DEFINITIONS**

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action.
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

**1.03 ACTION SUBMITTALS**

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or modifications to submittals noted by the Architect and additional time for handling and reviewing submittals required by those corrections.

**1.04 SUBMITTAL ADMINISTRATIVE REQUIREMENTS**

- A. Architect's Digital Data Files: Electronic copies of Drawings of the Contract Drawings may be provided by Architect for Contractor's use in preparing submittals.

1. Architect will furnish Contractor electronic files for use in preparing Shop Drawings as follows:
    - a. One set of digital data drawing files in CAD format for floor plans and reflected ceiling plans of the Contract Drawings at no cost.
    - b. One set of the Contract Drawings in PDF format at no cost.
  2. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
  3. Contractor shall complete and execute Architect's "Electronic File Release Form" and, if applicable, "Electronic File Conversion Agreement" unless otherwise directed.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. 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.
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
    - a. Consultant Review: Allow 15 days for initial review of each submittal in addition to time allowed for Architect's review. Allow additional time if coordination with subsequent submittals is required.
  2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  3. Resubmittal Review: Allow 15 days for review of each resubmittal.
  4. Concurrent Consultant Review: Where submittals required by the Contract Documents are to be reviewed by the Architect's consultants, transmit submittal directly to consultant with one copy sent simultaneously to Architect, allow working 21 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
  5. No extension of contract time will be authorized or approved because of the Contractor's failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing and review by the Architect.

- D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
  2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
  3. Include the following information for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Contractor.
    - e. Name of subcontractor.
    - f. Name of supplier.
    - g. Name of manufacturer.
    - h. Submittal number or other unique identifier, including revision identifier.
      - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
    - i. Number and title of appropriate Specification Section.
    - j. Drawing number and detail references, as appropriate.
    - k. Location(s) where product is to be installed, as appropriate.
    - l. Other necessary identification.
  4. Additional Paper 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.
    - a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
  5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return without review submittals received from sources other than Contractor.
    - a. Transmittal Form for Paper Submittals: Provide locations on form for the following information:
      - 1) Project name.
      - 2) Date.
      - 3) Destination (To:).
      - 4) Source (From:).
      - 5) Name and address of Architect.
      - 6) Name of Contractor.
      - 7) Name of firm or entity that prepared submittal.
      - 8) Names of subcontractor, manufacturer, and supplier.



- 9) Category and type of submittal.
- 10) Submittal purpose and description.
- 11) Specification Section number and title.
- 12) Specification paragraph number or drawing designation and generic name for each of multiple items.
- 13) Drawing number and detail references, as appropriate.
- 14) Indication of full or partial submittal.
- 15) Transmittal number.
- 16) Submittal and transmittal distribution record.
- 17) Remarks.
- 18) Signature of transmitter.

E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
  - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).
3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner, containing the following information:
  - a. Project name.
  - b. Date.
  - c. Name and address of Architect.
  - d. Name of Contractor.
  - e. Name of firm or entity that prepared submittal.
  - f. Names of subcontractor, manufacturer, and supplier.
  - g. Category and type of submittal.
  - h. Submittal purpose and description.
  - i. Specification Section number and title.
  - j. Specification paragraph number or drawing designation and generic name for each of multiple items.
  - k. Drawing number and detail references, as appropriate.
  - l. Location(s) where product is to be installed, as appropriate.
  - m. Related physical samples submitted directly.
  - n. Indication of full or partial submittal.
  - o. Transmittal number.
  - p. Submittal and transmittal distribution record.
  - q. Other necessary identification.
  - r. Remarks.

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**SUBMITTAL PROCEDURES**

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5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
  - a. Project name.
  - b. Number and title of appropriate Specification Section.
  - c. Manufacturer name.
  - d. Product name.
  
- F. Options: Identify options requiring selection by the Architect.
  
- G. Deviations: Identify deviations from the Contract Documents on submittals.
  
- H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
  1. Note date and content of previous submittal.
  2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
  
- I. 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.
  
- J. Use for Construction: Use only final submittals that are marked with approval notation from Architect's action stamp.

## **PART 2 - PRODUCTS**

### **2.01 SUBMITTAL PROCEDURES**

- A. General Submittal Procedure Requirements:
  1. Submit electronic submittals via email as PDF electronic files.
    - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
  2. Action Submittals: Submit three paper copies of each submittal, unless otherwise indicated. Contractor shall keep one copy for Owner. Architect will return two copies.
  3. Informational Submittals: Submit one paper copy of each submittal, unless otherwise indicated. Architect will not return copies.
  4. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."
  5. Certificates and Certifications Submittals: Provide a 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.

- a. Provide a digital signature with digital certificate on electronically-submitted certificates and certifications where indicated.
    - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
  6. Test and Inspection Reports Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
  1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.
    - f. Application of testing agency labels and seals.
    - g. Notation of coordination requirements.
    - h. Availability and delivery time information.
  4. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams showing factory-installed wiring.
    - b. Printed performance curves.
    - c. Operational range diagrams.
    - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
  5. Submit Product Data before or concurrent with Samples.
  6. Submit Product Data in one of the following formats at the Contractor's option:
    - a. PDF electronic file.
    - b. Three paper copies of Product Data unless otherwise indicated. Architect will return two copies.
- 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, unless submittal based upon Architect's digital data drawing files is otherwise permitted.
  1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.

- b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. Seal and signature of professional engineer if specified.
  2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
  3. Submit Shop Drawings in in one of the following formats at the Contractor's option:
    - a. PDF electronic file.
    - b. Three opaque copies of each submittal. Architect will retain two copies; 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. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  2. 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 applicable Specification Section.
  3. 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.
    - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
  5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited

to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project record sample.
  - 1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
  
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
  1. Submit product schedule in one of the following formats at the Contractor's option:
    - a. PDF electronic file.
    - b. Three paper copies of product schedule or list unless otherwise indicated. Architect will return two copies.
  
- F. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
  
- G. Application for Payment and Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."
  
- H. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design.
  1. Submit subcontract list in one of the following formats at the Contractor's option:
    - a. PDF electronic file.
    - b. Three paper copies of subcontract list unless otherwise indicated. Architect will return two copies.
  
- I. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."
  
- J. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
  
- K. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of

Welding Procedure Specification and Procedure Qualification Record on American Welding Society (AWS) forms. Include names of firms and personnel certified.

- L. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- M. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- N. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- O. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- P. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- Q. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- R. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- S. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."
- T. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- U. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- V. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

- W. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."
- X. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

## **2.02 DELEGATED-DESIGN SERVICES**

- 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.
  - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally-signed PDF electronic file and three paper copies of certificate, signed and sealed by the responsible design professional licensed in the state where the project is located, 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. Include list of codes, loads, and other factors used in performing these services.

## **PART 3 - EXECUTION**

### **3.01 CONTRACTOR'S REVIEW**

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of

reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

**3.02 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. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

**END OF SECTION**



**SECTION 01 40 00**  
**QUALITY REQUIREMENTS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. 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. 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.
  - 2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections include:
  - 1. Division 01 Section "Mockups" for integrated exterior mockups required for the exterior envelope.
  - 2. Divisions 02 through 49 Sections for specific test and inspection requirements.

**1.02 DEFINITIONS**

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Mockups: Full size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless

otherwise indicated, approved mockups establish the standard by which the Work will be judged.

- a. Laboratory Mockups: Full-size physical assemblies constructed and tested at testing facility to verify performance characteristics.
  - b. Integrated Exterior Mockups: Mockups of the exterior envelope constructed on-site as freestanding temporary built elements, consisting of multiple products, assemblies, and subassemblies.
  - c. Refer to Division 01 Section "Mockups" for specific requirements related to integrated exterior mockups.
- D. Preconstruction Testing: Tests and inspections performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade or trades.
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

### **1.03 DELEGATED-DESIGN SERVICES**

- 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.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

#### **1.04 CONFLICTING REQUIREMENTS**

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

#### **1.05 ACTION SUBMITTALS**

- A. Shop Drawings: For integrated exterior mockups.
  1. Include plans, sections, and elevations, indicating materials and size of mockup construction.
  2. Indicate manufacturer and model number of individual components.
  3. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.
- B. Delegated-Design Services Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit 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, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

#### **1.06 INFORMATIONAL SUBMITTALS**

- A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems.
  1. Main wind-force resisting system or a wind-resisting component listed in the wind-force-resisting system quality assurance plan prepared by the Architect.
- B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

- C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
  - 1. Specification Section number and title.
  - 2. Entity responsible for performing tests and inspections.
  - 3. Description of test and inspection.
  - 4. Identification of applicable standards.
  - 5. Identification of test and inspection methods.
  - 6. Number of tests and inspections required.
  - 7. Time schedule or time span for tests and inspections.
  - 8. Requirements for obtaining samples.
  - 9. Unique characteristics of each quality-control service.
- D. Reports: Prepare and submit certified written reports and documents as specified.
- E. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

#### **1.07 CONTRACTOR'S QUALITY-CONTROL PLAN**

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's Construction Schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
  - 1. Contractor-performed tests and inspections including Subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
  - 2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to

testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.

- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

## **1.08 REPORTS AND DOCUMENTS**

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

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

- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
5. Other required items indicated in individual Specification Sections.

## **1.09 QUALITY ASSURANCE**

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

- B. **Manufacturer Qualifications:** A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. **Fabricator Qualifications:** A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. **Installer Qualifications:** A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. **Professional Engineer Qualifications:** A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. **Specialists:** Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
  - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. **Testing Agency Qualifications:** An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
  - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. **Manufacturer's Representative Qualifications:** An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. **Mockups:** Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
  - 1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.

2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
  3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed to perform same tasks during the construction at Project.
  4. Demonstrate the proposed range of aesthetic effects and workmanship.
  5. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
    - a. Allow seven days for initial review and each re-review of each mockup.
  6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
  7. Demolish and remove mockups when directed, unless otherwise indicated.
- J. Integrated Exterior Mockups: Comply with requirements in Division 01 Section "Mockups."

#### **1.10 QUALITY CONTROL**

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
1. 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.
  2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
  3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
  4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. **Manufacturer's Field Services:** Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.
- D. **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.
- E. **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-control service through Contractor.
  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.
- F. **Associated Services:** 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:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  4. Facilities for storage and field curing of test samples.
  5. Delivery of samples to testing agencies.
  6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. **Coordination:** 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.



1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's Construction Schedule. Update as the Work progresses.
1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

### **1.11 SPECIAL TESTS AND INSPECTIONS**

- A. Special Tests and Inspections: Except as otherwise indicated, Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
  2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
  3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
  4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
  5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
  6. Retesting and reinspecting corrected work.

## **PART 2 - PRODUCTS (NOT APPLICABLE)**

## **PART 3 - EXECUTION**

### **3.01 REPAIR AND PROTECTION**

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."
- B. Protect construction exposed by or for quality-control service activities.

- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

**END OF SECTION**

**SECTION 01 42 00**  
**REFERENCES**

**PART 1 - GENERAL**

**1.01 DEFINITIONS**

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

**1.02 INDUSTRY STANDARDS**

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

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**REFERENCES**

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- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
  - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

### **1.03 ABBREVIATIONS AND ACRONYMS**

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."
- B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
  - 1. IAPMO - International Association of Plumbing and Mechanical Officials; [www.iapmo.org](http://www.iapmo.org).
  - 2. ICC - International Code Council; [www.iccsafe.org](http://www.iccsafe.org).
  - 3. ICC-ES - ICC Evaluation Service, LLC; [www.icc-es.org](http://www.icc-es.org).
- C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
  - 1. COE - Army Corps of Engineers; [www.usace.army.mil](http://www.usace.army.mil).
  - 2. CPSC - Consumer Product Safety Commission; [www.cpsc.gov](http://www.cpsc.gov).
  - 3. DOC - Department of Commerce; National Institute of Standards and Technology; [www.nist.gov](http://www.nist.gov).
  - 4. DOD - Department of Defense; [www.quicksearch.dla.mil](http://www.quicksearch.dla.mil).
  - 5. DOE - Department of Energy; [www.energy.gov](http://www.energy.gov).
  - 6. EPA - Environmental Protection Agency; [www.epa.gov](http://www.epa.gov).
  - 7. FAA - Federal Aviation Administration; [www.faa.gov](http://www.faa.gov).
  - 8. FG - Federal Government Publications; [www.gpo.gov/fdsys](http://www.gpo.gov/fdsys).
  - 9. GSA - General Services Administration; [www.gsa.gov](http://www.gsa.gov).
  - 10. HUD - Department of Housing and Urban Development; [www.hud.gov](http://www.hud.gov).
  - 11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; [www.eetd.lbl.gov](http://www.eetd.lbl.gov).
  - 12. OSHA - Occupational Safety & Health Administration; [www.osha.gov](http://www.osha.gov).
  - 13. SD - Department of State; [www.state.gov](http://www.state.gov).
  - 14. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; [www.trb.org](http://www.trb.org).

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### **REFERENCES**

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15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; [www.ars.usda.gov](http://www.ars.usda.gov).
  16. USDA - Department of Agriculture; Rural Utilities Service; [www.usda.gov](http://www.usda.gov).
  17. USDOJ - Department of Justice; Office of Justice Programs; National Institute of Justice; [www.ojp.usdoj.gov](http://www.ojp.usdoj.gov).
  18. USP - U.S. Pharmacopeial Convention; [www.usp.org](http://www.usp.org).
  19. USPS - United States Postal Service; [www.usps.com](http://www.usps.com).
- D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list.
1. CFR - Code of Federal Regulations; Available from Government Printing Office; [www.gpo.gov/fdsys](http://www.gpo.gov/fdsys).
  2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; [www.quicksearch.dla.mil](http://www.quicksearch.dla.mil).
  3. DSCC - Defense Supply Center Columbus; (See FS).
  4. FED-STD - Federal Standard; (See FS).
  5. FS - Federal Specification; Available from DLA Document Services; [www.quicksearch.dla.mil](http://www.quicksearch.dla.mil).
    - a. Available from Defense Standardization Program; [www.dsp.dla.mil](http://www.dsp.dla.mil).
    - b. Available from General Services Administration; [www.gsa.gov](http://www.gsa.gov).
    - c. Available from National Institute of Building Sciences/Whole Building Design Guide; [www.wbdg.org](http://www.wbdg.org).
  6. MILSPEC - Military Specification and Standards; (See DOD).
- E. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
1. CBHF; State of California; Department of Consumer Affairs; Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation; [www.bearhfti.ca.gov](http://www.bearhfti.ca.gov).
  2. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; [www.calregs.com](http://www.calregs.com).
  3. CDHS; California Department of Health Services; (See CDPH).
  4. CDPH; California Department of Public Health; Indoor Air Quality Program; [www.cal-iaq.org](http://www.cal-iaq.org).
  5. CPUC; California Public Utilities Commission; [www.cpuc.ca.gov](http://www.cpuc.ca.gov).
  6. SCAQMD; South Coast Air Quality Management District; [www.aqmd.gov](http://www.aqmd.gov).
  7. TAS, Texas Accessibility Standards; <http://www.tdlr.texas.gov/ab/abtas.htm>.
  8. TDLR, Texas Department of Licensing and Regulation; <https://www.tdlr.texas.gov/ab/ab.htm>.
  9. TFS; Texas A&M Forest Service; Sustainable Forestry and Economic Development; [www.txforests.tamu.edu](http://www.txforests.tamu.edu).

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REFERENCES

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**PART 2 - PRODUCTS (NOT APPLICABLE)**

**PART 3 - EXECUTION (NOT APPLICABLE)**

**END OF SECTION**

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REFERENCES

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**SECTION 01 43 39**  
**MOCKUPS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes integrated exterior mockup.
- B. Related Sections include:
  - 1. Division 01 Section "Quality Requirements" for general requirements governing integrated exterior mockups.
  - 2. Divisions 04 through 09 sections for products to be integrated into integrated exterior mockups.

**1.02 DEFINITIONS**

- A. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.

**1.03 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. For mockups, comply with the following:
    - a. Meet with Owner, Owner's Representative, Architect, testing and inspecting agency representative, installers of products to be used in integrated exterior mockup and room mockup, and manufacturer's representative for air barrier, aluminum curtain wall, and storefront products.
    - b. Review requirements for each product including installation, special details, air- or water leakage, bond testing, protection, and work scheduling that covers integrated exterior mockups.
    - c. Review coordination of equipment and furnishings provided by the Owner for room mockups.
    - d. Review locations and extent of mockups.
    - e. Review testing procedures to be performed on mockups.

**1.04 ACTION SUBMITTALS**

- A. Shop Drawings: Shop Drawings: For integrated exterior, preconstruction laboratory, and room mockups.

1. Include key plan to indicate location of mockups and orientation of face of mockups.
  2. Include plans, elevations, sections, and mounting, attachment, and support details.
  3. Indicate manufacturer and model number of individual components, subassemblies, and assemblies.
  4. Revise and resubmit Shop Drawings to reflect approved modifications in details and component interfaces resulting from changes made during testing procedures.
- B. Delegated Design Submittal: For temporary structural supports for mockups not attached to building structure, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

### **1.05 INFORMATIONAL SUBMITTALS**

- A. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, source of supply, and other information as required to identify materials used.
1. Submittal is for information only. Neither receipt of list nor approval of mockup constitutes approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.
- B. Product Data: Copies of Product Data for mockup materials indicating review and approval by Architect.
1. Submit approved copies in a single package in electronic PDF format unless otherwise directed. Incomplete submittal packages will not be accepted.
- C. Photography Log: List of photographs in thumbnail format with annotations indicating subject and date taken.
1. Included header/footer on each page with name of Project, Owner, and Architect.
  2. Format: Electronic PDF format.

### **1.06 QUALITY ASSURANCE**

- A. Build mockups to do the following:
1. Verify selections made under Sample submittals.
  2. Demonstrate aesthetic effects.
  3. Demonstrate the qualities of products and workmanship.
  4. Demonstrate acceptable coordination between components and systems.
  5. Perform preconstruction testing, such as window air- and water-leakage testing.
- B. Fabrication: Before fabricating or installing portions of the Work requiring mockups, build mockups for each form of construction and finish required. Use materials and installation methods as required for the Work.
1. Build mockups of size indicated.



2. Build mockups in location indicated or, if not indicated, as directed by Architect.
3. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at Project.
4. Demonstrate the proposed range of aesthetic effects and workmanship.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed unless otherwise indicated.

C. Notifications:

1. Notify Architect seven days in advance of the dates and times when mockups will be constructed.
2. Notify Architect 14 days in advance of the dates and times when mockups will be tested.
3. Allow seven days for initial review and each re-review of each mockup.

D. Approval: Obtain Architect's approval of mockups before starting fabrication or construction of corresponding Work.

1. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
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.

## **1.07 COORDINATION**

- A. Coordinate schedule for construction of integrated mockups so that mockups can be reviewed and approved in a timely fashion without impact to the Project schedule.

## **PART 2 - PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design support structure for free-standing mockups.
- B. Structural Performance: Wind Loads: As indicated on Drawings.
- C. Mockup Testing Performance Requirements: Perform tests using design pressures and performance criteria indicated for assemblies and products that are specified in other Sections and incorporated into integrated exterior mockups.

## **2.02 INTEGRATED MOCKUPS**

- A. Construct integrated exterior mockups according to approved mockup Shop Drawings. Construct mockups to demonstrate constructability, coordination of trades, and sequencing of Work; and to ensure materials, components, subassemblies, assemblies, and interfaces integrate into a system complying with indicated performance and aesthetic requirements.
- B. Design and construct foundation and superstructure to support free-standing integrated exterior mockups.
- C. Build integrated exterior mockups using installers and construction methods that will be used in completed construction.
- D. Use specified products which have been reviewed and approved by the Architect.
  - 1. Products to be installed on the exterior integrated mockup include, but are not necessarily limited to the following:
    - a. Cold-formed metal framing.
    - b. Wood blocking.
    - c. Gypsum sheathing.
    - d. Insulation including continuous insulation and batt insulation.
    - e. Air and weather barriers.
    - f. Metal composite material wall panels.
    - g. Thermal insulation.
    - h. Formed metal flashing, whether shop fabricated or manufactured units, including through-wall flashing, base flashing, counterflashing, and copings.
    - i. Flexible through wall flashings.
    - j. Joint sealants.
    - k. Aluminum-framed openings including storefront, curtainwall, and window units.
    - l. Glazing including insulated glazing units, sealants, gaskets, and sealants.
    - m. Louvers.
    - n. Paint finishes.
- E. Photographic Documentation: Document construction of integrated exterior mockups. Provide photographs showing details of interface of different materials and assemblies.
- F. Digital Images: Provide images in JPG format, with minimum size of 8 megapixels.

## **PART 3 - EXECUTION**

### **3.01 ERECTION**

- A. Construct mockups to confirm product selections made under previous submittals, verify compliance with design intent, and specified requirements, and to confirm the following:

1. Integrated exterior mockup assembly is capable of providing a complete air and water tight facility.
  2. Integrated interior assembly is capable of providing a complete and water tight facility.
- B. Build mockups as indicated on Drawings and according to approved Shop Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.
1. Provide supplementary framing for exterior mockup as required to support mockup and so that mockup can withstand wind requirements. Do not install supplementary framing in a way that impairs the visual quality of the mockup face or that interferes with ability of Architect and Owner to review installation of mockup components.
- C. Commence erection of mockups only after obtaining Architect's approval of Product Data, Shop Drawings, and Samples for each product to be included in the mockup.
- D. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project site.
- E. Construct mockups in stages to permit inspection by the Architect or the Owner's testing agency of Work that will be concealed in final assemblies. Where Work is covered before written approval is given by the Architect or the Owner's testing agency, the Contractor will be responsible for removing and reinstalling products without expense to the Owner.
- F. Photographs: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
1. Maintain key plan with each set of construction photographs that identifies each photographic location.
  2. Take photographs as each product is installed clearly showing special techniques or details used.
  3. Maintain digital file of photographs in field office for reference by Architect, Owner, and Installer.
- G. Review and Approval:
1. Obtain written approval of integrated mockups from Owner and Architect before starting work, fabrication, or construction.
    - a. Allow seven days for review and re-review of each product installed.
    - b. Allow fourteen days for review of completed mockup.
  2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.
  3. Maintain integrated exterior mockups during construction in an undisturbed condition as a standard for judging the completed Work.

4. Demolish and remove integrated exterior mockups when directed unless otherwise indicated.

**3.02 FIELD QUALITY CONTROL**

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

**END OF SECTION**

**SECTION 01 50 00**  
**TEMPORARY FACILITIES AND CONTROLS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Sections include Division 01 Section "Summary" for work restrictions and limitations on utility interruptions.

**1.02 USE CHARGES**

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Pay sewer-service use charges for sewer usage by all entities for construction operations.
- C. Water Service: Pay water-service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Pay electric-power-service use charges for electricity used by all entities for construction operations.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Implementation and Termination Schedule: Within 15 days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.
- C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.

- D. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire prevention program.
- E. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold.
- F. COVID-19 Protocols: Describe procedures and controls for protecting personnel from contracting and spreading COVID-19 at the Project site.

#### **1.04 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.
- C. Accessible Temporary Egress: Comply with applicable provisions in "the TDLR "2012 Texas Accessibility Standards" (TAS).

#### **1.05 PROJECT CONDITIONS**

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to 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**

#### **2.01 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, with 1-5/8-inch-OD top rails.
  - 1. Fencing Windscreen Privacy Screen: Polyester fabric scrim with grommets for attachment to chain link fence, sized to height of fence, in color selected by Architect from manufacturer's standard colors.

#### **2.02 TEMPORARY FACILITIES**

- A. Field Offices, General: Owner will provide space for field offices in existing building at Project site. Contractor is responsible for interior modifications and improvements.

- B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
  - 1. Store combustible materials apart from building.

### **2.03 EQUIPMENT**

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
  - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
  - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
  - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Division 01 Section "Closeout Procedures".

## **PART 3 - EXECUTION**

### **3.01 TEMPORARY FACILITIES, GENERAL**

- A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
  - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

### **3.02 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.

### **3.03 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. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
  - 1. Toilets: Use of Owner's existing toilet facilities will be permitted in buildings to be demolished.
- E. 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.
- F. 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.
- G. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
  - 1. Install electric power service overhead unless otherwise indicated.
- H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
  - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.



- I. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line(s) for each field office.
  - 1. Provide additional telephone lines for the following:
    - a. Provide a dedicated telephone line for each facsimile machine in each field office.
  - 2. At each telephone, post a list of important telephone numbers.
    - a. Police and fire departments.
    - b. Ambulance service.
    - c. Contractor's home office.
    - d. Contractor's emergency after-hours telephone number.
    - e. Architect's office.
    - f. Engineers' offices.
    - g. Owner's office.
    - h. Principal subcontractors' field and home offices.
  - 3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.
- J. Electronic Communication Service: Provide secure WiFi wireless connection to internet with provisions for access by Owner, Architect, and other consultants as requested.

### **3.04 SUPPORT FACILITIES INSTALLATION**

- A. General: Comply with the following:
  - 1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
  - 2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations.
  - 1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
- C. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
  2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Division 31 Section "Earth Moving."
  3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
- D. Traffic Controls: Comply with requirements of authorities having jurisdiction.
1. Protect existing site improvements to remain including curbs, pavement, and utilities.
  2. Maintain access for fire-fighting equipment and access to fire hydrants.
- E. Parking: Use designated areas of existing parking areas for construction personnel.
- F. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
  2. Remove snow and ice as required to minimize accumulations.
- G. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
1. Identification Signs: Provide Project identification signs as indicated on Drawings.
  2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
    - a. Provide temporary, directional signs for construction personnel and visitors.
  3. Maintain and touchup signs so they are legible at all times.
- H. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Division 01 Section "Execution."
- I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

### **3.05 SECURITY AND PROTECTION FACILITIES INSTALLATION**

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
- D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- E. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.
- F. Site Enclosure Fence: Before construction operations begin, 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. Furnish one set of keys to Owner.
- G. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.
- H. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- I. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- J. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

- K. 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; manage fire prevention program.
1. Prohibit smoking in construction areas.
  2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
  3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
  4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

### **3.06 MOISTURE AND MOLD CONTROL**

- A. Contractor's Moisture Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect materials from water damage and keep porous and organic materials from coming into prolonged contact with concrete.
- C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
  2. Keep interior spaces reasonably clean and protected from water damage.
  3. Discard or replace water-damaged and wet material.
  4. Discard, replace, or clean stored or installed material that begins to grow mold.
  5. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
- D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
  2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
  3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.

- a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective and require replacing.
- b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
- c. Remove and replace materials that cannot be completely restored to their manufactured moisture level within 48 hours.

### **3.07 COVID-19 PROTOCOLS**

- A. Develop protocols for controlling the spread of the COVID-19 coronavirus at the Project site.
  1. Protocols shall be consistent with requirements and recommendations of authorities having jurisdiction and with those established by the Owner.
  2. Distribute copies of protocols to those entities who will be working or do business at the Project site.
  3. Enforce protocols at the Project site.

### **3.08 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.
  1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- 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.
  1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
  2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for

fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

**END OF SECTION**

**SECTION 01 60 00**  
**PRODUCT REQUIREMENTS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. 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; and comparable products.
- B. Related Sections include Division 01 Section "Substitution Procedures" for requests for substitutions.

**1.02 DEFINITIONS**

- A. Products: Items obtained 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. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
  - 3. Comparable Product: Product that is demonstrated and approved through submittal process 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. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," 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 additional manufacturers named in the specification.

**1.03 ACTION SUBMITTALS**

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

1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
  - a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
  - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

#### **1.04 QUALITY ASSURANCE**

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

#### **1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
  1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
  2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
  3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
  4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
  1. Store products to allow for inspection and measurement of quantity or counting of units.
  2. Store materials in a manner that will not endanger Project structure.
  3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
  4. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.



5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

## **1.06 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.
  1. **Manufacturer's Warranty:** Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
  2. **Special Warranty:** Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. **Special Warranties:** Prepare a written document that contains appropriate terms and identification, ready for execution.
  1. **Manufacturer's Standard Form:** Modified to include Project-specific information and properly executed.
  2. **Specified Form:** When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
  3. Refer to Divisions 02 through 49. Sections for specific content requirements and particular requirements for submitting special warranties.
- C. **Submittal Time:** Comply with requirements in Division 01 Section "Closeout Procedures."

## **PART 2 - PRODUCTS**

### **2.01 PRODUCT SELECTION PROCEDURES**

- A. **General Product Requirements:** Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, 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. **Standard Products:** If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
  3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
  4. Where products are accompanied by the term "as selected," Architect will make selection.

5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

**B. Product Selection Procedures:**

1. **Product:** Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. **Manufacturer/Source:** Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. **Products:**
  - a. **Restricted List:** Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered, unless otherwise indicated.
  - b. **Nonrestricted List:** Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
4. **Manufacturers:**
  - a. **Restricted List:** Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered, unless otherwise indicated.
  - b. **Nonrestricted List:** Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
5. **Basis-of-Design Product:** Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

- C. Visual Matching Specification:** Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Division 01 Section "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

## **2.02 COMPARABLE PRODUCTS**

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require 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. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
  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 APPLICABLE)**

**END OF SECTION**

**SECTION 01 73 00**  
**EXECUTION**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Field engineering and surveying.
  - 3. Installation of the Work.
  - 4. Cutting and patching.
  - 5. Progress cleaning.
  - 6. Starting and adjusting.
  - 7. Protection of installed construction.
  - 8. Correction of the Work.
  
- B. Related Requirements:
  - 1. Division 01 Section "Summary" for limits on use of Project site.
  - 2. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

**1.02 INFORMATIONAL SUBMITTALS**

- A. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
  
- B. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

**1.03 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.
  
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
2. 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.
3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching 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 provide a match acceptable to Architect for the visual and functional performance of in-place materials.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
  1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
  2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### **3.02 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 caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Division 01 Section "Project Management and Coordination."

### **3.03 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.
  - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.

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## **EXECUTION**

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2. Establish limits on use of Project site.
  3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
  4. Inform installers of lines and levels to which they must comply.
  5. Check the location, level and plumb, of every major element as the Work progresses.
  6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
  7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. 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.

### **3.04 FIELD ENGINEERING**

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
- B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
- C. Final Property Survey: Engage a land surveyor to 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.
1. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

### **3.05 INSTALLATION**

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

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## **EXECUTION**

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1. Make vertical work plumb and make horizontal work level.
  2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  3. Conceal pipes, ducts, and wiring in finished areas unless otherwise 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. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. 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.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
  2. Allow for building movement, including thermal expansion and contraction.
  3. Coordinate installation of anchorages. 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.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

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**EXECUTION**

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### **3.06 CUTTING AND PATCHING**

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. 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.
- E. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- F. 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.
- G. 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.
  - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  - 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
  - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  - 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as

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invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
  3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
  4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

### **3.07 PROGRESS CLEANING**

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
  3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- 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.
1. Remove liquid spills promptly.
  2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- 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: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
- 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.

### **3.08 STARTING AND ADJUSTING**

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- 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: Comply with qualification requirements in Section 014000 "Quality Requirements"

### **3.09 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.

**END OF SECTION**

**SECTION 01 77 00**  
**CLOSEOUT PROCEDURES**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Substantial Completion procedures.
  - 2. Final completion procedures.
  - 3. Warranties.
  - 4. Final cleaning.
  
- B. Related Sections:
  - 1. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 2. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
  - 3. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
  - 4. Divisions 02 through 49 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

**1.02 ACTION SUBMITTALS**

- A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- B. Certified List of Incomplete Items: Final submittal at final completion.

**1.03 CLOSEOUT SUBMITTALS**

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

**1.04 MAINTENANCE MATERIAL SUBMITTALS**

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

## **1.05 SUBSTANTIAL COMPLETION PROCEDURES**

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
  3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number.
    - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.
  5. Submit testing, adjusting, and balancing records.
  6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
  2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  3. Complete startup and testing of systems and equipment.
  4. Perform preventive maintenance on equipment used prior to Substantial Completion.
  5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Division 01 Section "Demonstration and Training."
  6. Advise Owner of changeover in utility services.
  7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
  8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.

9. Complete final cleaning requirements.
  10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. 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. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
  2. Results of completed inspection will form the basis of requirements for final completion.

#### **1.06 FINAL COMPLETION PROCEDURES**

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
  2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  4. Submit pest-control final inspection report.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. 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. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
- C. Accessibility Inspection:
1. Owner will engage a Registered Accessibility Specialist to perform accessibility inspection required by the Texas Department of Licensing and Regulation (TDLR).
  2. Coordinate inspection schedule with Owner's Accessibility Specialist.
  3. Correct deficiencies identified in accessibility inspection.

4. Notify the Owner when deficiencies have been corrected.

#### **1.07 LIST OF INCOMPLETE ITEMS (PUNCH LIST)**

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
  1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
  2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  3. Include the following information at the top of each page:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Contractor.
    - e. Page number.
  4. Submit list of incomplete items in PDF electronic file format. Architect will return annotated file.

#### **1.08 SUBMITTAL OF PROJECT WARRANTIES**

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
  1. Submit on digital media acceptable to Architect.
- E. Warranties in Paper Form:

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
  2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- F. Provide additional copies of each warranty to include in operation and maintenance manuals.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- A. Cleaning Agents: Use 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.

## **PART 3 - EXECUTION**

### **3.01 FINAL CLEANING**

- A. General: Perform final cleaning. 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. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.
    - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - e. Remove snow and ice to provide safe access to building.



- f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
  - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
  - h. Sweep concrete floors broom clean in unoccupied spaces.
  - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
  - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
  - k. Remove labels that are not permanent.
  - l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
  - m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
  - n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
  - o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
  - p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
  - q. Leave Project clean and ready for occupancy.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.
- D. Construction Waste Disposal: Comply with waste disposal requirements in Division 01 Section "Temporary Facilities and Controls."

### **3.02 REPAIR OF THE WORK**

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair, or remove and replace, defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
- 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
  - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.

- a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

**END OF SECTION**

**SECTION 01 78 23**  
**OPERATION AND MAINTENANCE DATA**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operation and maintenance documentation directory.
  - 2. Emergency manuals.
  - 3. Operation and maintenance manuals for systems, subsystems, and equipment.
  - 4. Product maintenance manuals.
- B. Related Sections include Divisions 02 through 49 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

**1.02 CLOSEOUT SUBMITTALS**

- A. Format: Submit operations and maintenance manuals in the following format:
  - 1. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will return two copies.
- B. Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.
  - 1. Correct or modify each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

**PART 2 - PRODUCTS**

**2.01 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS**

- 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. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Construction Manager.
7. Name and contact information for Architect.
8. Name and contact information for Commissioning Agent.
9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
10. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
  - a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
  - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.

- b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

## **2.02 EMERGENCY MANUALS**

- A. Content: Organize manual into a separate section for each of the following:
  - 1. Type of emergency.
  - 2. Emergency instructions.
  - 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
  - 1. Fire.
  - 2. Flood.
  - 3. Gas leak.
  - 4. Water leak.
  - 5. Power failure.
  - 6. Water outage.
  - 7. System, subsystem, or equipment failure.
  - 8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
  - 1. Instructions on stopping.
  - 2. Shutdown instructions for each type of emergency.
  - 3. Operating instructions for conditions outside normal operating limits.
  - 4. Required sequences for electric or electronic systems.
  - 5. Special operating instructions and procedures.

## **2.03 OPERATION 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. Use designations for systems and equipment indicated on Contract Documents.
  - 2. Performance and design criteria if Contractor is delegated design responsibility.
  - 3. Operating standards.
  - 4. Operating procedures.

5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. 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.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. 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.

## 2.04 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

- C. Product Information: Include the following, as applicable:
  - 1. Product name and model number.
  - 2. Manufacturer's name.
  - 3. Color, pattern, and texture.
  - 4. Material and chemical composition.
  - 5. Reordering information for specially manufactured products.
  
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
  - 1. Inspection procedures.
  - 2. Types of cleaning agents to be used and methods of cleaning.
  - 3. List of cleaning agents and methods of cleaning detrimental to product.
  - 4. Schedule for routine cleaning and maintenance.
  - 5. Repair instructions.
  
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
  
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

## **2.05 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS**

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
  
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
  
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
  - 1. Standard 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.
  
- D. 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.
  6. Demonstration and training video recording, if available.
- E. 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.
- F. 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.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

## **PART 3 - EXECUTION**

### **3.01 MANUAL PREPARATION**

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- C. 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.
- D. 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.
- E. Drawings: Prepare 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.

1. Do not use original project record documents as part of operation and maintenance manuals.
- F. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

**END OF SECTION**

**SECTION 01 78 39**  
**PROJECT RECORD DOCUMENTS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes administrative and procedural requirements for project record documents, including the following:
  - 1. Record Drawings.
  - 2. Record Product Data.
  - 3. Miscellaneous record submittals.
  
- B. Related Sections include:
  - 1. Division 01 Section "Execution" for final property survey.
  - 2. Division 01 Section "Closeout Procedures" for general closeout procedures.
  - 3. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 4. Divisions 02 through 49 Sections for specific requirements for project record documents of the Work in those Sections.

**1.02 CLOSEOUT SUBMITTALS**

- A. Record Drawings: Submit two sets of marked-up record prints.
- B. Record Product Data: Submit one paper copy of each submittal.
- C. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one paper copy of each submittal
- D. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

**PART 2 - PRODUCTS**

**2.01 RECORD DRAWINGS**

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Record data as soon as possible after obtaining it.
    - c. Record and check the markup before enclosing concealed installations.
  2. Content: Types of items requiring marking include, but are not limited to, the following:
    - a. Dimensional changes to Drawings.
    - b. Revisions to details shown on Drawings.
    - c. Depths of foundations.
    - d. Locations and depths of underground utilities.
    - e. Revisions to routing of piping and conduits.
    - f. Revisions to electrical circuitry.
    - g. Actual equipment locations.
    - h. Duct size and routing.
    - i. Locations of concealed internal utilities.
    - j. Changes made by Change Order or Change Directive.
    - k. Changes made following Architect's written orders.
    - l. Details not on the original Contract Drawings.
    - m. Field records for variable and concealed conditions.
    - n. Record information on the Work that is shown only schematically.
  3. Mark the Contract Drawings and Shop Drawings completely and accurately. Utilize personnel proficient at recording graphic information in production of marked-up record prints.
  4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  5. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
  2. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect.
    - e. Name of Contractor.

## **2.02 RECORD PRODUCT DATA**

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
  - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
  - 3. Note related Change Orders and record Drawings where applicable.
- C. Format: Submit record Product Data as paper copy.

## **2.03 MISCELLANEOUS RECORD SUBMITTALS**

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as paper copy.

## **PART 3 - EXECUTION**

### **3.01 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: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. 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**

**SECTION 01 79 00**  
**DEMONSTRATION AND TRAINING**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. 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.
  3. Demonstration and training video recordings.

**1.02 INFORMATIONAL SUBMITTALS**

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
1. Indicate proposed training modules utilizing manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

**1.03 CLOSEOUT SUBMITTALS**

- A. Demonstration and Training Video Recordings: Submit one copy within seven days of end of each training module.
1. At completion of training, submit complete training manual(s) for Owner's use.

**1.04 QUALITY ASSURANCE**

- A. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 01 Section "Quality Requirements," experienced in operation and maintenance procedures and training.

**1.05 COORDINATION**

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.

- B. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

## **PART 2 - PRODUCTS**

### **2.01 INSTRUCTION PROGRAM**

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
  - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
    - a. System, subsystem, and equipment descriptions.
    - b. Performance and design criteria if Contractor is delegated design responsibility.
    - c. Operating standards.
    - d. Regulatory requirements.
    - e. Equipment function.
    - f. Operating characteristics.
    - g. Limiting conditions.
    - h. Performance curves.
  - 2. Documentation: Review the following items in detail:
    - a. Emergency manuals.
    - b. Operations manuals.
    - c. Maintenance manuals.
    - d. Project record documents.
    - e. Identification systems.
    - f. Warranties and bonds.
    - g. Maintenance service agreements and similar continuing commitments.
  - 3. Emergencies: Include the following, as applicable:
    - a. Instructions on meaning of warnings, trouble indications, and error messages.
    - b. Instructions on stopping.
    - c. Shutdown instructions for each type of emergency.
    - d. Operating instructions for conditions outside of normal operating limits.
    - e. Sequences for electric or electronic systems.
    - f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:
  - a. Startup procedures.
  - b. Equipment or system break-in procedures.
  - c. Routine and normal operating instructions.
  - d. Regulation and control procedures.
  - e. Control sequences.
  - f. Safety procedures.
  - g. Instructions on stopping.
  - h. Normal shutdown instructions.
  - i. Operating procedures for emergencies.
  - j. Operating procedures for system, subsystem, or equipment failure.
  - k. Seasonal and weekend operating instructions.
  - l. Required sequences for electric or electronic systems.
  - m. Special operating instructions and procedures.
  
5. Adjustments: Include the following:
  - a. Alignments.
  - b. Checking adjustments.
  - c. Noise and vibration adjustments.
  - d. Economy and efficiency adjustments.
  
6. Troubleshooting: Include the following:
  - a. Diagnostic instructions.
  - b. Test and inspection procedures.
  
7. Maintenance: Include the following:
  - a. Inspection procedures.
  - b. Types of cleaning agents to be used and methods of cleaning.
  - c. List of cleaning agents and methods of cleaning detrimental to product.
  - d. Procedures for routine cleaning
  - e. Procedures for preventive maintenance.
  - f. Procedures for routine maintenance.
    - 1) Instruction on use of special tools.
  
8. Repairs: Include the following:
  - a. Diagnosis instructions.
  - b. Repair instructions.
  - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  - d. Instructions for identifying parts and components.
  - e. Review of spare parts needed for operation and maintenance.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Division 01 Section "Operations and Maintenance Data."

### **3.02 INSTRUCTION**

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
  - 1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
  - 2. Owner will furnish an instructor to describe Owner's operational philosophy.
  - 3. Owner will furnish Contractor with names and positions of participants.
- B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
  - 1. Schedule training with Owner with at least seven days' advance notice.
- C. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.

### **3.03 DEMONSTRATION AND TRAINING VIDEO RECORDINGS**

- A. Pre-Produced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

**END OF SECTION**



**SECTION 05 40 00**  
**COLD-FORMED METAL FRAMING**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Exterior non-load-bearing wall framing.
  - 2. Soffit framing.
  - 3. Interior non-load-bearing wall framing exceeding height limitations of standard, nonstructural metal framing.

**1.02 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings:
  - 1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
  - 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
- C. Delegated-Design Submittal: For cold-formed steel framing for non-load bearing exterior stud walls.

**1.04 INFORMATIONAL SUBMITTALS**

- A. Welding certificates.
- B. Product certificates.
- C. Product test reports.
- D. Evaluation Reports: For post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

## **1.05 QUALITY ASSURANCE**

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."
- B. Mockups: Provide cold-formed metal framing and accessories required to construct integrated exterior mockup specified in Division 01 Section "Mockups."

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  - 1. AllSteel & Gypsum Products, Inc.
  - 2. ClarkDietrich Building Systems.
  - 3. MarinoWARE.
  - 4. SCAFCO Steel Stud Company.
  - 5. Steel Network, Inc. (The).
  - 6. Steeler, Inc.

### **2.02 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design cold-formed steel framing.
- B. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.
  - 1. Design Loads: As indicated on Drawings.
  - 2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
    - a. Exterior Non-Load-Bearing Framing: Horizontal deflection of 1/270 of the wall height.
  - 3. Design framing systems to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
  - 4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:

- a. Upward and downward movement of 3/4 inch.
- 5. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.
- C. Cold-Formed Steel Framing Standards: Unless more stringent requirements are indicated, framing shall comply with AISI S100, AISI S200, and the following:
  - 1. Wall Studs: AISI S211.
  - 2. Headers: AISI S212.
  - 3. Lateral Design: AISI S213.

### **2.03 COLD-FORMED STEEL FRAMING MATERIALS**

- A. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:
  - 1. Grade: As required by structural performance.
  - 2. Coating: G60, A60, AZ50, or GF30.
- B. Steel Sheet for Vertical Deflection Clips: ASTM A653/A653M, structural steel, zinc coated, of grade and coating as follows:
  - 1. Grade: As required by structural performance.
  - 2. Coating: G60.

### **2.04 EXTERIOR NON-LOAD-BEARING WALL FRAMING**

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
  - 1. Minimum Base-Metal Thickness: 0.0677 inch.
  - 2. Minimum Flange Width: 1-5/8 inches.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and matching minimum base-metal thickness of steel studs.
- C. Vertical Deflection Clips: Manufacturer's standard bypass or head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
- D. Single Deflection Track: 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 loads and transfer them to the primary structure.

- E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.

## **2.05 SOFFIT FRAMING**

- A. Exterior Soffit Frame: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:
  - 1. Minimum Base-Metal Thickness: 0.0677 inch.

## **2.06 FRAMING ACCESSORIES**

- A. Fabricate steel-framing accessories from ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated.

## **2.07 ANCHORS, CLIPS, AND FASTENERS**

- A. Steel Shapes and Clips: ASTM A 6/A36M, zinc coated by hot-dip process according to ASTM A123/A123M.
- B. Anchor Bolts: ASTM F1554, Grade 36, threaded carbon-steel hex-headed bolts or headless, hooked bolts, carbon-steel nuts, and flat, hardened-steel washers; zinc coated by mechanically deposition according to ASTM B695, Class 50.
- C. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 or ICC-ES AC193 as appropriate for the substrate.
  - 1. Uses: Securing cold-formed steel framing to structure.
  - 2. Type: Torque-controlled expansion anchor, torque-controlled adhesive anchor, or adhesive anchor.
  - 3. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.
  - 4. Material for Exterior or Interior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.
- D. Power-Actuated Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- E. Mechanical Fasteners: ASTM C 513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.

1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.

## **2.08 MISCELLANEOUS MATERIALS**

- A. Galvanizing Repair Paint: ASTM A 80/A780M.
- B. Cement Grout: Portland cement, ASTM C150/C150M, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
- C. Nonmetallic, Nonshrink Grout: Factory-packaged, nonmetallic, noncorrosive, nonstaining grout, complying with ASTM C 1107/C 1107M, and with a fluid consistency and 30-minute working time.
- D. Shims: Load-bearing, high-density, multimer, nonleaching plastic; or cold-formed steel of same grade and metallic coating as framing members supported by shims.

## **PART 3 - EXECUTION**

### **3.01 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 required to obtain fire-resistance ratings indicated. Protect remaining fire-resistive materials from damage.

### **3.02 INSTALLATION, GENERAL**

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
- D. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- E. Install temporary bracing and supports to secure framing and support loads equal 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.

- F. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- G. Install insulation, specified in Division 07 Section "Thermal Insulation," in framing-assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- H. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

### **3.03 EXTERIOR NON-LOAD-BEARING WALL INSTALLATION**

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.
- B. Fasten both flanges of studs to bottom track unless otherwise indicated. Space studs as follows:
  - 1. Stud Spacing: As indicated on Drawings.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. 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. Install double deep-leg deflection tracks and anchor outer track to building structure.
  - 3. Connect vertical deflection clips to bypassing studs and anchor to building structure.
  - 4. Connect drift clips to cold-formed steel framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.
  - 1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
  - 2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
  - 3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 18 inches of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.

1. Install solid blocking at centers indicated on Shop Drawings.
- G. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

### **3.04 ERECTION TOLERANCES**

- A. Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

### **3.05 FIELD QUALITY CONTROL**

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Cold-formed steel framing will be considered defective if it does not pass tests and inspections.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

### **3.06 REPAIRS AND PROTECTION**

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

**END OF SECTION**

**SECTION 05 50 00**  
**METAL FABRICATIONS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
1. Steel framing and supports for applications where framing and supports are not specified in other Sections.
  2. Metal ladders for interior applications.
  3. Metal bollards.
  4. Metal downspout boots.
- B. Products furnished, but not installed, under this Section include the following:
1. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
  2. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

**1.02 COORDINATION**

- A. Coordinate installation of metal fabrications that are anchored to or that receive other work. 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.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For the following:
1. Fasteners.
  2. Shop primers.
  3. Shrinkage-resisting grout.
  4. Metal ladders.
  5. Metal bollards.
- B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.



- C. Delegated-Design Submittal: For ladders, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### **1.04 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For professional engineer's experience with providing delegated-design engineering services of the kind indicated, including documentation that engineer is licensed in the jurisdiction in which Project is located.
- B. Welding certificates.

#### **1.05 QUALITY ASSURANCE**

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
  - 3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

#### **1.06 FIELD CONDITIONS**

- A. Field Measurements: Verify actual locations of walls, floor slabs, decks, and other construction contiguous with metal fabrications by field measurements before fabrication.

### **PART 2 - PRODUCTS**

#### **2.01 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Engage a qualified professional engineer, as defined in Division 01 Section "Quality Requirements," to design ladders.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

#### **2.02 METALS**

- 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.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

- C. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- D. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless otherwise indicated.
- E. Cast Iron: Either gray iron, ASTM A48/A48M, or malleable iron, ASTM A47/A47M, unless otherwise indicated.
- F. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
  - 1. Size of Channels: 1-5/8 by 1-5/8 inches.
  - 2. Material: Galvanized steel, ASTM A653/A653M, commercial steel, Type B, with G90 coating; 0.079-inch nominal thickness.

### **2.03 FASTENERS**

- A. General: Unless otherwise indicated, provide Type 304 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.
- C. Stainless Steel Bolts and Nuts: Regular hexagon-head annealed stainless steel bolts, ASTM F593; with hex nuts, ASTM F594; and, where indicated, flat washers; Alloy Group 1.
- D. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.
  - 1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- E. Anchors, General: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.
- F. Cast-in-Place Anchors in Concrete: Either threaded or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F2329/F2329M.
- G. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless steel bolts, ASTM F593, and nuts, ASTM F594.

#### **2.04 MISCELLANEOUS MATERIALS**

- A. Shop Primers: Provide primers that comply with Division 09 painting sections.
- B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- C. Shrinkage-Resistant Grout: Factory-packaged, nonmetallic, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- D. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained concrete with a minimum 28-day compressive strength of 3000 psi.

#### **2.05 FABRICATION, GENERAL**

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
  1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  2. Obtain fusion without undercut or overlap.
  3. Remove welding flux immediately.
  4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips

flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

## **2.06 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.
  - 1. Fabricate units from slotted channel framing where indicated.
  - 2. Furnish inserts for units installed after concrete is placed.
- C. Galvanize miscellaneous framing and supports where indicated.
- D. Prime miscellaneous framing and supports with zinc-rich primer where indicated.

## **2.07 METAL LADDERS**

- A. General: Comply with ANSI A14.3.
- B. Steel Ladders: Unless otherwise indicated, fabricate ladders as follows:
  - 1. Space siderails 16 inches apart unless otherwise indicated.
  - 2. Siderails: Continuous, 3/8-by-2-1/2-inch steel flat bars, with eased edges.
  - 3. Rungs: 3/4-inch-diameter, steel bars.
  - 4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
  - 5. Support each ladder at top and bottom and not more than 60 inches o.c..
  - 6. Shop prime.

## 2.08 METAL BOLLARDS

- A. Fabricate metal bollards from Schedule 80 steel pipe.
- B. Hot-dip galvanize steel bollards.

## 2.09 METAL DOWNSPOUT BOOTS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  - 1. J.R. Hoe & Sons Inc.
  - 2. Neenah Foundry Company.
- B. Source Limitations: Obtain downspout boots from single source from single manufacturer.
- C. Provide downspout boots made from cast iron in heights indicated with inlets of size and shape to suit downspouts. Provide units with flanges and holes for countersunk anchor bolts.
  - 1. Outlet: Vertical, to discharge into pipe.
- D. Prime cast-iron downspout boots with [zinc-rich primer.] [primer specified in Section 099600 "High-Performance Coatings."]

## 2.10 GENERAL FINISH REQUIREMENTS

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

## 2.11 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.
  - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
  - 1. Shop prime with universal shop primer unless indicated.

- C. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
  - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

### **PART 3 - EXECUTION**

#### **3.01 INSTALLATION, GENERAL**

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

#### **3.02 INSTALLATION OF 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. Anchor supports for overhead doors securely to, and rigidly brace from, building structure.

### **3.03 INSTALLATION OF METAL BOLLARDS**

- A. Fill bollards solidly with concrete, mounding top surface to shed water.

### **3.04 REPAIRS**

- A. Touchup Painting:
  - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
    - a. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

**END OF SECTION**

**SECTION 06 10 53**  
**MISCELLANEOUS ROUGH CARPENTRY**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
1. Wood blocking and nailers.
  2. Plywood backing panels.

**1.02 DEFINITIONS**

- A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal or greater size but less than 5 inches nominal size in least dimension.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
  2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
  3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
  4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

**1.04 INFORMATIONAL SUBMITTALS**

- A. Evaluation Reports: For the following, from ICC-ES:
1. Preservative-treated wood.
  2. Fire-retardant-treated wood.



## **PART 2 - PRODUCTS**

### **2.01 WOOD PRODUCTS, GENERAL**

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

### **2.02 WOOD-PRESERVATIVE-TREATED MATERIALS**

- A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2.
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat items indicated on Drawings, and wood blocking and similar concealed members in contact with masonry or concrete.

### **2.03 FIRE-RETARDANT-TREATED MATERIALS**

- A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
  - 1. Treatment shall not promote corrosion of metal fasteners.

2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
- C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
- E. Application: Treat items indicated on Drawings, and the following:
  1. Concealed blocking.
  2. Plywood backing panels.

#### **2.04 MISCELLANEOUS LUMBER**

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  1. Blocking.
  2. Nailers.
- B. Dimension Lumber Items: Standard, Stud, or No. 3 grade lumber of any species.
- C. Concealed Boards: 19 percent maximum moisture content of any of the following species and grades:
  1. Mixed southern pine or southern pine, No. 3 grade; SPIB.
  2. Western woods, Standard or No. 3 Common grade; WCLIB or WWPA.
- D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

#### **2.05 PLYWOOD BACKING PANELS**

- A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, C-C Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

## **2.06 FASTENERS**

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
  - 1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Screws for Fastening to Metal Framing: ASTM C 1002, length as recommended by screw manufacturer for material being fastened.
- D. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

## **2.07 MISCELLANEOUS MATERIALS**

- A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION, GENERAL**

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.
- D. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
  - 1. Provide metal clips for fastening gypsum board at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.

- E. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- F. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
  - 2. FM Global Property Loss Prevention Data Sheet 1-49 for wood blocking and nailers at roofing and flashing.
  - 3. ICC-ES evaluation report for fastener.
- G. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

### **3.02 WOOD BLOCKING AND NAILER INSTALLATION**

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

### **3.03 PROTECTION**

- A. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

**END OF SECTION**

**SECTION 06 16 00**  
**SHEATHING**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes wall sheathing.

**1.02 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

**1.04 QUALITY ASSURANCE**

- A. Mockups: Provide sheathing and accessories required to construct integrated exterior mockup specified in Division 01 Section "Mockups."

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

**PART 2 - PRODUCTS**

**2.01 WALL SHEATHING**

- A. Glass-Mat Gypsum Sheathing: ASTM C 1177/1177M.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
    - a. CertainTeed Corporation; GlasRoc.
    - b. Georgia-Pacific Gypsum LLC; Dens-Glass Gold.
    - c. National Gypsum Company; Gold Bond eXP Extended Exposure Sheathing.

- d. USG Corporation; Securock.
- 2. Type and Thickness: Type X, 5/8 inch thick.

## **2.02 FASTENERS**

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
  - 1. For wall sheathing, 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: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- D. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached.
  - 1. For steel framing less than 0.0329 inch thick, use screws that comply with ASTM C 1002.
  - 2. For steel framing from 0.033 to 0.112 inch thick, use screws that comply with ASTM C 954.

## **2.03 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS**

- A. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C 834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.
  - 1. Sheathing Tape: Self-adhering glass-fiber tape, minimum 2 inches wide, 10 by 10 or 10 by 20 threads/inch, of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION, GENERAL**

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
  - 2. ICC-ES evaluation report for fastener.
- D. Coordinate wall 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 assembly.
- E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

### **3.02 GYPSUM SHEATHING INSTALLATION**

- A. Comply with GA-253 and with manufacturer's written instructions.
  - 1. Fasten gypsum sheathing to cold-formed metal framing with screws.
  - 2. Install panels with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
  - 3. Install panels with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
- B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.
- C. 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 panels without forcing. Abut ends over centers of studs, and stagger end joints of adjacent panels not less than one stud spacing. Attach at perimeter and within field of panel to each stud.
  - 1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of panels.
  - 2. For sheathing under stucco cladding, panels may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.
- D. Vertical Installation: Install vertical edges centered over studs. Abut ends and edges with those of adjacent panels. Attach at perimeter and within field of panel to each stud.
  - 1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of panels.

2. For sheathing under stucco cladding, panels may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.
- E. Seal sheathing joints according to sheathing manufacturer's written instructions.
1. Apply elastomeric sealant to joints and fasteners and trowel flat. Apply sufficient amount of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.
  2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.
  3. Joint treatment may be omitted upon written recommendation of manufacturer of air barrier materials.

**END OF SECTION**



**SECTION 06 41 16**  
**PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Plastic-laminate-faced architectural cabinets.
  - 2. Grommets and other accessories as indicated on Drawings.
  - 3. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-faced architectural cabinets unless concealed within other construction before cabinet installation.
- B. Related Sections include Division 12 sections for countertops installed over plastic-laminate-faced architectural cabinets.

**1.02 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product, including panel products, high-pressure decorative laminate, and cabinet hardware and accessories.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
  - 1. Show details full size.
  - 2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
  - 3. Show locations and sizes of cutouts and holes for electrical switches and outlets and other items installed in architectural plastic-laminate cabinets.
- C. Samples for Verification:
  - 1. Plastic laminates, 8 by 10 inches, for each color, pattern, and surface finish, with one sample applied to core material and specified edge material applied to one edge.
  - 2. Corner pieces as follows:
    - a. Cabinet-front frame joints between stiles and rails, as well as exposed end pieces, 18 inches high by 18 inches wide by 6 inches deep.

3. Exposed cabinet hardware and accessories, one unit for each type and finish.
4. Grommets, one unit for each type and finish.

#### **1.04 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.

#### **1.05 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Shop that employs skilled workers with five year's experience fabricating custom products similar to those required for this Project and whose products have a record of successful in-service performance.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Do not deliver cabinets until painting and similar operations that could damage woodwork have been completed in installation areas. If cabinets must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

#### **1.07 FIELD CONDITIONS**

- A. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 43 and 70 percent during the remainder of the construction period.
- B. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

#### **1.08 COORDINATION**

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that cabinets can be supported and installed as indicated.

## PART 2 - PRODUCTS

### 2.01 PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

- A. Quality Standard: Unless otherwise indicated, comply with the “Architectural Woodwork Standards” for grades of architectural plastic-laminate cabinets indicated for construction, finishes, installation, and other requirements.
  - 1. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.
- B. Grade: Premium.
- C. Type of Construction: As indicated.
- D. Cabinet, Door, and Drawer Front Interface Style: As indicated.
- E. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by woodwork quality standard.
  - 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. Abet Laminati Inc.
    - b. Formica Corporation.
    - c. Lamin-Art, Inc.
    - d. Pionite; a Panolam Industries International, Inc. brand.
    - e. Wilsonart International Holdings, Inc.
- F. Laminate Cladding for Exposed Surfaces:
  - 1. Horizontal Surfaces: Grade HGS.
  - 2. Vertical Surfaces: Grade VGS.
  - 3. Edges: Grade HGS.
- G. Materials for Semiexposed Surfaces:
  - 1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, NEMA LD 3, Grade VGS.
    - a. Edges of Plastic-Laminate Shelves: PVC edge banding, 3.0 mm thick, matching laminate in color, pattern, and finish.
    - b. For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, NEMA LD 3, Grade VGS.
  - 2. Drawer Sides and Backs: Thermally fused laminate panels with PVC or polyester edge banding.

3. Drawer Bottoms: Thermally fused laminate panels.
- H. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, NEMA LD 3, Grade BKL.
- I. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
  1. Join subfronts, backs, and sides with glued dovetail joints.
- J. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces as indicated by laminate manufacturer's designations or if not indicated as selected by Architect from laminate manufacturer's full range of solid colors, matte finish.

## **2.02 WOOD MATERIALS**

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
  1. Wood Moisture Content: 8 to 13 percent.
- B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
  1. Medium-Density Fiberboard: ANSI A208.2, Grade 130.
  2. Particleboard: Not permitted.
  3. Softwood Plywood: DOC PS 1.

## **2.03 CABINET HARDWARE AND ACCESSORIES**

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Division 08 Section "Door Hardware (Descriptive Specification)."
- B. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Division 08 Section "Door Hardware."
  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. Accuride International.
    - b. Blum, Julius & Co., Inc.
    - c. C.R. Laurence Co., Inc.
    - d. Grass America Inc.

- e. Hafele.
  - f. Knape & Vogt Manufacturing Company.
  - g. Stanley Manufacturing Co.
- C. Frameless Concealed Hinges (European Type): ANSI/BHMA A156.9, B01602, 135 degrees of opening, self-closing.
- D. Wire Pulls: Back mounted, solid metal, 4 inches long, 5/16 inch in diameter.
- E. Catches: Roller catches, BHMA A156.9, B03071.
- F. Shelf Rests: BHMA A156.9, B04013; metal, two-pin type with shelf hold-down clip.
- G. Drawer Slides: BHMA A156.9.
- 1. Grade 1 and Grade 2: Side mounted and extending under bottom edge of drawer; full-extension type; epoxy-coated steel with polymer rollers.
  - 2. Grade 1HD-100 and Grade 1HD-200: Side mounted; full-overtravel-extension type; zinc-plated-steel ball-bearing slides.
  - 3. For drawers not more than 6 inches high and not more than 24 inches wide, provide Grade 1.
  - 4. For drawers more than 6 inches high or more than 24 inches wide, provide Grade 1HD-100.
- H. Door and Drawer Silencers: BHMA A156.16, L03011.
- I. Grommets for Cable Passage: 2-inch OD, molded-plastic grommets and matching plastic caps with slot for wire passage.
- 1. Manufacturer: Subject to compliance with requirements, provide grommets by Doug Mockett & Company or manufacturer of comparable products approved by Architect.
  - 2. Color: As selected by Architect from manufacturer's full range of colors.
- J. 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.
  - 2. Satin Stainless Steel: BHMA 630.
- K. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

## **2.04 MISCELLANEOUS MATERIALS**

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.

- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

## **2.05 FABRICATION**

- A. Fabricate cabinets and panels to dimensions, profiles, and details indicated.
- B. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
  - 1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
  - 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.
- C. Shop-cut openings to maximum extent possible to receive hardware, appliances, 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.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.
- B. Before installing cabinets, examine shop-fabricated work for completion and complete work as required.

### **3.02 INSTALLATION**

- A. Grade: Install cabinets to comply with same grade as item to be installed.
- B. Assemble cabinets and complete fabrication at Project site to the extent that it was not completed in the shop.
- C. Install cabinets level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.

- D. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.
  - 1. Use filler matching finish of items being installed.
- F. 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.
  - 1. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
  - 2. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c. with toggle bolts through metal backing or metal framing behind wall finish.

### **3.03 ADJUSTING AND CLEANING**

- A. Repair damaged and defective cabinets, 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 cabinets on exposed and semiexposed surfaces.

**END OF SECTION**

**SECTION 06 64 00**  
**PLASTIC PANELING**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes plastic sheet paneling.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Samples: For plastic paneling, in manufacturer's standard sizes.

**1.03 PROJECT CONDITIONS**

- A. Environmental Limitations: Do not deliver or install plastic paneling until spaces are enclosed and weathertight and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

**PART 2 - PRODUCTS**

**2.01 MANUFACTURERS**

- A. Source Limitations: Obtain plastic paneling and trim accessories from single manufacturer.

**2.02 PLASTIC SHEET PANELING**

- A. Glass-Fiber-Reinforced Plastic Paneling: Gelcoat-finished, glass-fiber-reinforced plastic panels complying with ASTM D 5319.
  - 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. Crane Composites, Inc.
    - b. Glasteel.
    - c. Marlite.
    - d. Newcourt, Inc.



- e. Nudo Products, Inc.
  - f. Parkland Plastics, Inc.
2. Surface-Burning Characteristics: As follows when tested by a qualified testing agency according to ASTM E 84. Identify products with appropriate markings of applicable testing agency.
- a. Flame-Spread Index: 25 or less.
  - b. Smoke-Developed Index: 450 or less.
3. Nominal Thickness: Not less than 0.075 inch.
4. Surface Finish: Smooth.
5. Color: White.

### **2.03 ACCESSORIES**

- A. Adhesive: As recommended by plastic paneling manufacturer.
- B. Sealant: Mildew-resistant, single-component, neutral-curing silicone sealant recommended by plastic paneling manufacturer and complying with requirements in Division 07 Section "Joint Sealants."

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Clean substrates of substances that could impair adhesive bond, including oil, grease, dirt, and dust.
- B. Condition panels by unpacking and placing in installation space before installation according to manufacturer's written recommendations.
- C. Lay out paneling before installing. Locate panel joints to provide equal panels at ends of walls not less than half the width of full panels unless otherwise indicated.
  - 1. Mark plumb lines on substrate at panel joint locations for accurate installation.
  - 2. Locate panel joints to allow clearance at panel edges according to manufacturer's written instructions.

**3.03 INSTALLATION**

- A. Install plastic paneling according to manufacturer's written instructions.
- B. Install panels in a full spread of adhesive.
- C. Maintain uniform space between adjacent panels and between panels and floors, ceilings, and fixtures. Fill space with sealant.
- D. Remove excess sealant and smears as paneling is installed. Clean with solvent recommended by sealant manufacturer and then wipe with clean dry cloths until no residue remains.

**END OF SECTION**

**SECTION 07 21 00**  
**THERMAL INSULATION**

**PART 1 - GENERAL**

**1.01 SUMMARY**

A. Section includes:

1. Glass-fiber blanket insulation.
2. Mineral wool board insulation.
3. Polyisocyanurate foam-plastic board insulation.

B. Related Sections include:

1. Division 07 Section "Thermoplastic-Polyolefin (TPO) Roofing" for polyisocyanurate foam-plastic board insulation used as roof insulation.
2. Division 09 Section "Gypsum Board" for sound attenuation blanket used as acoustic insulation.

**1.02 ACTION SUBMITTALS**

A. Product Data: For each type of product.

**1.03 DELIVERY, STORAGE, AND HANDLING**

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, 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**

**2.01 GLASS-FIBER BLANKET**

A. Glass-Fiber Blanket, Unfaced: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. CertainTeed Corporation.
  - b. Johns Manville; a Berkshire Hathaway company.
  - c. Knauf Insulation.
  - d. Owens Corning.

## **2.02 MINERAL-WOOL BOARD**

- A. Mineral-Wool Board, Types IA and IB, Unfaced: ASTM C 612, Types IA and IB; with maximum flame-spread and smoke-developed indexes of 15 and zero, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics. Nominal density of 4 lb/cu. ft.
  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. Johns Manville; a Berkshire Hathaway company.
    - b. Owens Corning.
    - c. ROCKWOOL.

## **2.03 POLYISOCYANURATE FOAM-PLASTIC BOARD**

- A. Polyisocyanurate Board, Glass-Fiber-Mat Face: ASTM C 1289, glass-fiber-mat faced, Type II, Class 2.
  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. Atlas Roofing Corporation.
    - b. Carlisle Coatings & Waterproofing Inc.
    - c. Firestone Building Products.
    - d. Hunter Panels.
    - e. Rmax, Inc.
- B. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

## **2.04 ACCESSORIES**

- A. Insulation for Miscellaneous Voids: Glass-fiber insulation complying with ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.

- B. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

### **PART 3 - EXECUTION**

#### **3.01 PREPARATION**

- A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

#### **3.02 INSTALLATION, GENERAL**

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

#### **3.03 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION**

- A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
  - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
  - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
  - 3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
  - 4. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically.
- B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.

### **3.04 INSTALLATION OF CONTINUOUS WALL INSULATION**

- A. Mineral Wool Board Insulation: Install pads of adhesive spaced approximately 24 inches o.c. both ways on inside face and as recommended by manufacturer. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates.

### **3.05 PROTECTION**

- A. Protect installed insulation 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**

**SECTION 07 26 16**  
**UNDER-SLAB VAPOR RETARDER**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes vapor retarders for installation under concrete slabs on grade.

**1.02 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.03 ACTION SUBMITTALS**

- A. Product Data: Include manufacturer's written instructions for installation, seaming, of vapor retarder. Include details for installing vapor retarders under conditions applicable to existing conditions.
- B. Shop Drawings: Show locations and extent of under-slab vapor retarders.
- C. Samples: For each product specified

**1.04 QUALITY ASSURANCE**

- A. Installer Qualifications: A firm experienced in installing under-slab vapor retarder materials 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.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Store rolls according to manufacturer's written instructions.
- B. Protect stored materials from direct sunlight.

**1.06 PROJECT CONDITIONS**

- A. Environmental Limitations: Apply vapor retarder materials within the range of ambient and substrate temperatures recommended by manufacturer of vapor retarder materials. Protect substrates from environmental conditions that affect performance of vapor retarder.

## **PART 2 - PRODUCTS**

### **2.01 PLASTIC SHEET VAPOR RETARDERS**

- A. Vapor Retarder Sheet: Plastic sheet recommended by manufacturer for use as a vapor barrier retarder when installed on prepared subgrade before placing steel-reinforced concrete slabs on grade and meeting the requirements for Class A vapor retarders when tested according to ASTM E 1745.
  - 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. Barrier-Bac.
    - b. Insulation Solutions, Inc.
    - c. Raven Industries Inc.
    - d. Stego Industries, LLC.
    - e. Tex-Trude, LP.
  - 2. Minimum Thickness: 15 mils.
  - 3. Permeance: Not more than 0.010 perms when tested according to ASTM E 2149 or E 154.

### **2.02 AUXILIARY MATERIALS**

- A. Seam tape, adhesives, pipe boots, detail strips with vapor permeance not less than the membrane, as require by manufacturer.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. General: Comply with ASTM E 1643 and manufacturer's written instructions for substrate preparation and sheet vapor retarder installation, protection, and repair.
- B. Place vapor retarder sheet over exposed compacted soil. Touch edges under existing slab and seal according to manufacturer's recommendations.
- C. Do not allow penetration of vapor retarder except for reinforcing steel and permanent utilities, which are to be sealed.
  - 1. Seal membrane penetrations as required by manufacturer.
- D. Repair tears, voids, and lapped seams in vapor retarder not complying with requirements. Slit and flatten fishmouths and blisters. Patch with vapor retarder and tape extending beyond repaired areas in all directions.



**3.02 PROTECTION**

- A. Protect vapor retarder from damage during installation of reinforcing and utilities.
- B. Protect vapor retarder from damage and wear during remainder of construction period.
  - a. Structural to ASCE/SEI 7:

**END OF SECTION**

**SECTION 07 27 26**  
**FLUID-APPLIED MEMBRANE AIR BARRIERS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes vapor-retarding, fluid-applied air barriers.
- B. Related Sections include Division 06 Section "Sheathing" for wall sheathings and wall sheathing joint-and-penetration treatments.

**1.02 DEFINITIONS**

- A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.
- B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.
- C. Air-Barrier Assembly: The collection of air-barrier materials and accessories applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

**1.03 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review air-barrier requirements and installation, special details, mockups, air-leakage and bond testing, air-barrier protection, and work scheduling that covers air barriers.

**1.04 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include manufacturer's written instructions for evaluating, preparing, and treating each substrate; technical data; dry film thickness; and tested physical and performance properties of products.
- B. Shop Drawings: For air-barrier assemblies.
  - 1. Show locations and extent of air-barrier materials, accessories, and assemblies specific to Project conditions.

2. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
3. Include details of interfaces with other materials that form part of air barrier.

#### **1.05 INFORMATIONAL SUBMITTALS**

- A. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with the barrier.

#### **1.06 QUALITY ASSURANCE**

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Mockups: Provide fluid-applied membrane air barrier products and accessories required to construct integrated exterior mockup specified in Division 01 Section "Mockups."

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- B. Protect stored materials from direct sunlight.

#### **1.08 FIELD CONDITIONS**

- A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended in writing by air-barrier manufacturer.
  1. Protect substrates from environmental conditions that affect air-barrier performance.
  2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

### **PART 2 - PRODUCTS**

#### **2.01 MATERIALS**

- A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.

#### **2.02 PERFORMANCE REQUIREMENTS**

- A. Air-Barrier Performance: Air-barrier assembly and seals with adjacent construction shall be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of

sealing substrate expansion and control joints, construction material changes, penetrations, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

- B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., when tested according to ASTM E 2357.

### **2.03 HIGH-BUILD AIR BARRIERS, VAPOR RETARDING**

- A. High-Build, Vapor-Retarding Air Barrier: Synthetic polymer membrane with an installed dry film thickness, according to manufacturer's written instructions, of 35 mils or thicker over smooth, void-free substrates.

- 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

- a. Carlisle Coatings & Waterproofing Inc; Fire Resist Barritech NP.
- b. GCP Applied Technologies; Perm-A-Barrier Liquid.
- c. Henry Company; Air-Bloc 32MR.
- d. Hohmann & Barnard, Inc; Enviro-Barrier.
- e. Soprema, Inc.
- f. W. R. Meadows, Inc; Air-Shield LSR.

- 2. Physical and Performance Properties:

- a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E 2178.
- b. Vapor Permeance: Maximum 0.1 perm; ASTM E 96/E 96M, Desiccant Method.
- c. Ultimate Elongation: Minimum 500 percent; ASTM D 412, Die C.
- d. Adhesion to Substrate: Minimum 16 lbf/sq. in. when tested according to ASTM D 4541.
- e. UV Resistance: Can be exposed to sunlight for 90 days according to manufacturer's written instructions.

### **2.04 ACCESSORY MATERIALS**

- A. Requirement: Provide primers, transition strips, termination strips, joint reinforcing fabric and strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by air-barrier manufacturer to produce a complete air-barrier assembly and that are compatible with primary air-barrier material and adjacent construction to which they may seal.

- B. Primer: Liquid primer recommended for substrate by air-barrier material manufacturer.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
  - 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
  - 2. Verify that substrates have cured and aged for minimum time recommended in writing by air-barrier manufacturer.
  - 3. Verify that substrates are visibly dry and free of moisture.
  - 4. Verify that masonry joints are flush and completely filled with mortar.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 SURFACE PREPARATION**

- A. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate according to manufacturer's written instructions and details. Provide clean, dust-free, and dry substrate for air-barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching material.
- E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- F. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- G. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.
- H. Bridge isolation joints discontinuous wall-to-wall, deck-to-wall, and deck-to-deck joints with air-barrier accessory material that accommodates joint movement according to manufacturer's written instructions and details.

### 3.03 ACCESSORIES INSTALLATION

- A. Install accessory materials according to air-barrier manufacturer's written instructions and details to form a seal with adjacent construction and ensure continuity of air and water barrier.
  - 1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
  - 2. Install transition strip on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over each substrate.
  - 3. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
  - 4. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
- B. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- C. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.
- D. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- E. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames, with not less than 1 inch of full contact.
  - 1. Transition Strip: Roll firmly to enhance adhesion.
- F. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air-barrier material with foam sealant.
- G. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
- H. Seal top of through-wall flashings to air barrier with an additional 6-inch-wide, transition strip.
- I. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.

- J. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches beyond repaired areas in strip direction.

### **3.04 PRIMARY AIR-BARRIER MATERIAL INSTALLATION**

- A. Apply air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier according to air-barrier manufacturer's written instructions and details. Apply air-barrier material within manufacturer's recommended application temperature ranges.
  - 1. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
  - 2. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
  - 3. Where multiple prime coats are needed to achieve required bond, allow adequate drying time between coats.
- B. High-Build Air Barriers: Apply continuous unbroken air-barrier material to substrates according to the following thickness. Apply air-barrier material in full contact around protrusions such as masonry ties.
  - 1. Vapor-Retarding, High-Build Air Barrier: Total dry film thickness as recommended in writing by manufacturer to comply with performance requirements, but not less than 35 mils, applied in one or more equal coats.
- C. Do not cover air barrier until it has been tested and inspected by testing agency.
- D. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

### **3.05 FIELD QUALITY CONTROL**

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:
  - 1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
  - 2. Air-barrier dry film thickness.
  - 3. Continuous structural support of air-barrier system has been provided.
  - 4. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
  - 5. Site conditions for application temperature and dryness of substrates have been maintained.
  - 6. Maximum exposure time of materials to UV deterioration has not been exceeded.

7. Surfaces have been primed, if applicable.
8. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
9. Termination mastic has been applied on cut edges.
10. Strips and transition strips have been firmly adhered to substrate.
11. Compatible materials have been used.
12. Transitions at changes in direction and structural support at gaps have been provided.
13. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
14. All penetrations have been sealed.

C. Tests: As determined by testing agency from among the following tests:

1. Air-Leakage-Volume Testing: Air-barrier assemblies will be tested for air-leakage rate according to ASTM E 783 or ASTM E 2357.
2. Adhesion Testing: Air-barrier assemblies will be tested for required adhesion to substrate according to ASTM D 4541 for each 600 sq. ft. of installed air barrier or part thereof.

D. Air barriers will be considered defective if they do not pass tests and inspections.

1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
2. Remove and replace deficient air-barrier components for retesting as specified above.

E. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.

F. Prepare test and inspection reports.

### **3.06 CLEANING AND PROTECTION**

A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.

1. Protect air barrier from exposure to UV light and harmful weather exposure as recommended in writing by manufacturer. If exposed to these conditions for longer than recommended, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed materials according to air-barrier manufacturer's written instructions.
2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.

B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended in writing by manufacturer of affected construction.



- C. Remove masking materials after installation.

**END OF SECTION**

**SECTION 07 42 13.23**  
**METAL COMPOSITE MATERIAL WALL PANELS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes metal composite material (MCM) panels.

**1.02 DEFINITIONS**

- A. MCM: Metal composite material; cladding material formed by joining two thin metal skins to polyethylene or fire-retardant core and bonded under precise temperature, pressure, and tension.

**1.03 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Meet with Owner, Architect, Owner's insurer if applicable, MCM system Installer, MCM system manufacturer's representative, and installers whose work interfaces with or affects MCM panels.
  - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 3. Review methods and procedures related to MCM system installation, including manufacturer's written instructions.
  - 4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
  - 5. Review temporary protection requirements for system assembly during and after installation.
  - 6. Review procedures for repair of panels damaged after installation.
  - 7. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

**1.04 ACTION SUBMITTALS**

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel, system, and accessory.
- B. Shop Drawings:

1. Include fabrication and installation layouts of MCM system; details of edge conditions, joints, panel profiles, corners, anchorages, attachment assembly, trim, flashings, closures, accessories, and special details.
  2. Accessories: Include details of flashing, trim, and anchorage, at a scale of not less than 1-1/2 inches per 12 inches.
- C. Samples for Initial Selection: For each type of MCM panel indicated, with factory-applied color finishes.
1. Size: Manufacturers' standard size.
  2. Include Samples of trim and accessories involving color selection.
- D. Samples for Verification: For each type of MCM panel and MCM system required, with factory-applied color finishes.
1. MCM Panel: One sample, 2 by 3 inches.
  2. MCM System: 12 inches long by actual panel width, fabricated into panel systems indicated. Include fasteners, closures, and other MCM panel accessories.

#### **1.05 INFORMATIONAL SUBMITTALS**

- A. Sample warranties.

#### **1.06 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For MCM panels.
- B. Warranty Documentation:
1. Manufacturers' special warranties.
  2. Installer's special warranties.

#### **1.07 QUALITY ASSURANCE**

- A. Qualifications:
1. Fabricator: Certified MCM fabricator by the Metal Construction Association.
  2. Installer: Fabricator of MCM system.
- B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects.
1. Build mockup as directed by Architect, including supports, attachments, and accessories.
  2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner specifically approves such deviations by Change Order.

3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver components, MCM panels, and other manufactured items so as not to be damaged or deformed. Package MCM panels for protection during transportation and handling.
- B. Unload, store, and erect MCM panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack MCM panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store MCM panels to ensure dryness, with positive slope for drainage of water. Do not store MCM panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on MCM panels during installation.

#### **1.09 FIELD CONDITIONS**

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of MCM panels to be performed in accordance with manufacturers' written instructions and warranty requirements.

#### **1.10 COORDINATION**

- A. Coordinate MCM panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

#### **1.11 WARRANTY**

- A. Panel Integrity Warranty: Manufacturer agrees to repair or replace components of MCM panels 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: Five years from date of Substantial Completion.
- B. Panel Finish Warranty: Manufacturer agrees to repair finish or replace MCM panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested in accordance with ASTM D2244.
    - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  2. Finish Warranty Period: 20 years from date of Substantial Completion.
- C. MCM System Warranty: Fabricator's standard form in which manufacturer agrees to repair or replace components of MCM systems that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Five years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. Structural Performance: MCM systems to withstand the effects of the following loads, based on testing in accordance with ASTM E330/E330M:
  1. Wind Loads: As indicated on Drawings.
  2. Deflection Limits: For wind loads, no greater than 1/180 of the span.
- B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested in accordance with ASTM E283/E283M at the following test-pressure difference:
  1. Test-Pressure Difference: 1.57 lbf/sq. ft.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
  1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

### **2.02 METAL COMPOSITE MATERIAL (MCM) WALL PANELS**

- A. Metal Composite Material (MCM) Wall and Soffit Panels: Provide MCM panels fabricated from two metal facings bonded to a solid, extruded thermoplastic core.
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. **[ALPOLIC Materials; Mitsubishi Chemical Composites; ALPOLIC/fr]**.
    - b. ALUCOBOND; 3A Composites USA, Inc; ALUCOBOND Plus.
    - c. Arconic; Reynobond FR.

2. Core: [FR].
3. Panel Thickness: 0.157 inch.
4. Bond Strength: 22.5 in-lb/in. when tested for bond integrity in accordance with ASTM D1781.
5. Fire Performance: Flame-spread index less than 25 and smoke-developed index less than 450, in accordance with ASTM E84 or UL 723.

B. MCM Panel Materials:

1. Aluminum-Faced Panels: ASTM B209 alloy as standard with manufacturer, temper as required to suit finish and forming operations with 0.020-inch- thick, aluminum sheet facings.
  - a. Exterior Finish: Two-coat fluoropolymer.
    - 1) Color: As selected by Architect from manufacturer's standard range of colors.

### 2.03 METAL COMPOSITE MATERIAL (MCM) SYSTEM

- A. **[Dry-Seal Barrier MCM System:** ]Provide factory-formed and -assembled, MCM panels formed into profile for dry-seal barrier system installation. Include attachment assembly components, panel stiffeners, and accessories required for weathertight system.
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. ALUCOBOND; 3A Composites USA, Inc.
    - b. Citadel Architectural Products, Inc.
    - c. NOW Specialties, Inc.
    - d. Sobotec Ltd.
  - B. System Panel Depth: As indicated on drawings.
  - C. Attachment Assembly Components: Manufacturer's standard formed from extruded aluminum.
  - D. Labeling: Comply with labeling requirement of applicable building code.
  - E. Continuous Soffit Vents: Aluminum, hat-channel shape, with perforations; **2 inches** wide and not less than **96 inches** long.

### 2.04 ACCESSORIES

- A. Metal Subframing and Furring: ASTM C955 cold-formed, metallic-coated steel sheet ASTM A653/A653M, G90 hot-dip galvanized coating designation or ASTM A792/A792M, Class AZ50 aluminum-zinc-alloy coating designation unless

otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of MCM system.

- B. System Accessories: Provide components required for a complete, weathertight wall and soffit system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of MCM panels unless otherwise indicated.
- C. Flashing and Trim: Provide flashing and trim formed from same material as MCM 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, sidewalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent MCM panels.
- D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Use gasketed or approved coated fasteners between dissimilar metals.
  - 1. Aluminum Panels: Use aluminum or stainless steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
- E. Panel Sealants: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in MCM panels and remain weathertight; and as recommended in writing by MCM system manufacturer.

## **2.05 FABRICATION**

- A. Fabricate and finish MCM panels at the factory, by panel manufacturer's standard procedures and processes, as necessary to fulfill indicated panel performance requirements demonstrated by laboratory testing.
- B. Shop-fabricate MCM systems and accessories by fabricator's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with requirements of MCM panel manufacturer, of indicated system profiles, and with dimensional and structural requirements.
  - 1. Fabricate panels to dimensions indicated on Drawings based on an assumed design temperature of 70 deg F. Allow for ambient temperature range at time of fabrication.
  - 2. Formed MCM panel lines, breaks, and angles to be sharp and straight, with surfaces free from warp or buckle.
  - 3. Fabricate panels with sharply cut edges and no displacement of face sheet or protrusion of core.
  - 4. Fabricated Panel Tolerances: Shop-fabricate panels to sizes and joint configurations indicated on Drawings.
    - a. Width: Plus or minus 0.079 inch at 70 deg F.
    - b. Length: Plus or minus 0.079 inch at 70 deg F.
    - c. Squareness: Plus or minus 0.079 inch at 70 deg F.

5. Fabricate MCM 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.
  6. Attach routed-and-turned panel flanges to perimeter extrusions with manufacturer's standard fasteners.
- C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions 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.
  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 manufacturer.
    - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal manufacturer for application, but not less than thickness of metal being secured.

## **2.06 FINISHES**

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Coil-Coated Aluminum Finish: Metallic fluoropolymer complying with AAMA 2605; a two-coat 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 manufacturers' written instructions.



## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, MCM system supports, and other conditions affecting performance of the Work.
  - 1. Examine wall and soffit framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by MCM system 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 MCM system 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 MCM system to verify actual locations of penetrations relative to seam locations of MCM panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION OF MCM SYSTEM**

- A. General: Install MCM system in accordance with system manufacturer's written instructions in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to supports unless otherwise indicated. Anchor MCM system securely in place, with provisions for thermal and structural movement.
  - 1. Shim or otherwise plumb substrates receiving MCM system.
  - 2. Flash and seal MCM system at perimeter of all openings. Fasten with self-tapping screws.
  - 3. Install screw fasteners in predrilled holes.
  - 4. Locate and space fastenings in uniform vertical and horizontal alignment.
  - 5. Install flashing and trim as MCM system work proceeds.
  - 6. Provide weathertight escutcheons for all items penetrating system.
  - 7. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by MCM system manufacturer.
  - 8. Attach MCM panels to supports at locations, spacings, and with fasteners recommended by manufacturer to meet listed performance requirements.
- B. Attachment Assembly, General: Install attachment assembly required to support MCM panels and to provide a complete weathertight wall system, including tracks, drainage channels, anchor channels, perimeter extrusions.

1. Install subframing, furring, and other panel support members and anchorages in accordance with ASTM C955.
  2. Install support system at locations, at spacings, and with fasteners recommended by MCM system manufacturer to meet listed performance requirements.
- C. **[Dry-Seal MCM System: ]** Attach MCM panels by interlocking panel clips into in a sequential series.
1. Seal horizontal and vertical joints between adjacent MCM panels with manufacturer's standard gaskets.
- D. Install panels to allow individual panels to “free float” and be installed and removed without disturbing adjacent panels.
- E. Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install accessory components required for a complete MCM system assembly including trim, copings, corners, seam covers, flashings, sealants, fillers, closure strips, and similar items. Provide types indicated by MCM system manufacturer.
- F. 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.
1. Install exposed flashing and trim that is without buckling and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install trim to fit substrates and to result in waterproof performance.
  2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 ft. with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

### 3.03 INSTALLATION TOLERANCES

- A. Shim and align MCM panels within installed tolerance of 1/4 inch in 20 ft., non-accumulative, on level, plumb, and location lines as indicated, and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed MCM system installation, including accessories.
- C. MCM system will be considered defective if it does not pass test and inspections.

- D. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
- E. Prepare test and inspection reports.

**3.04 CLEANING**

- A. Remove temporary protective coverings and strippable films as MCM panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, clean finished surfaces as recommended by MCM panel manufacturer. Maintain in a clean condition during construction.
- B. After installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

**3.05 PROTECTION**

- A. Replace MCM panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

**END OF SECTION**

**SECTION 07 54 23**  
**THERMOPLASTIC-POLYOLEFIN (TPO) ROOFING**

**PART 1 - GENERAL**

**1.01 SUMMARY**

A. Section includes:

1. Adhered thermoplastic polyolefin (TPO) roofing system.
2. Roof insulation.
3. Cover board.
4. Walkways.

B. Related Sections include:

1. Section 061053 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking; and for wood-based, structural-use roof deck panels.
2. Section 072100 "Thermal Insulation" for insulation beneath the roof deck.
3. Section 076200 "Sheet Metal Flashing and Trim" for metal roof flashings and counterflashings.
4. Section 079200 "Joint Sealants" for joint sealants, joint fillers, and joint preparation.

**1.02 DEFINITIONS**

- A. Roofing Terminology: Definitions in ASTM D1079 and glossary in NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to Work of this Section.

**1.03 PREINSTALLATION MEETINGS**

A. Preinstallation Roofing Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, air barrier Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.

6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

#### **1.04 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:
  1. Layout and thickness of insulation.
  2. Base flashings and membrane termination details.
  3. Flashing details at penetrations.
  4. Tapered insulation layout, thickness, and slopes.
  5. Roof plan showing orientation of steel roof deck and orientation of roof membrane, fastening spacings, and patterns for mechanically fastened roofing system.
  6. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
  7. Tie-in with adjoining air barrier.
- C. Samples for Verification: For the following products:
  1. Roof membrane and flashings, of color required.
  2. Walkway pads or rolls, of color required.
- D. Wind Uplift Resistance Submittal: For roofing system, indicating compliance with wind uplift performance requirements.

#### **1.05 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer and manufacturer.
- B. Manufacturer Certificates:
  1. Performance Requirement Certificate: Signed by roof membrane manufacturer, certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
    - a. Submit evidence of compliance with performance requirements.
  2. Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.

- C. Product Test Reports: For roof membrane and insulation, for tests performed by a qualified testing agency, indicating compliance with specified requirements.
- D. Evaluation Reports: For components of roofing system, from ICC-ES.
  - 1. Fastener-pullout test results and manufacturer's revised requirements for fastener patterns.
- E. Field quality-control reports.
- F. Sample Warranties: For manufacturer's special warranties.

#### **1.06 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For roofing system to include in maintenance manuals.

#### **1.07 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: A qualified manufacturer that is listed in FM Approvals' RoofNav for roofing system identical to that used for this Project.
- B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
  - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

### **1.09 FIELD CONDITIONS**

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

### **1.10 WARRANTY**

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period without monetary limitation.
  - 1. Special warranty includes roof membrane, base flashings, roof insulation, fasteners, cover boards, and other components of roofing system.
  - 2. Warranty Period: 20 years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. General Performance: Installed roofing system and flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roof system and flashings shall remain watertight.
  - 1. Accelerated Weathering: Roof membrane shall withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
  - 2. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D3746, ASTM D4272, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.
- B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.
- C. Wind Uplift Resistance: Design roofing system to resist uplift pressures indicated on Structural Drawings when tested according to FM Approvals 4474, UL 580, or UL 1897:
- D. FM Approvals' RoofNav Listing: Roof membrane, base flashings, and component materials shall comply with requirements in FM Approvals 4450 or FM Approvals 4470 as part of a roofing system, and shall be listed in FM Approvals' RoofNav for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals Certification markings.

- E. Exterior Fire-Test Exposure: ASTM E108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

## **2.02 THERMOPLASTIC POLYOLEFIN (TPO) ROOFING**

- A. TPO Sheet: ASTM D6878/D6878M, internally fabric- or scrim-reinforced, fabric-backed TPO sheet.
  - 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. Carlisle SynTec Incorporated.
    - b. GAF.
    - c. GenFlex Roofing Systems.
    - d. Johns Manville; a Berkshire Hathaway company.
    - e. Versico Roofing Systems.
  - 2. Source Limitations: Obtain components for roofing system from roof membrane manufacturer or manufacturers approved by roof membrane manufacturer.
  - 3. Thickness: 80 mils, nominal.
  - 4. Exposed Face Color: White.

## **2.03 AUXILIARY ROOFING MATERIALS**

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with other roofing components.
  - 1. Adhesive and Sealants: Comply with VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: Manufacturer's standard unreinforced TPO sheet flashing, 55 mils thick, minimum, of same color as TPO sheet.
- C. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.
- D. Roof Vents: As recommended by roof membrane manufacturer.
  - 1. Size: Not less than 4-inch diameter.
- E. Bonding Adhesive: Manufacturer's standard, water based.
- F. Metal Termination Bars: Manufacturer's standard, predrilled stainless steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
- G. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roofing components to substrate, and acceptable to roofing system manufacturer.



- H. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

## **2.04 ROOF INSULATION**

- A. General: Preformed roof insulation boards manufactured or approved by TPO roof membrane manufacturer.
- B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.
  - 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. Atlas EPS; a Division of Atlas Roofing Corporation.
    - b. Carlisle SynTec Incorporated.
    - c. GAF.
    - d. Hunter Panels.
    - e. Johns Manville; a Berkshire Hathaway company.
    - f. Rmax, Inc.
  - 2. Compressive Strength: 20 psi.
  - 3. Size: 48 by 48 inches.
  - 4. Thickness:
    - a. Base Layer: 2-1/4 inches.
    - b. Upper Layer: As required to achieve R-value indicated.
- C. Tapered Insulation: Provide factory-tapered insulation boards for saddles and crickets.
  - 1. Material: Match roof insulation.
  - 2. Minimum Thickness: 1/4 inch.
  - 3. Slope: 1/2 inch per foot unless otherwise indicated on Drawings.

## **2.05 INSULATION ACCESSORIES**

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with other roofing system components.
- B. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
  - 1. Bead-applied, low-rise, one-component or multicomponent urethane adhesive.
- C. Cover Board: One of the following at the Contractor's option

1. Polyisocyanurate Cover Board: ASTM C1289 Type II, Class 4, Grade 1, 1/2-inch-thick, with a minimum compressive strength of 80 psi.
2. Gypsum Cover Board: ASTM C1177/C1177M, glass-mat, water-resistant gypsum board or ASTM C1278/C1278M fiber-reinforced gypsum board.
  - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    - 1) Georgia-Pacific Gypsum LLC.
    - 2) National Gypsum Company.
    - 3) USG Corporation.
  - b. Thickness: 1/2 inch.
  - c. Surface Finish: Factory primed.

## **2.06 WALKWAYS**

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads, approximately 3/16 inch thick and acceptable to roofing system manufacturer.
  1. Size: Approximately 36 by 60 inches.
  2. Color: Contrasting with roof membrane.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
  1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
  2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
  3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Section 053100 "Steel Decking."
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing system installation according to roofing system manufacturer's written instructions. Remove sharp projections.

- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

### **3.03 INSTALLATION OF ROOFING, GENERAL**

- A. Install roofing system according to roofing system manufacturer's written instructions, FM Approvals' RoofNav assembly requirements, and FM Global Property Loss Prevention Data Sheet 1-29.
- B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning Work on adjoining roofing.

### **3.04 INSTALLATION OF INSULATION**

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at end of workday.
- B. Comply with roofing system and roof insulation manufacturer's written instructions for installing roof insulation.
- C. Installation Over Metal Decking:
  - 1. Install base layer of insulation with joints staggered not less than 24 inches in adjacent rows.
    - a. Locate end joints over crests of decking.
    - b. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
    - c. Make joints between adjacent insulation boards not more than 1/4 inch in width.
    - d. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus 24 inches.
      - 1) Trim insulation so that water flow is unrestricted.
    - e. Fill gaps exceeding 1/4 inch with insulation.
    - f. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
    - g. Mechanically attach base layer of insulation using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to metal decks.
      - 1) Fasten insulation to resist specified uplift pressure at corners, perimeter, and field of roof.
  - 2. Install upper layers of insulation and tapered insulation with joints of each layer offset not less than 12 inches from previous layer of insulation.

- a. Staggered end joints within each layer not less than 24 inches in adjacent rows.
- b. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
- c. Make joints between adjacent insulation boards not more than 1/4 inch in width.
- d. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus 24 inches.
  - 1) Trim insulation so that water flow is unrestricted.
- e. Fill gaps exceeding 1/4 inch with insulation.
- f. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
- g. Adhere each layer of insulation to substrate using adhesive to resist specified uplift pressure at corners, perimeter, and field of roof.
  - 1) Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

### **3.05 INSTALLATION OF COVER BOARDS**

- A. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction.
  - 1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
  - 2. At internal roof drains, conform to slope of drain sump.
    - a. Trim cover board so that water flow is unrestricted.
  - 3. Cut and fit cover board tight to nailers, projections, and penetrations.
  - 4. Adhere cover board to substrate using adhesive according to specified uplift pressure at corners, perimeter, and field of roof.
    - a. Set cover board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

### **3.06 INSTALLATION OF ADHERED ROOFING**

- A. Adhere roof membrane over area to receive roofing according to roofing system manufacturer's written instructions.
- B. Unroll roof membrane and allow to relax before installing.
- C. Start installation of roofing in presence of roofing system manufacturer's technical personnel and Owner's testing and inspection agency.
- D. Accurately align roof membrane, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

- E. Fabric-Backed Roof Membrane Adhesive: Apply to substrate at rate required by manufacturer, and install fabric-backed roof membrane.
- F. In addition to adhering, mechanically fasten roof membrane securely at terminations, penetrations, and perimeter of roofing.
- G. Apply roof membrane with side laps shingled with slope of roof deck where possible.
- H. Seams: Clean seam areas, overlap roof membrane, and hot-air weld side and end laps of roof membrane and sheet flashings, to ensure a watertight seam installation.
  - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roof membrane and sheet flashings.
  - 2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
  - 3. Repair tears, voids, and lapped seams in roof membrane that do not comply with requirements.
- I. Spread sealant bed over deck-drain flange at roof drains, and securely seal roof membrane in place with clamping ring.

### **3.07 INSTALLATION OF BASE FLASHING**

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

### **3.08 INSTALLATION OF WALKWAYS**

- A. Flexible Walkways:
  - 1. Install flexible walkways at the following locations:
    - a. Perimeter of each rooftop unit.
    - b. Between each rooftop unit location, creating a continuous path connecting rooftop unit locations.
    - c. Between each roof hatch and each rooftop unit location or path connecting rooftop unit locations.

- d. Between each roof access ladder and each rooftop unit location or path connecting rooftop unit locations.
2. Provide 6-inch clearance between adjoining pads.
3. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

### **3.09 FIELD QUALITY CONTROL**

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and to inspect substrate conditions, surface preparation, roof membrane application, sheet flashings, protection, and drainage components, and to furnish reports to Architect.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion, in presence of Architect, and to prepare inspection report.
- C. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

### **3.10 PROTECTING AND CLEANING**

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing system, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

**END OF SECTION**

**SECTION 07 62 00**  
**SHEET METAL FLASHING AND TRIM**

**PART 1 - GENERAL**

**1.01 SUMMARY**

A. Section includes:

1. Roof-drainage sheet metal fabrications.
2. Low-slope roof sheet metal fabrications.
3. Wall sheet metal fabrications.
4. Miscellaneous sheet metal fabrications.

B. Related Sections include:

1. Division 06 Section "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.
2. Division 07 Section "Metal Composite Material Wall Panels" for sheet metal flashing and trim integral with metal wall panels.
3. Division 07 Section "Thermoplastic Polyolefin (TPO) Roofing" for materials and installation of sheet metal flashing and trim integral with roofing.
4. Division 07 Section "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, vents, and other manufactured roof accessory units.

**1.02 COORDINATION**

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

**1.03 PREINSTALLATION MEETINGS**

A. Preinstallation Conference: Conduct conference at Project site.

1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
3. Review requirements for insurance and certificates if applicable.
4. Review sheet metal flashing observation and repair procedures after flashing installation.

#### **1.04 ACTION SUBMITTALS**

- A. Product Data:
  - 1. Roof-drainage sheet metal fabrications.
  - 2. Low-slope roof sheet metal fabrications.
  - 3. Wall sheet metal fabrications.
  - 4. Miscellaneous sheet metal fabrications.
  
- B. Product Data Submittals:
  - 1. Elastomeric sealant.
  - 2. Butyl sealant.
  - 3. Epoxy seam sealer.
  
- C. Shop Drawings: For sheet metal flashing and trim.
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
  - 3. Include identification of material, thickness, weight, and finish for each item and location in Project.
  - 4. Include details for forming, including profiles, shapes, seams, and dimensions.
  - 5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
  - 6. Include details of termination points and assemblies.
  - 7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
  - 8. Include details of roof-penetration flashing.
  - 9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, flashings, and counterflashings.
  - 10. Include details of special conditions.
  - 11. Include details of connections to adjoining work.
  - 12. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches.
  
- D. Samples: For each exposed product and for each color and texture specified, 12 inches long by actual width.
  
- E. Samples for Verification: For each type of exposed finish.
  - 1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.

#### **1.05 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For fabricator.
  
- B. Sample Warranty: For special warranty.



**1.06 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.
- B. Special warranty.

**1.07 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
- B. Mockups: Provide sheet metal flashing and trim, and accessories required to construct integrated exterior mockup specified in Division 01 Section "Mockups."

**1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.
  - 1. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
  - 2. Protect stored sheet metal flashing and trim from contact with water.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

**1.09 WARRANTY**

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
    - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, are to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim are not to rattle, leak, or loosen, and are to remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual: Architectural Metal Flashing, Condensation and Air Leakage Control, and Reroofing" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent 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: 120 deg F, ambient; 180 deg F, material surfaces.

### **2.02 SHEET METALS**

- A. Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet in accordance with ASTM A653/A653M, G90 coating designation; prepainted by coil-coating process to comply with ASTM A755/A755M.
  - 1. Surface: Smooth, flat and mill phosphatized for field painting.
  - 2. Exposed Coil-Coated Finish:
    - a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
  - 3. Color: As selected by Architect from manufacturer's full range.
  - 4. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.
- C. Stainless Steel Sheet: ASTM A240/A240M, Type 304, dead soft, fully annealed; with smooth, flat surface.

1. Finish: ASTM A480/A480M, No. 2D (dull, cold rolled) or ASTM A480/A480M, No. 2B (bright, cold rolled).
  - a. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

### **2.03 MISCELLANEOUS MATERIALS**

- A. Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
  1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
    - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
    - b. Blind Fasteners: High-strength aluminum or stainless steel rivets suitable for metal being fastened.
  2. Fasteners for Zinc-Coated (Galvanized) or Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel in accordance with ASTM A153/A153M or ASTM F2329/F2329M.
  3. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
- C. Solder:
  1. For Stainless Steel: ASTM B32, Grade Sn60, with acid flux of type recommended by stainless steel sheet manufacturer.
  2. For Zinc-Coated (Galvanized) Steel: ASTM B32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
- E. Elastomeric Sealant: ASTM C920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

- G. Bituminous Coating: Cold-applied asphalt emulsion in accordance with ASTM D1187/D1187M.
- H. Asphalt Roofing Cement: ASTM D4586/D4586M, asbestos free, of consistency required for application.
- I. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions and with interlocking counterflashing on exterior face, of same metal as reglet.
  - 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. Cheney Flashing Company.
    - b. Fry Reglet Corporation.
    - c. Heckmann Building Products, Inc.
    - d. Hohmann & Barnard, Inc.
  - 2. Source Limitations: Obtain reglets from single source from single manufacturer.
  - 3. Material: Galvanized steel, 0.022 inch thick.
  - 4. 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.
  - 5. Accessories:
    - a. 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.
    - b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing's lower edge.
  - 6. Finish: Mill.

#### **2.04 FABRICATION, GENERAL**

- A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.
  - 1. 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.
  - 2. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.

3. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

**B. Fabrication Tolerances:**

1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.

**C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.**

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

**D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.**

**E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.**

**F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.**

**G. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.**

**H. Do not use graphite pencils to mark metal surfaces.**

**2.05 ROOF-DRAINAGE SHEET METAL FABRICATIONS**

**A. Downspouts: Fabricate rectangular downspouts to dimensions indicated on Drawings, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors. Shop fabricate elbows.**

1. Fabricate from galvanized steel, 0.028 inch thick.

**B. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape required, complete with outlet tubes, exterior flange trim, and built-in overflows. the following materials.:**

1. Fabricate from galvanized steel, 0.032 inch thick.

- C. Parapet Scuppers: Fabricate scuppers to dimensions required, with closure flange trim to exterior, 4-inch-wide wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof.

- 1. Fabricate from galvanized steel, 0.028 inch thick.

## **2.06 LOW-SLOPE ROOF SHEET METAL FABRICATIONS**

- A. Roof-Penetration Flashing: Fabricate from the following materials:

- 1. Galvanized Steel: 0.028 inch thick.

## **2.07 WALL SHEET METAL FABRICATIONS**

- A. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings. Form head and sill flashing with 2-inch-high, end dams.

- 1. Fabricate from stainless steel, 0.0156 inch thick.

## **2.08 MISCELLANEOUS SHEET METAL FABRICATIONS**

- A. Equipment Support Flashing: Fabricate from the following materials:

- 1. Galvanized Steel: 0.028 inch thick.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

- 1. Verify compliance with requirements for installation tolerances of substrates.
  - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
  - 3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 INSTALLATION, GENERAL

- A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.
1. Install fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
  2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
  3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
  4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
  5. Space individual cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
  6. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.
  7. Do not field cut sheet metal flashing and trim by torch.
  8. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Coat concealed side of sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.
1. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
  2. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
  3. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate substrate as follows:
1. Wood Blocking or Sheathing: Not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
  2. Metal Framing: Not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

- F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated.
    - a. Embed hooked flanges of joint members not less than 1 inch into sealant.
    - b. Form joints to completely conceal sealant.
    - c. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way.
    - d. Adjust setting proportionately for installation at higher ambient temperatures.
      - 1) Do not install sealant-type joints at temperatures below 40 deg F.
  2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter.
1. Pretin edges of sheets with solder to width of 1-1/2 inches; however, reduce pretinning where pretinned surface would show in completed Work.
  2. Do not solder metallic-coated steel sheet.
  3. Do not use torches for soldering.
  4. Heat surfaces to receive solder, and flow solder into joint.
    - a. Fill joint completely.
    - b. Completely remove flux and spatter from exposed surfaces.
  5. Stainless Steel Soldering:
    - a. Tin edges of uncoated sheets, using solder for stainless steel and acid flux.
    - b. Promptly remove acid-flux residue from metal after tinning and soldering.
    - c. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

### **3.03 INSTALLATION OF ROOF-DRAINAGE SYSTEM**

- A. Install sheet metal roof-drainage items to produce complete roof-drainage system in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Parapet Scuppers:
1. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.
  2. Loosely lock front edge of scupper with conductor head.
  3. Solder or seal with elastomeric sealant exterior wall scupper flanges into back of conductor head.
- C. Conductor Heads: Anchor securely to wall.



- D. Downspouts:
  - 1. Join sections with 1-1/2-inch telescoping joints.
  - 2. Provide hangers with fasteners designed to hold downspouts securely to walls.
  - 3. Locate hangers at top and bottom and at approximately 60 inches o.c.
  - 4. Connect downspouts to underground drainage system.
  
- E. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated on Drawings. Lap joints minimum of 4 inches in direction of water flow.

### **3.04 INSTALLATION OF ROOF FLASHINGS**

- A. Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard.
  - 1. Provide concealed fasteners where possible, and set units true to line, levels, and slopes.
  - 2. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
  
- B. Counterflashing: Coordinate installation of counterflashing with installation of base flashing.
  - 1. Insert counterflashing in receivers and fit tightly to base flashing.
  - 2. Extend counterflashing 4 inches over base flashing.
  - 3. Lap counterflashing joints minimum of 4 inches.
  - 4. Secure in waterproof manner by means of snap-in installation and sealant or lead wedges and sealant unless otherwise indicated.
  
- C. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

### **3.05 INSTALLATION OF WALL FLASHINGS**

- A. Install sheet metal wall flashing to intercept and exclude penetrating moisture in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
  
- B. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

### **3.06 INSTALLATION OF MISCELLANEOUS FLASHING**

- A. Equipment Support Flashing:

1. Coordinate installation of equipment support flashing with installation of roofing and equipment.
2. Weld or seal flashing with elastomeric sealant to equipment support member.

### **3.07 INSTALLATION TOLERANCES**

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

### **3.08 CLEANING**

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.

### **3.09 PROTECTION**

- A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended in writing by sheet metal flashing and trim manufacturer.
- C. Maintain sheet metal flashing and trim in clean condition during construction.
- D. 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, as determined by Architect.

**END OF SECTION**

**SECTION 07 65 00**  
**FLEXIBLE FLASHING**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes self-adhered butyl sheet flashing.
- B. Related Sections include:
  - 1. Division 07 Section "Fluid-Applied Membrane Air Barriers" for vapor retarding air barriers applied.
  - 2. Division 07 Section "Sheet Metal Flashing and Trim" for exposed sheet metal flashing.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Samples: For flashing sheet, 8 inches by 12 inches.

**1.03 QUALITY ASSURANCE**

- A. Source Limitations for Flashing: Obtain flexible flashing sheets through one source from a single manufacturer for each product required.

**PART 2 - PRODUCTS**

**2.01 PERFORMANCE**

- A. Provide flexible flashing products compatible with specified air barrier systems.
- B. Fire-Resistance Characteristics: For flexible flashing to be installed as a part of continuously-insulated exterior wall assembly, provide products that have been tested according NFPA 285 in similar wall assemblies. Identify products with appropriate markings of applicable testing agency.

**2.02 FLEXIBLE FLASHING**

- A. Butyl Flashing: Composite flashing product consisting of a polyethylene-film-reinforced top surface laminated to layer of butyl adhesive with release liner backing to produce an overall thickness of not less than 0.030 inch.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
  - a. DuPont Building Innovations: E. I. du Pont de Nemours and Company; DuPont Flashing Tape.
  - b. Grace Construction Products; W.R. Grace & Co. -- Conn.; Vycor Butyl Self Adhered Flashing.
  - c. Protecto Wrap Company; BT-25 XL.
  - d. Raven Industries, Inc; Fortress Flashshield.
  
- B. 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.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.02 INSTALLATION**

- A. General: Apply flexible flashing where indicated to comply with manufacturers written instructions.
- B. Install flexible flashing at ledges and other obstructions to downward flow of water in wall, and where indicated.
- C. Prepare concrete surfaces so they are smooth and free from projections that could puncture flashing. Before covering flashing sheet, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
- D. Prime substrates as recommended by flashing manufacturer.
- E. Lap seams and junctures with other materials at least 4 inches, except that at flashing flanges of other construction, laps need not exceed flange width.
- F. After flashing has been applied, roll surfaces with a hard rubber or metal roller to ensure that flashing is completely adhered to substrates.

### **END OF SECTION**

**SECTION 07 72 00**  
**ROOF ACCESSORIES**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Roof curbs.
  - 2. Roof hatches.

**1.02 COORDINATION**

- A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.
- B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of roof accessory.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For roof accessories.
  - 1. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.
- C. Samples: For each exposed product and for each color and texture specified, prepared on Samples of size to adequately show color.
- D. Delegated-Design Submittal: For roof curbs and equipment supports indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
  - 1. Detail mounting, securing, and flashing of roof-mounted items to roof structure. Indicate coordinating requirements with roof membrane system.

#### **1.04 INFORMATIONAL SUBMITTALS**

- A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:
  - 1. Size and location of roof accessories specified in this Section.
  - 2. Method of attaching roof accessories to roof or building structure.
  - 3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
  - 4. Required clearances.
- B. Sample Warranties: For manufacturer's special warranties.

#### **1.05 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

### **PART 2 - PRODUCTS**

#### **2.01 PERFORMANCE REQUIREMENTS**

- A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Delegated Design: Engage a qualified professional engineer, as defined in Division 01 Section "Quality Requirements," to design roof curbs and equipment supports to comply with wind performance requirements, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

#### **2.02 ROOF CURBS**

- A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings, bearing continuously on roof structure, and capable of meeting performance requirements; with welded or mechanically fastened and sealed corner joints, and integrally formed deck-mounting flange at perimeter bottom.
  - 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. Curbs Plus, Inc.
    - b. LMCurbs.

- c. Roof Curb Systems.
  - d. Thybar Corporation.
- B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.
- C. Supported Load Capacity: As scheduled on Mechanical Drawings.
- D. Material: Zinc-coated (galvanized) Aluminum-zinc alloy-coated steel sheet, not less than 0.064 inch thick.
  - 1. Finish: Baked enamel or powder coat.
  - 2. Color: As selected by Architect from manufacturer's standard range.
- E. Construction:
  - 1. Curb Profile: Manufacturer's standard compatible with roofing system.
  - 2. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
  - 3. Fabricate curbs to minimum height of 8 inches above roofing surface unless otherwise indicated.
  - 4. Top Surface: Level top of curb, with roof slope accommodated by sloping deck-mounting flange or by use of leveler frame.
  - 5. Insulation: Factory insulated with 1-1/2-inch-thick glass-fiber board insulation.
  - 6. Liner: Same material as curb, of manufacturer's standard thickness and finish.
  - 7. Nailer: Factory-installed wood nailer along top flange of curb, continuous around curb perimeter.
  - 8. Platform Cap: Where portion of roof curb is not covered by equipment, provide weathertight platform cap formed from 3/4-inch thick plywood covered with metal sheet of same type, thickness, and finish as required for curb.
  - 9. Metal Counterflashing: Manufacturer's standard, removable, fabricated of same metal and finish as curb.

## **2.03 ROOF HATCH**

- A. Roof Hatches: Metal roof-hatch units with lids and insulated double-walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, and integrally formed deck-mounting flange at perimeter bottom.
  - 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. Acudor Products, Inc.
    - b. Bilco Company (The).
    - c. Milcor; Commercial Products Group of Hart & Cooley, Inc.
    - d. Nystrom, Inc.
    - e. O'Keeffe's Inc.

- f. Precision Ladders, LLC.
- B. Type and Size: 30 inches by 36 inches, unless otherwise indicated on Drawings.
- C. Loads: Minimum 30-lbf/sq. ft. external live load and 30-lbf/sq. ft. internal uplift load.
- D. Hatch Material: Zinc-coated (galvanized) steel sheet.
  - 1. Thickness: Manufacturer's standard thickness for hatch size indicated but not less than 0.079 inch.
  - 2. Finish: Baked enamel or powder coat.
  - 3. Color: As selected by Architect from manufacturer's standard range.
- E. Construction:
  - 1. Insulation: Glass-fiber board.
    - a. R-Value: 6.0 according to ASTM C 1363.
  - 2. Nailer: Factory-installed wood nailer continuous around hatch perimeter.
  - 3. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
  - 4. Curb Liner: Manufacturer's standard, of same material and finish as metal curb.
  - 5. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
  - 6. Fabricate curbs to minimum height of 12 inches above roofing surface unless otherwise indicated.
- F. Hardware: Spring operators, hold-open arm, stainless-steel spring latch with turn handles, stainless-steel butt- or pintle-type hinge system, and padlock hasps inside and outside.
  - 1. Provide two-point latch on lids larger than 84 inches.
  - 2. Provide remote-control operation.
- G. Safety Railing System: Roof-hatch manufacturer's standard system including rails, clamps, fasteners, safety barrier at railing opening, and accessories required for a complete installation; attached to roof hatch and complying with 29 CFR 1910.23 requirements and authorities having jurisdiction.
  - 1. Height: 42 inches above finished roof deck.
  - 2. Posts and Rails: Galvanized-steel pipe, 1-1/4 inches in diameter or galvanized-steel tube, 1-5/8 inches in diameter.
  - 3. Maximum Opening Size: System constructed to prevent passage of a sphere 21 inches in diameter.
  - 4. Chain Passway Barrier: Galvanized proof coil chain with quick link on fixed end.
  - 5. Post and Rail Tops and Ends: Weather resistant, closed or plugged with prefabricated end fittings.



6. Provide weep holes or another means to drain entrapped water in hollow sections of handrail and railing members.
7. Fabricate joints exposed to weather to be watertight.
8. Fasteners: Manufacturer's standard, finished to match railing system.
9. Finish: Manufacturer's standard.

a. Color: As selected by Architect from manufacturer's standard range.

- H. Ladder-Assist Post: Roof-hatch manufacturer's standard device for attachment to roof-access ladder.

1. Operation: Post locks in place on full extension; release mechanism returns post to closed position.
2. Height: 42 inches above finished roof deck.
3. Material: Steel tube.
4. Post: 1-5/8-inch-diameter pipe.
5. Finish: Manufacturer's standard baked enamel or powder coat.

a. Color: As selected by Architect from manufacturer's standard range.

## **2.04 METAL MATERIALS**

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation.
1. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.
  2. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil.
- B. Steel Shapes: ASTM A 36/A 36M, hot-dip galvanized according to ASTM A 123/A 123M unless otherwise indicated.
- C. Steel Tube: ASTM A 500/A 500M, round tube.
- D. Galvanized-Steel Tube: ASTM A 500/A 500M, round tube, hot-dip galvanized according to ASTM A 123/A 123M.
- E. Steel Pipe: ASTM A 53/A 53M, galvanized.

## **2.05 MISCELLANEOUS MATERIALS**

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Glass-Fiber Board Insulation: ASTM C 726, nominal density of 3 lb/cu. ft., thermal resistivity of 4.3 deg F x h x sq. ft./Btu x in. at 75 deg F, thickness as indicated.

- C. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, and complying with AWPA C2; not less than 1-1/2 inches thick.
- D. Underlayment:
  - 1. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
  - 2. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:
  - 3. Fasteners for Zinc-Coated or Aluminum-Zinc Alloy-Coated Steel: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153/A 153M or ASTM F 2329.
- E. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.
- F. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.
- G. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.
- H. Asphalt Roofing Cement: ASTM D 4586/D 4586M, asbestos free, of consistency required for application.

## **2.06 GENERAL FINISH REQUIREMENTS**

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

- B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- C. Verify dimensions of roof openings for roof accessories.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. General: Install roof accessories according to manufacturer's written instructions.
  - 1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
  - 2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
  - 3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
  - 4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
  - 1. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of underlayment and cover with manufacturer's recommended slip sheet.
  - 2. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof accessories for waterproof performance.
- C. Roof Curb Installation: Install each roof curb so top surface is level.
- D. Equipment Support Installation: Install equipment supports so top surfaces are level with each other.
- E. Roof-Hatch Installation:
  - 1. Verify that roof hatch operates properly. Clean, lubricate, and adjust operating mechanism and hardware.
  - 2. Attach safety railing system to roof-hatch curb.
  - 3. Attach ladder-assist post according to manufacturer's written instructions.
- F. Seal joints with elastomeric sealant as required by roof accessory manufacturer.

**3.03 REPAIR AND CLEANING**

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780/A 780M.
- B. Clean exposed surfaces according to manufacturer's written instructions.
- C. Clean off excess sealants.
- D. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

**END OF SECTION**

**SECTION 07 92 00**  
**JOINT SEALANTS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Silicone joint sealants.
  - 2. Urethane joint sealants.
  - 3. Mildew-resistant joint sealants.
  - 4. Latex joint sealants.
- B. Related Sections include Division 07 Section "Acoustical Joint Sealants" for sealing joints in sound-rated construction.

**1.02 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each joint-sealant product.
- B. Samples for Initial 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. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information:
  - 1. Joint-sealant application, joint location, and designation.
  - 2. Joint-sealant manufacturer and product name.
  - 3. Joint-sealant formulation.
  - 4. Joint-sealant color.

**1.04 INFORMATIONAL SUBMITTALS**

- A. Field-Adhesion-Test Reports: For each sealant application tested.

- B. Sample Warranties: For special warranties.

#### **1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Mockups: Provide exterior joint sealants and accessories required to construct integrated exterior mockup specified in Division 01 Section "Mockups."

#### **1.06 FIELD 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 or are below 40 deg F.
  - 2. When joint substrates are wet.
  - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
  - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

#### **1.07 WARRANTY**

- A. Special Installer's Warranty: Installer agrees to repair or replace 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:
  - 1. Silicone Joint Sealants: Manufacturer agrees to furnish silicone joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
    - a. Warranty Period: Ten years from date of Substantial Completion.
  - 2. Urethane Joint Sealants: Manufacturer agrees to furnish urethane joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
    - a. Warranty Period: Five years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

## **PART 2 - PRODUCTS**

### **2.01 JOINT SEALANTS, 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 joint-sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

### **2.02 SILICONE JOINT SEALANTS**

- A. Silicone, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.
  1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
    - a. Dow Corning Corporation; 791.
    - b. GE Construction Sealants; Momentive Performance Materials Inc.; SCS2000 SilProf.
    - c. Pecora Corporation PCS.
    - d. Sika Corporation; Sikasil WS-295.

### **2.03 URETHANE JOINT SEALANTS**

- A. Urethane, S, P, 25, T, NT: Single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade P, Class 25, Uses T and NT.
  1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
    - a. BASF Corporation-Construction Systems; MasterSeal SL 1 (Pre-2014: Sonolastic SL1).
    - b. Pecora Corporation; NR-201.

## **2.04 MILDEW-RESISTANT JOINT SEALANTS**

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
    - a. Dow Corning Corporation; 786-M White.
    - b. GE Construction Sealants; Momentive Performance Materials Inc.; SCS1700 Sanitary.
    - c. Tremco Incorporated; Tremsil 200.

## **2.05 LATEX JOINT SEALANTS**

- A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
    - a. BASF Construction Chemicals - Construction Systems; Sonolac.
    - b. Pecora Corporation; AC-20.
    - c. Sherwin-Williams Company (The);950A Siliconized Acrylic Latex Caulk, White.
    - d. Tremco Incorporated; Tremflex 834.

## **2.06 JOINT-SEALANT BACKING**

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
  - 1. Provide any of the following types, as approved in writing by joint-sealant manufacturer for joint application indicated:
    - a. Type C (closed-cell material with a surface skin).
    - b. Type O (open-cell material).
    - c. Type B (bicellular material with a surface skin).



- C. Bond-Breaker Tape: Polyethylene 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. Provide self-adhesive tape where applicable.

## **2.07 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.

## **PART 3 - EXECUTION**

### **3.01 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 performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
  - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
    - a. Concrete.
    - b. Unglazed surfaces of ceramic tile.

3. Remove laitance and form-release agents from concrete.
  4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
    - a. Metal.
    - b. Glass.
    - c. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. 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.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### **3.03 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. Install sealant backings of kind 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.
  1. Do not leave gaps between ends of sealant backings.
  2. Do not stretch, twist, puncture, or tear sealant backings.
  3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
  1. Place sealants so they directly contact and fully wet joint substrates.
  2. Completely fill recesses in each joint configuration.
  3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
  2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
  3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.
  4. Provide flush joint profile at locations indicated on Drawings according to Figure 8B in ASTM C 1193.
  5. Provide recessed joint configuration of recess depth and at locations indicated on Drawings according to Figure 8C in ASTM C 1193.
    - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

### **3.04 FIELD QUALITY CONTROL**

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
1. Extent of Testing: Test completed and cured sealant joints as follows:
    - a. Perform 10 Insert number tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.
    - b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.
  2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
    - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
  3. Inspect tested joints and report on the following:
    - a. Whether sealants filled joint cavities and are free of voids.
    - b. Whether sealant dimensions and configurations comply with specified requirements.
    - c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.
  4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether

joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.

5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

- B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

### **3.05 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.

### **3.06 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, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

### **3.07 JOINT-SEALANT SCHEDULE**

- A. Exterior joints between non-porous materials in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:

- a. Joints between metal panels.
- b. Perimeter joints between materials listed above and frames of doors and windows.
- c. Other joints as indicated on Drawings.

2. Joint Sealant: Silicone, S, NS, 50, NT.

3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

- B. Interior joints in horizontal traffic surfaces.

1. Joint Locations:

- a. Isolation joints in cast-in-place concrete slabs.

- b. Other joints as indicated on Drawings.
  2. Joint Sealant: Urethane, S, P, 25, T, NT.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- C. Interior joints in vertical surfaces and horizontal nontraffic surfaces on inside face of exterior building envelope.
  1. Joint Locations:
    - a. Control and expansion joints on exposed interior surfaces of exterior walls.
    - b. Perimeter joints between interior wall surfaces and frames of exterior doors and windows and elevator entrances.
    - c. Other joints as indicated on Drawings.
  2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.
- D. Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.
  1. Joint Locations:
    - a. Control joints on exposed interior surfaces of exterior walls.
    - b. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.
    - c. Other joints as indicated on Drawings.
  2. Joint Sealant: Acrylic latex.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- E. Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.
  1. Joint Locations:
    - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
    - b. Tile control and expansion joints where indicated.
    - c. Other joints as indicated on Drawings.
  2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- F. Concealed mastics.
  1. Joint Locations:
    - a. Aluminum thresholds.
    - b. Sill plates.
    - c. Other joints as indicated on Drawings.

2. Joint Sealant: Silicone, S, NS, 50, NT.

**END OF SECTION**

**SECTION 07 92 19**  
**ACOUSTICAL JOINT SEALANTS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes acoustical joint sealants.
- B. Related Sections include Division 07 Section "Joint Sealants" for elastomeric, latex, and butyl-rubber-based joint sealants for nonacoustical applications.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each acoustical joint sealant.
- B. Samples for Initial Selection for Acoustical Joint Sealants Exposed to View: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each kind and color of acoustical joint sealant required, provide Samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Acoustical-Joint-Sealant Schedule: Include the following information:
  - 1. Joint-sealant application, joint location, and designation.
  - 2. Joint-sealant manufacturer and product name.
  - 3. Joint-sealant formulation.
  - 4. Joint-sealant color.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Sample Warranties: For special warranties.

**1.04 WARRANTY**

- A. Special Installer's Warranty: Installer agrees to repair or replace acoustical 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 agrees to furnish acoustical joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Three years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. Provide acoustical joint-sealant products that effectively reduce airborne sound transmission through perimeter joints and openings in building construction, as demonstrated by testing representative assemblies according to ASTM E 90.

### **2.02 ACOUSTICAL JOINT SEALANTS**

- A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex acoustical sealant complying with ASTM C 834.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Accumetric LLC.
    - b. Franklin International.
    - c. GE Construction Sealants; Momentive Performance Materials Inc.
    - d. Grabber Construction Products.
    - e. Hilti, Inc.
    - f. Pecora Corporation.
    - g. Tremco Incorporated.
    - h. United States Gypsum Company.
  - 2. Colors of Exposed Acoustical Joint Sealants: As selected by Architect from manufacturer's full range of colors.

### **2.03 MISCELLANEOUS MATERIALS**

- A. Primer: Material recommended by acoustical-joint-sealant manufacturer where required for adhesion of sealant to joint substrates.
- 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.



## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine joints indicated to receive acoustical joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Surface Cleaning of Joints: Clean out joints immediately before installing acoustical joint sealants to comply with joint-sealant manufacturer's written instructions.
- B. Joint Priming: Prime joint substrates where recommended by acoustical-joint-sealant manufacturer. 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.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### **3.03 INSTALLATION OF ACOUSTICAL JOINT SEALANTS**

- A. Comply with acoustical joint-sealant manufacturer's written installation instructions unless more stringent requirements apply.
- B. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical joint sealant. Install acoustical joint sealants at both faces of partitions, at perimeters, and through penetrations. Comply with ASTM C 919, ASTM C 1193, and manufacturer's written recommendations for closing off sound-flanking paths around or through assemblies, including sealing partitions to underside of floor slabs above acoustical ceilings.

### **3.04 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 acoustical joint sealants and of products in which joints occur.

**3.05 PROTECTION**

- A. Protect acoustical 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, remove, and repair damaged or deteriorated acoustical joint sealants immediately so installations with repaired areas are indistinguishable from original work.

**END OF SECTION**

**SECTION 08 11 13**  
**HOLLOW METAL DOORS AND FRAMES**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Exterior hollow-metal doors and frames.
  - 2. Interior hollow-metal doors and frames.
  - 3. Interior hollow-metal frames to receive flush wood doors,
- B. Related Sections include Division 08 Section "Flush Wood Doors" for solid-core wood doors installed in hollow metal frames.

**1.02 DEFINITIONS**

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

**1.03 COORDINATION**

- A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

**1.04 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.05 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.
- B. Shop Drawings: Include the following:
  - 1. Elevations of each door type.
  - 2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
  - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
  - 4. Locations of reinforcement and preparations for hardware.

5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings, removable stops, and glazing.
9. Details of conduit and preparations for power, signal, and control systems.

C. Samples for Verification:

1. For "Doors" and "Frames" subparagraphs below, prepare Samples approximately 12 by 12 inches to demonstrate compliance with requirements for quality of materials and construction:
  - a. Doors: Show vertical-edge, top, and bottom construction; core construction; and hinge and other applied hardware reinforcement. Include separate section showing glazing if applicable.
  - b. Frames: Show profile, corner joint, floor and wall anchors, and silencers. Include separate section showing fixed hollow-metal panels and glazing if applicable.

D. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

## **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
  1. Provide additional protection to prevent damage to factory-finished units.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch-high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  1. Ceco Door; ASSA ABLOY.
  2. Pioneer Industries.
  3. Republic Doors and Frames.

4. Steelcraft; an Allegion brand.

B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

## **2.02 INTERIOR DOOR AND FRAME ASSEMBLIES**

A. Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Heavy-Duty Doors and Frames: SDI A250.8, Level 2.

1. Physical Performance: Level B according to SDI A250.4.

2. Doors:

a. Type: As indicated in the Door and Frame Schedule.

b. Thickness: 1-3/4 inches.

c. Face: Uncoated, cold-rolled steel sheet, minimum thickness of 0.042 inch.

d. Edge Construction: Model 1, Full Flush.

e. Core: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core at manufacturer's discretion.

3. Frames:

a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch.

b. Sidelite Frames: Fabricated from same thickness material as adjacent door frame.

c. Construction: Full profile welded.

4. Exposed Finish: Prime.

## **2.03 INTERIOR FRAMES**

A. Construct interior frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Heavy-Duty Doors and Frames: SDI A250.8, Level 2.

1. Physical Performance: Level B according to SDI A250.4.

2. Frames:

a. Materials: Uncoated, steel sheet, minimum thickness of 0.053 inch.

b. Sidelite Frames: Fabricated from same thickness material as adjacent door frame.

c. Construction: Full profile welded.

3. Exposed Finish: Prime.

## 2.04 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

- A. Construct exterior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3.
  1. Physical Performance: Level A according to SDI A250.4.
  2. Doors:
    - a. Type: As indicated in the Door and Frame Schedule.
    - b. Thickness: 1-3/4 inches.
    - c. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A60 coating.
    - d. Edge Construction: Model 2, Seamless.
    - e. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration
    - f. Bottom Edges: Close bottom edges of doors where required for attachment of weather stripping with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape
    - g. Core: Polystyrene, polyurethane, polyisocyanurate.
      - 1) Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than 4.5 deg F x h x sq. ft./Btu when tested according to ASTM C 1363.
  3. Frames:
    - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A40 coating.
    - b. Transom Frames: Fabricated from same thickness material as adjacent door frame.
    - c. Construction: Full profile welded.
  4. Exposed Finish: Hot-dip galvanized to ASTM A 153.

## 2.05 FRAME ANCHORS

- A. Jamb Anchors:
  1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.

2. 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.
- B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch, and as follows:
  1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

## **2.06 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.
- D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.
  1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
- G. Grout: ASTM C 476, except with a maximum slump of 4 inches, 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 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 08 Section "Glazing."
- J. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

## 2.07 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. 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. Hollow-Metal Doors:
1. Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch, steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches apart. Spot weld to face sheets no more than 5 inches o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.
  2. Vertical Edges for Single-Acting Doors: Bevel edges 1/8 inch in 2 inches.
  3. Top Edge Closures: Close top edges of doors with inverted closures, except provide flush closures at exterior doors of same material as face sheets.
  4. Bottom Edge Closures: Close bottom edges of doors where required for attachment of weather stripping with end closures or channels of same material as face sheets.
  5. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
- C. Hollow-Metal Frames: 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.
1. Sidelite and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by welding.
  2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
  3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
  4. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
  5. 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 high.
      - 2) Four anchors per jamb from 60 to 90 inches high.
      - 3) Five anchors per jamb from 90 to 96 inches high.
      - 4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
    - b. 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.



6. Head Anchors: Two anchors per head for frames more than 42 inches wide and mounted in metal-stud partitions.
7. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. 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. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.
- E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
  1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
  2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
- F. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with mitered hairline joints.
  1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
  2. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
  3. Provide loose stops and moldings on inside of hollow-metal work.
  4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

## **2.08 STEEL FINISHES**

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
  1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

## **2.09 ACCESSORIES**

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inch thick.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

### **3.03 INSTALLATION**

- A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.
- B. Hollow-Metal Frames: Install hollow-metal frames for doors, transoms, sidelites, borrowed lites, and other openings, of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
  - 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. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    - b. Install frames with removable stops located on secure side of opening.
    - c. Install door silencers in frames before grouting.
    - d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    - e. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    - f. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
    - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
  3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
  4. In-Place Concrete: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
  5. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
    - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
    - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Steel Doors:
    - a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.
    - b. Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch.
    - c. At Bottom of Door: 5/8 inch plus or minus 1/32 inch.
    - d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.
- D. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow-metal 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.

### **3.04 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 hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow-metal work 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, rust-inhibitive primer.

- D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

**END OF SECTION**

**SECTION 08 14 16**  
**FLUSH WOOD DOORS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
1. Solid-core flush wood doors with plastic-laminate-faces.
  2. Factory fitting flush wood doors to frames and factory machining for hardware.

**1.02 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product, including the following:
1. Door core materials and construction.
  2. Door edge construction
  3. Door face type and characteristics.
  4. Door trim for openings.
  5. Door frame construction.
  6. Factory-machining criteria.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data; and the following:
1. Door schedule indicating door location, type, size, fire protection rating, and swing.
  2. Door elevations, dimension and locations of hardware, lite and louver cutouts, and glazing thicknesses.
  3. Details of frame for each frame type, including dimensions and profile.
  4. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
  5. Dimensions and locations of blocking for hardware attachment.
  6. Dimensions and locations of mortises and holes for hardware.
  7. Clearances and undercuts.
- C. Samples for Verification:
1. Plastic laminate, 6 inches square, for each color, texture, and pattern selected.

2. Corner sections of doors, approximately 8 by 10 inches, with door faces and edges representing actual materials to be used.
3. Frames for light openings, 6 inches long, for each material, type, and finish required.

**1.04 INFORMATIONAL SUBMITTALS**

- A. Sample Warranty: For special warranty.

**1.05 CLOSEOUT SUBMITTALS**

- A. Special warranties.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in plastic bags or cardboard cartons.
- C. Mark each door on bottom rail with opening number used on Shop Drawings.

**1.07 FIELD CONDITIONS**

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and HVAC system is operating and maintaining temperature and relative humidity at levels designed for building occupants for the remainder of construction period.

**1.08 WARRANTY**

- A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
  1. Failures include, but are not limited to, the following:
    - a. Delamination of plastic laminate faces.
    - b. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
  2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
  3. Warranty Period for Solid-Core Interior Doors: Life of installation.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Source Limitations: Obtain flush wood doors from single manufacturer.

### **2.02 FLUSH WOOD DOORS, GENERAL**

- A. Quality Standard: In addition to requirements specified, comply with AWI/AWMAC/WI's "Architectural Woodwork Standards."
  - 1. The Contract Documents may contain requirements that are more stringent than the referenced quality standard. Comply with the Contract Documents in addition to those of the referenced quality standard.

### **2.03 SOLID-CORE FLUSH WOOD DOORS WITH PLASTIC-LAMINATE FACES**

- A. Interior Doors:
  - 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. ASSA ABLOY.
    - b. Eggers Industries.
    - c. Haley Brothers, Inc.
    - d. Marshfield DoorSystems, Inc.
    - e. Oshkosh Door Company.
    - f. VT Industries Inc.
  - 2. Architectural Woodwork Standards Grade: Premium.
  - 3. Plastic-Laminate Faces: High-pressure decorative laminates complying with NEMA LD 3, Grade HGS.
  - 4. Colors, Patterns, and Finishes: As indicated or if not indicated as selected by Architect from laminate manufacturer's full range of products.
  - 5. Exposed Vertical Edges: Plastic laminate that matches faces, applied before faces.
  - 6. Core for Non-Fire-Rated Doors: Either glued wood stave or WDMA I.S. 10 structural composite lumber.
    - a. WDMA I.S. 10 structural composite lumber.
      - 1) Screw Withdrawal, Door Face: 550 lbf.
      - 2) Screw Withdrawal, Vertical Door Edge: 550 lbf.
  - 7. Construction: Five plies, hot-pressed or cold-pressed bonded (vertical and horizontal edging is bonded to core), with entire unit abrasive planed before faces and crossbands are applied.

## **2.04 FABRICATION**

- A. Factory fit doors to suit frame-opening sizes indicated.
  - 1. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
- B. Factory machine doors for hardware that is not surface applied.
  - 1. Locate hardware to comply with DHI-WDHS-3.
  - 2. Comply with final hardware schedules, door frame Shop Drawings, ANSI/BHMA-156.115-W, and hardware templates.
  - 3. Coordinate with hardware mortises in metal frames, to verify dimensions and alignment before factory machining.
  - 4. For doors scheduled to receive electrified locksets, provide factory-installed raceway and wiring to accommodate specified hardware.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
  - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
  - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. Hardware: For installation, see Division 08 Section "Door Hardware."
- B. Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
- C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

### **3.03 ADJUSTING**

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or that 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**

**SECTION 08 33 23**  
**OVERHEAD COILING DOORS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes insulated service doors.
- B. Related Sections include:
  - 1. Division 05 Section "Metal Fabrications" for miscellaneous steel supports, door-opening framing, corner guards, and bollards.
  - 2. Division 09 painting sections for finish painting of factory-primed doors.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type and size of overhead coiling door and accessory.
  - 1. Include construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
  - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
- B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.
  - 1. Include plans, elevations, sections, and mounting details.
  - 2. Include details of equipment assemblies, and indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
  - 3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
  - 4. For exterior components, include details of provisions for assembly expansion and contraction and for excluding and draining moisture to the exterior.
  - 5. Include diagrams for power, signal, and control wiring.
- C. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.
  - 1. Include similar Samples of accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish on the following components, in manufacturer's standard sizes:

1. Curtain slats.
2. Bottom bar with sensor edge.
3. Guides.
4. Brackets.
5. Hood.
6. Locking device(s).
7. Include similar Samples of accessories involving color selection.

### **1.03 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.
- B. Sample Warranty: For special warranty.

### **1.04 CLOSEOUT SUBMITTALS**

- A. Special warranty.
- B. Maintenance Data: For overhead coiling doors to include in maintenance manuals.

### **1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.
  1. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.
  2. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAl) certification.

### **1.06 WARRANTY**

- A. Special Warranty: Manufacturer agrees to repair or replace components of doors that fail in materials or workmanship within specified warranty period.
  1. Warranty Period: Two years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Source Limitations: Obtain overhead coiling doors from single source from single manufacturer.

1. Obtain operators and controls from overhead coiling-door manufacturer.

## **2.02 PERFORMANCE REQUIREMENTS**

- A. Accessibility Standard: Comply with applicable provisions in the TDLR "2012 Texas Accessibility Standards" (TAS).
- B. Structural Performance, Exterior Doors: Capable of withstanding the following design wind loads:
  1. Design Wind Load: Determine positive and negative wind pressures according to ASCE/SEI 7 using wind speed criteria indicated on Structural Drawings.
  2. Testing: According to ASTM E 330/E 330M.
  3. Deflection Limits: Design overhead coiling doors to withstand design wind load without evidencing permanent deformation or disengagement of door components.
  4. Operability under Wind Load: Design overhead coiling doors to remain operable under uniform pressure (velocity pressure) of wind load as indicated on Drawings, acting inward and outward.

## **2.03 DOOR ASSEMBLY**

- A. Insulated Service Door: Overhead coiling door formed with curtain of interlocking metal slats.
  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. Clopay Building Products.
    - b. Cookson; a CornellCookson company.
    - c. Cornell; a CornellCookson company.
    - d. Overhead Door Corporation.
    - e. Raynor.
    - f. Wayne-Dalton Corp.
- B. Operation Cycles: Door components and operators capable of operating for not less than 20,000. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.
- C. Air Infiltration: Maximum rate of 1.0 cfm/sq. ft. at 15 and 25 mph when tested according to ASTM E 283.
- D. Curtain R-Value: 4.5 deg F x h x sq. ft./Btu or as required to meet R-values indicated on Drawings.
- E. Door Curtain Material: Galvanized steel.
- F. Door Curtain Slats: Flat profile slats of 1-7/8-inch center-to-center height.

1. Insulated-Slat Interior Facing: Plastic.
- G. Bottom Bar: Two angles, each not less than 1-1/2 by 1-1/2 by 1/8 inch thick; fabricated from hot-dip galvanized steel and finished to match door.
- H. Curtain Jamb Guides: Galvanized steel with exposed finish matching curtain slats.
- I. Hood: Match curtain material and finish.
  1. Shape: Square.
  2. Mounting: As indicated on Drawings.
- J. Locking Devices: Equip door with slide bolt for padlock.
- K. Electric Door Operator:
  1. Usage Classification: Standard duty, up to 25 cycles per hour and up to 90 cycles per day
  2. Operator Location: As indicated on Drawings.
  3. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use; moving parts of operator enclosed or guarded if exposed and mounted at 8 feet or lower.
  4. Motor Exposure: Interior.
  5. Motor Electrical Characteristics:
    - a. Horsepower: 1/2 hp.
    - b. Voltage: 115-V ac or 230-V ac, single phase, 60 Hz.
  6. Emergency Manual Operation: Chain type.
  7. Obstruction-Detection Device: Automatic photoelectric sensor; self-monitoring type.
    - a. Sensor Edge Bulb Color: Black.
  8. Control Station(s): Where indicated on Drawings.
- L. Curtain Accessories: Equip door with weatherseals, astragal, and push/pull handles.
- M. Door Finish:
  1. Painted finish as selected by Architect from manufacturer's standard range of colors.

## **2.04 MATERIALS, GENERAL**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

## 2.05 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
1. Steel Door Curtain Slats: Zinc-coated (galvanized), cold-rolled structural-steel sheet; complying with ASTM A 653/A 653M, with G90 zinc coating; nominal sheet thickness (coated) of 0.028 inch; and as required.
  2. Insulation: Fill slats for insulated doors with manufacturer's standard thermal insulation complying with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84 or UL 723. Enclose insulation completely within slat faces.
  3. Plastic Interior Curtain-Slat Facing: Extruded PVC plastic with maximum flame-spread index of 25 and smoke-developed index of 450, according to ASTM E 84 or UL 723.
- B. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.

## 2.06 HOODS

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.
1. Galvanized Steel: Nominal 0.028-inch-thick, hot-dip galvanized-steel sheet with G90 zinc coating, complying with ASTM A 653/A 653M.

## 2.07 LOCKING DEVICES

- A. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.
1. Keys: Two for each cylinder.
- B. Safety Interlock Switch: Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.

## **2.08 CURTAIN ACCESSORIES**

1. At door head, use 1/8-inch-thick, replaceable, continuous-sheet baffle secured to inside of hood or field-installed on the header.
  2. At door jambs, use replaceable, adjustable, continuous, flexible, 1/8-inch-thick seals of flexible vinyl, rubber, or neoprene.
- B. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door.

## **2.09 COUNTERBALANCE MECHANISM**

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Counterbalance Barrel: Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, 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. Counterbalance Spring: 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. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.
- D. Torsion Rod for Counterbalance Shaft: Fabricate of manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.
- E. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

## **2.10 ELECTRIC DOOR OPERATORS**

- A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and operation-cycles requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, control stations, control devices, integral gearing for locking door, and accessories required for proper operation.
1. Comply with NFPA 70.
  2. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V ac or dc.
- B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.

- C. Door Operator Location(s): Operator location indicated for each door.
  - 1. Wall Mounted: Operator is mounted to the inside front wall on the left or right side of door and connected to door drive shaft with drive chain and sprockets. Side room is required for this type of mounting. Wall-mounted operator can also be mounted above or below shaft; if above shaft, headroom is required.
- D. Motors: Reversible-type motor with controller (disconnect switch) for motor exposure indicated for each door assembly.
  - 1. Electrical Characteristics: Minimum as indicated for each door assembly. If not indicated, large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. and not more than 12 in./sec., without exceeding nameplate ratings or service factor.
  - 2. Operating Controls, Controllers, Disconnect Switches, Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
  - 3. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.
- E. Limit Switches: Equip each motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.
- F. Obstruction-Detection Devices: External entrapment protection consisting of indicated automatic safety sensor capable of protecting full width of door opening. For non-fire-rated doors, activation of device immediately stops and reverses downward door travel.
  - 1. Photoelectric Sensor: Manufacturer's standard system designed to detect an obstruction in door opening without contact between door and obstruction.
    - a. Self-Monitoring Type: Designed to interface with door operator control circuit to detect damage to or disconnection of sensing device. When self-monitoring feature is activated, door closes only with sustained or constant pressure on close button.
- G. Control Station: Three-button control station in fixed location with momentary-contact push-button controls labeled "Open" and "Stop" and sustained- or constant-pressure push-button control labeled "Close."
  - 1. Interior-Mounted Units: Full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
- H. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 25 lbf.
- I. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of



limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.

- J. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.

## **2.11 GENERAL FINISH REQUIREMENTS**

- A. Comply with NAAMM/NOMMA 500 for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## **2.12 STEEL AND GALVANIZED-STEEL FINISHES**

- A. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.

# **PART 3 - EXECUTION**

## **3.01 EXAMINATION**

- A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Examine locations of electrical connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

## **3.02 INSTALLATION**

- A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Install overhead coiling doors, hoods, controls, and operators at the mounting locations indicated for each door.
- C. Accessibility: Install overhead coiling doors, switches, and controls along accessible routes in compliance with the accessibility standard.

- D. Power-Operated Doors: Install according to UL 325.

### **3.03 FIELD QUALITY CONTROL**

- A. Perform final inspection with the assistance of a factory-authorized service representative.
  - 1. Test door operation. Test manual operation of closed door.
- B. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
- C. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

### **3.04 STARTUP SERVICE**

- A. Engage a factory-authorized service representative to perform startup service.
  - 1. Complete installation and startup checks according to manufacturer's written instructions.
  - 2. After electrical circuitry has been energized, operate doors to confirm proper motor rotation and door performance.
  - 3. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

### **3.05 ADJUSTING**

- A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
  - 1. Adjust exterior doors and components to be weather resistant.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.
- C. Adjust seals to provide tight fit around entire perimeter.

### **3.06 REPAIR**

- A. Factory-Finish Touchup: Clean abraded areas and repair with same material used for factory finish in accordance with manufacturer's written instructions.

### **3.07 MAINTENANCE SERVICE**

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of coiling-door Installer.

Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

1. Perform maintenance, including emergency callback service, during normal working hours.

### **3.08 DEMONSTRATION**

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

**END OF SECTION**

**SECTION 08 41 13**  
**ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
1. Exterior storefront framing.
  2. Storefront framing for punched openings.
  3. Exterior manual-swing entrance doors.

**1.02 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For aluminum-framed entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.
1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
  2. Include full-size isometric details of each vertical-to-horizontal intersection of aluminum-framed entrances and storefronts, showing the following:
    - a. Joinery, including concealed welds.
    - b. Anchorage.
    - c. Expansion provisions.
    - d. Glazing.
    - e. Flashing and drainage.
  3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
- C. Samples for Initial Selection: For units with factory-applied color finishes.

- D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- E. Fabrication Sample: Of each vertical-to-horizontal intersection of assemblies, made from 12-inch lengths of full-size components and showing details of the following:
  - 1. Joinery, including concealed welds.
  - 2. Anchorage.
  - 3. Expansion provisions.
  - 4. Glazing.
  - 5. Flashing and drainage.
- F. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

#### **1.04 INFORMATIONAL SUBMITTALS**

- A. Test and Evaluation Reports:
  - 1. Product Test Reports: For aluminum-framed entrances and storefronts, for tests performed by **[qualified testing agency]** **[manufacturer and witnessed by a qualified testing agency]**.
- B. Field Quality-Control Submittals:
  - 1. Field quality-control reports.

#### **1.05 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For aluminum-framed entrances and storefronts to include in maintenance manuals.

#### **1.06 QUALITY ASSURANCE**

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

## **1.07 WARRANTY**

- A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship 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. Noise or vibration created by wind and thermal and structural movements.
    - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
    - d. Water penetration through fixed glazing and framing areas.
    - e. Failure of operating components.
  2. Warranty Period: Five years from date of Substantial Completion.
- B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.
  1. Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  2. Warranty Period: 20 years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
  1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
  2. Failure also includes the following:

- a. Thermal stresses transferring to building structure.
- b. Glass breakage.
- c. Noise or vibration created by wind and thermal and structural movements.
- d. Loosening or weakening of fasteners, attachments, and other components.
- e. Failure of operating units.

B. Structural Loads:

1. Wind Loads: Determine positive and negative wind pressures according to ASCE/SEI 7 using wind speed criteria indicated on Structural Drawings but not less than 30 psf.

C. Deflection of Framing Members: At design wind pressure, as follows:

1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.

D. Structural: Test according to ASTM E 330 as follows:

1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or 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.

E. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:

1. Fixed Framing and Glass Area:
  - a. Maximum air leakage of 0.06 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft.
2. Entrance Doors:
  - a. Pair of Doors: Maximum air leakage of 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.
  - b. Single Doors: Maximum air leakage of 0.5 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.

F. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 10 lbf/sq. ft.
- G. Energy Performance: Certify and label energy performance according to NFRC as follows:
1. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.45 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
  2. Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.25 as determined according to NFRC 200.

## **2.02 MANUFACTURERS**

- A. Basis of Design: Design is based on Kawneer North America; an Alcoa company, Trifab VersaGlaze 451T. Subject to compliance with requirements, provide named product or comparable product approved by Architect by one of the following:
1. Arcadia, Inc.
  2. EFCO Corporation.
  3. Oldcastle BuildingEnvelope.
  4. Trulite Glass & Aluminum Solutions, LLC.
  5. U.S. Aluminum; a brand of C.R. Laurence.
- B. Source Limitations: Obtain all components of aluminum-framed entrance and storefront system, including framing and accessories, from single manufacturer.

## **2.03 FRAMING**

- A. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
- B. Construction: Thermally broken.
- C. Glazing System: Retained mechanically with gaskets on four sides.
- D. Glazing Plane: Front set.
- E. Finish: High-performance organic finish.
- F. Fabrication Method: Field-fabricated stick system.
- G. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.
- H. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.



I. Materials:

1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
  - a. Sheet and Plate: ASTM B 209.
  - b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
  - c. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
  - d. Structural Profiles: ASTM B 308/B 308M.
  
2. Steel Reinforcement: Manufacturer's standard zinc-rich, 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.
  - a. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
  - b. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
  - c. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

## **2.04 ENTRANCE DOOR SYSTEMS**

- A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.
1. Basis of Design: Kawneer North America; an Alcoa company, 500 Standard Entrance.
  2. 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 deeply penetrated and fillet welded or that incorporate concealed tie rods.
  3. Door Design: Wide stile; 5-inch nominal width.
  4. Glazing Stops and Gaskets: Square, snap-on, extruded-aluminum stops and preformed gaskets.
    - a. Provide nonremovable glazing stops on outside of door.

## **2.05 ENTRANCE DOOR HARDWARE**

- A. General: Provide entrance door hardware and entrance door hardware sets indicated in door and frame schedule for each entrance door to comply with requirements in this Section.
1. Entrance Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products complying with BHMA standard referenced.
  2. Entrance Door Hardware: Hardware not specified in this Section is specified in Division 08 Section "Door Hardware."

- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of entrance door hardware are indicated in "Entrance Door Hardware Sets" Article. Products are identified by using entrance door hardware designations as follows:
  - 1. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.
- C. Continuous-Gear Hinges: BHMA A156.26.
  - 1. Basis of Design: Kawneer continuous gear hinge.
- D. Strikes: Provide strike with black-plastic dust box for each latch or lock bolt; fabricated for aluminum framing.
- E. Weather Stripping: Manufacturer's standard replaceable components.
  - 1. Compression Type: Made of ASTM D 2000, molded neoprene, or ASTM D 2287, molded PVC.
  - 2. Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.
- F. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.
- G. Silencers: BHMA A156.16, Grade 1.
- H. Thresholds: BHMA A156.21, raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch.

## **2.06 GLAZING**

- A. Glazing: Comply with Division 08 Section "Glazing."
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Glazing Sealants: As recommended by manufacturer.

## **2.07 ACCESSORIES**

- A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
  - 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
  - 2. Reinforce members as required to receive fastener threads.

3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.
- B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
  1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.
- C. Concealed Flashing: Dead-soft, 0.018-inch-thick stainless steel, ASTM A 240/A 240M of type recommended by manufacturer.
- D. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil thickness per coat.

## **2.08 FABRICATION**

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Fabricate components that, when assembled, have the following characteristics:
  1. Profiles that are sharp, straight, and free of defects or deformations.
  2. Accurately fitted joints with ends coped or mitered.
  3. Physical and thermal isolation of glazing from framing members.
  4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  5. Provisions for field replacement of glazing from interior.
  6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
  1. At exterior doors, provide compression weather stripping at fixed stops.
- F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
  1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
  2. At exterior doors, provide weather sweeps applied to door bottoms.

- G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.
- H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

## **2.09 ALUMINUM FINISHES**

- A. Superior-Performance Organic Finish, Two-Coat FEVE: Fluoropolymer finish complying with AAMA 2605.
  - 1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions for seacoast and severe environments.
  - 2. Color and Gloss: As selected by Architect from manufacturer's full range.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. General:
  - 1. Comply with manufacturer's written instructions.
  - 2. Do not install damaged components.
  - 3. Fit joints to produce hairline joints free of burrs and distortion.
  - 4. Rigidly secure nonmovement joints.
  - 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
  - 6. Seal perimeter and other joints watertight unless otherwise indicated.
- B. Metal Protection:
  - 1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
  - 2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

- C. Set continuous sill members and flashing in full sealant bed as specified in Division 07 Section "Joint Sealants" to produce weathertight installation.
- D. Install components plumb and true in alignment with established lines and grades.
- E. Install glazing as specified in Division 08 Section "Glazing."
- F. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.
  - 1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
  - 2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

### **3.03 ERECTION TOLERANCES**

- A. Erection Tolerances: Install aluminum-framed entrances and storefronts to comply with the following maximum tolerances:
  - 1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
  - 2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
  - 3. Alignment:
    - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
    - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
    - c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.
  - 4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

### **3.04 FIELD QUALITY CONTROL**

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Field Quality-Control Testing: Perform the following test on representative areas of aluminum storefront framing as selected by Architect.
  - 1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
    - a. Perform water-spray test on each installation of storefront framing. For storefront installation exceeding 20 feet in length, perform one test for each 10 feet of storefront.

2. Air Infiltration: ASTM E 783 at 1.5 times the rate specified for laboratory testing in "Performance Requirements" Article but not more than 0.09 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.
  3. Water Penetration: ASTM E 1105 at a minimum uniform and cyclic static-air-pressure differential of 0.67 times the static-air-pressure differential specified for laboratory testing in "Performance Requirements" Article, but not less than 10.0 lbf/sq. ft., and shall not evidence water penetration.
- C. Aluminum-framed entrances and storefronts will be considered defective if they do not pass tests and inspections.

**END OF SECTION**

**SECTION 08 71 00**  
**DOOR HARDWARE**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
1. Mechanical and electrified door hardware
  2. Electronic access control system components

**1.02 SUBMITTALS**

- A. General:
1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
  2. Prior to forwarding submittal:
    - a. Comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, "EXAMINATION" article, herein.
    - b. Review drawings and Sections from related trades to verify compatibility with specified hardware.
    - c. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
- B. Action Submittals:
1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
  2. Door Hardware Schedule:
    - a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
    - b. Submit with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
    - c. Indicate complete designations of each item required for each opening, include:
      - 1) Door Index: door number, heading number, and Architect's hardware set number.

- 2) Quantity, type, style, function, size, and finish of each hardware item.
- 3) Name and manufacturer of each item.
- 4) Fastenings and other pertinent information.
- 5) Location of each hardware set cross-referenced to indications on Drawings.
- 6) Explanation of all abbreviations, symbols, and codes contained in schedule.
- 7) Mounting locations for hardware.
- 8) Door and frame sizes and materials.
- 9) Degree of door swing and handing.
- 10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.

3. Key Schedule:

- a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
- b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
- c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
- d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
- e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
- f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

C. Informational Submittals:

1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
2. Provide Product Data:
  - a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
  - b. Include warranties for specified door hardware.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
  - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
  - b. Catalog pages for each product.



- c. Final approved hardware schedule edited to reflect conditions as installed.
- d. Final keying schedule
- e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
- f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

E. Inspection and Testing:

- 1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
  - a. Fire door assemblies, in compliance with NFPA 80.
  - b. Required egress door assemblies, in compliance with NFPA 101.

**1.03 QUALITY ASSURANCE**

A. Qualifications and Responsibilities:

- 1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
- 2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
- 3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
  - a. For door hardware: DHI certified AHC or DHC.
  - b. Can provide installation and technical data to Architect and other related subcontractors.
  - c. Can inspect and verify components are in working order upon completion of installation.
  - d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.
- 4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Certifications:

1. Fire-Rated Door Openings:
  - a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.
  - b. Provide only items of door hardware that are listed products tested by UL LLC, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.
2. Smoke and Draft Control Door Assemblies:
  - a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
  - b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. at tested pressure differential of 0.3-inch wg of water.
3. Electrified Door Hardware
  - a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
4. Accessibility Requirements: Comply with applicable provisions in the TDLR "2012 Texas Accessibility Standards" (TAS).

C. Pre-Installation Meetings

1. Keying Conference
  - a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
    - 1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
    - 2) Preliminary key system schematic diagram.
    - 3) Requirements for key control system.
    - 4) Requirements for access control.
    - 5) Address for delivery of keys.
2. Pre-installation Conference
  - a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - b. Inspect and discuss preparatory work performed by other trades.
  - c. Inspect and discuss electrical roughing-in for electrified door hardware.
  - d. Review sequence of operation for each type of electrified door hardware.

- e. Review required testing, inspecting, and certifying procedures.
  - f. Review questions or concerns related to proper installation and adjustment of door hardware.
3. Electrified Hardware Coordination Conference:
- a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

#### **1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.
- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.
- C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
- D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
- F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

#### **1.05 COORDINATION**

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

#### **1.06 WARRANTY**

- A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.

- 1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
- 2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.

- a. Mechanical Warranty

- 1) Locks

- a) Schlage ND Series: 10 years

- 2) Exit Devices

- a) Von Duprin: 3 years

- 3) Closers

- a) LCN 4000 Series: 30 years

- 4) Automatic Operators

- a) LCN: 2 year

- b. Electrical Warranty

- 1) Locks

- a) Schlage: 1 year

- 2) Exit Devices

- a) Von Duprin: 1 year

#### **1.07 MAINTENANCE**

- A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
- B. Turn over unused materials to Owner for maintenance purposes.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. The Owner requires use of certain products for their unique characteristics and project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."
  - 1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.
- B. Approval of alternate manufacturers and/or products other than those listed as "Scheduled Manufacturer" in the individual article for the product category are only to be considered by official substitution request in accordance with section 01 25 00.
- C. Approval of products is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.
- D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

### **2.02 MATERIALS**

- A. Fabrication
  - 1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer's recognized installation standards for application intended.
  - 2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
  - 3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with "Metal Doors and Frames", "Flush Wood Doors", "Stile and Rail Wood Doors" to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.
- B. Modification and Preparation of Existing Doors: Where existing door hardware is indicated to be removed and reinstalled.
  - 1. Provide necessary fillers, Dutchmen, reinforcements, and fasteners, compatible with existing materials, as required for mounting new opening hardware and to cover existing door and frame preparations.
  - 2. Use materials which match materials of adjacent modified areas.
  - 3. When modifying existing fire-rated openings, provide materials permitted by NFPA 80 as required to maintain fire-rating.

- C. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
  - 1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.
- D. Cable and Connectors:
  - 1. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with number and gage of wires enough to accommodate electric function of specified hardware.
  - 2. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.
  - 3. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

## **2.03 HINGES**

- A. Manufacturers and Products:
  - 1. Scheduled Manufacturer and Product:
    - a. Ives 5BB series
- B. Requirements:
  - 1. Provide hinges conforming to ANSI/BHMA A156.1.
  - 2. Provide five knuckle, ball bearing hinges.
  - 3. 1-3/4 inch thick doors, up to and including 36 inches wide:
    - a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches high
    - b. Interior: Standard weight, steel, 4-1/2 inches high
  - 4. 1-3/4 inch thick doors over 36 inches (wide):
    - a. Exterior: Heavy weight, bronze/stainless steel, 5 inches high
    - b. Interior: Heavy weight, steel, 5 inches high
  - 5. 2 inches or thicker doors:
    - a. Exterior: Heavy weight, bronze or stainless steel, 5 inches high
    - b. Interior: Heavy weight, steel, 5 inches high
  - 6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
  - 7. Provide three hinges per door leaf for doors 90 inches or less in height, and one additional hinge for each 30 inches of additional door height.

8. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.
9. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
  - a. Steel Hinges: Steel pins
  - b. Non-Ferrous Hinges: Stainless steel pins
  - c. Out-Swinging Exterior Doors: Non-removable pins
  - d. Out-Swinging Interior Lockable Doors: Non-removable pins
  - e. Interior Non-lockable Doors: Non-rising pins
10. Provide hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component. Provide mortar guard for each electrified hinge specified.

## **2.04 ELECTRIC POWER TRANSFER**

### A. Manufacturers:

1. Scheduled Manufacturer and Product:
  - a. Von Duprin EPT-10

### B. Requirements:

1. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
2. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.

## **2.05 CYLINDRICAL LOCKS – GRADE 1**

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Schlage ND series. No Substitute.

### B. Requirements:

1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3-hour fire doors.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide locks with standard 2-3/4 inches backset, unless noted otherwise, with 1/2-inch latch throw. Provide proper latch throw for UL listing at pairs.
4. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.

5. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
7. Provide electrified options as scheduled in the hardware sets.
8. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
  - a. Provide levers with vandal resistant technology as scheduled.
  - b. Lever Design: RHO.

## **2.06 EXIT DEVICES**

### **A. Manufacturers and Products:**

1. Scheduled Manufacturer and Product:
  - a. Von Duprin 99/33A series. No Substitute.

### **B. Requirements:**

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide grooved touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
6. Provide exit devices with weather resistant components that can withstand harsh conditions of various climates and corrosive cleaners used in outdoor pool environments.
7. Provide flush end caps for exit devices.
8. Provide exit devices with manufacturer's approved strikes.
9. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
10. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
11. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
12. Removable Mullions: 2 inch by 3 inch steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
13. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
14. Provide electrified options as scheduled.
15. Top latch mounting: double- or single-tab mount for steel doors, face mount for aluminum doors eliminating requirement of tabs, and double tab mount for wood doors.



16. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.

## **2.07 CYLINDERS**

### **A. Manufacturers and Products:**

1. Scheduled Manufacturer and Product:
  - a. Schlage Everest 29 T to match existing keying system. No Substitute.

### **B. Requirements:**

1. Provide cylinders/cores compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset; manufacturer's series as indicated. Refer to "KEYING" article, herein.
2. Provide cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.
  - a. Patented Restricted: cylinder with permanent core with patented, restricted keyway.
  - b. Patented Restricted: cylinder with interchangeable core with patented, restricted keyway.
3. Patent Protection: Cylinders/cores requiring use of restricted, patented keys, patent protected.
4. Nickel silver bottom pins.

## **2.08 KEYING**

### **A. Scheduled System:**

1. Existing factory registered system:
  - a. Provide cylinders/cores keyed into Owner's existing factory registered keying system. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

### **B. Requirements:**

1. Construction Keying:
  - a. Replaceable Construction Cores.
    - 1) Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
      - a) 3 construction control keys

- b) 12 construction change (day) keys.
  - 2) Owner or Owner's Representative will replace temporary construction cores with permanent cores.
2. Permanent Keying:
- a. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
    - 1) Master Keying system as directed by the Owner.
  - b. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.
  - c. Provide keys with the following features:
    - 1) Material: Nickel silver; minimum thickness of .107-inch.
    - 2) Patent Protection: Keys and blanks protected by one or more utility patent(s).
    - 3) Geographically Exclusive: Where High Security or Security cylinders/cores are indicated, provide nationwide, geographically exclusive key system complying with the following restrictions.
  - d. Identification:
    - 1) Mark permanent cylinders/cores and keys with applicable blind code for identification. Do not provide blind code marks with actual key cuts.
    - 2) Identification stamping provisions must be approved by the Architect and Owner.
    - 3) Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
    - 4) Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
    - 5) Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.
  - e. Quantity: Furnish in the following quantities.
    - 1) Permanent Control Keys: 3.
    - 2) Master Keys: 6.
    - 3) Change (Day) Keys: 3 per cylinder/core that is keyed differently.
    - 4) Key Blanks: Quantity as determined in the keying meeting.

## **2.09 KEY CONTROL SYSTEM**

### **A. Requirements:**

1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150 percent of number of locks required for Project.
  - a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
  - b. Provide hinged-panel type cabinet for wall mounting.

## **2.10 DOOR CLOSERS**

### **A. Manufacturers and Products:**

1. Scheduled Manufacturer and Product:
  - a. LCN 4040XP series. No Substitute.

### **B. Requirements:**

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2-inch diameter piston with 5/8-inch diameter double heat-treated pinion journal. QR code with a direct link to maintenance instructions.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 deg. F to -30 deg. F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards. Provide snap-on cover clip, with plastic covers, that secures cover to spring tube.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck. Provide graphically labelled instructions on the closer body adjacent to each adjustment valve. Provide positive stop on reg valve that prevents reg screw from being backed out.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

## 2.11 ELECTRO-MECHANICAL AUTOMATIC OPERATORS

### A. Manufacturers:

1. Scheduled manufacturer:
  - a. LCN Senior Swing. No Substitute.

### B. Requirements:

1. Provide low energy automatic operator units that are electro-mechanical design complying with ANSI/BHMA A156.19.
  - a. Opening: Powered by DC motor working through reduction gears.
  - b. Closing: Spring force.
  - c. Manual, hydraulic, or chain drive closers: Not permitted.
  - d. Operation: Motor is off when door is in closing mode. Door can be manually operated with power on or off without damage to operator. Provide variable adjustments, including opening and closing speed adjustment.
  - e. Cover: Aluminum.
2. Provide units with manual off/auto/hold-open switch, push and go function to activate power operator, vestibule interface delay, electric lock delay, hold-open delay adjustable from 1 to 32 seconds, and logic terminal to interface with accessories, mats, and sensors.
3. Provide drop plates, brackets, and adapters for arms as required to suit details.
4. Provide hard-wired motion sensors and/or actuator switches, and receivers for operation as specified. Provide weather-resistant actuators at exterior applications.
5. Provide key switches, with LED's, recommended and approved by manufacturer of automatic operator as required for function as described in operation description of hardware sets. Cylinders: Refer to "KEYING" article, herein.
6. Provide complete assemblies of controls, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of automatic operator for each individual leaf. Actuators control both doors simultaneously at pairs. Sequence operation of exterior and vestibule doors with automatic operators to allow ingress or egress through both sets of openings as directed by Architect. Locate actuators, key switches, and other controls as directed by Architect.

## 2.12 DOOR TRIM

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives

B. Requirements:

1. Provide push plates, push bars, pull plates, pulls, and hands-free reversible door pulls with diameter and length as scheduled.

**2.13 PROTECTION PLATES**

A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives

B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Size plates 2 inches less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

**2.14 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS**

A. Manufacturers:

1. Scheduled Manufacturers:
  - a. Glynn-Johnson

B. Requirements:

1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.

**2.15 DOOR STOPS AND HOLDERS**

A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide concave type where lockset has a push button of thumbturn.

2. Where a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

## **2.16 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING**

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Zero International

### B. Requirements:

1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.
2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
4. Size thresholds 1/2 inch high by 5 inches wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

## **2.17 SILENCERS**

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives

### B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

## **2.18 FINISHES**

- A. FINISH: As Scheduled.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
  - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
  - 2. Custom Steel Doors and Frames: HMMA 831.
  - 3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
  - 4. Installation Guide for Doors and Hardware: DHI TDH-007-20
- B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.
- C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.

- I. Lock Cylinders:
  - 1. Install construction cores to secure building and areas during construction period.
  - 2. Replace construction cores with permanent cores as indicated in keying section.
  - 3. Furnish permanent cores to Owner for installation.
  
- J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:
  - 1. Conduit, junction boxes and wire pulls.
  - 2. Connections to and from power supplies to electrified hardware.
  - 3. Connections to fire/smoke alarm system and smoke evacuation system.
  - 4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
  - 5. Connections to panel interface modules, controllers, and gateways.
  - 6. Testing and labeling wires with Architect's opening number.
  
- K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
  
- L. Door Closers and Auto Operators: Mount closers/operators on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers/operators so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.
  
- M. Overhead Stops/holders: Mount overhead stops/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
  
- N. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.
  
- O. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
  
- P. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
  
- Q. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
  
- R. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
  
- S. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.



### **3.03 ADJUSTING**

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
  - 1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

### **3.04 CLEANING AND PROTECTION**

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items per manufacturer's instructions to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

### **3.05 DOOR HARDWARE SCHEDULE**

- A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.
- B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.
- C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.
- D. Hardware Sets: Refer to Drawings.

### **END OF SECTION**

**SECTION 08 80 00**  
**GLAZING**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Glazing for:
    - a. Storefront framing.
    - b. Doors.
  - 2. Glazing includes:
    - a. Monolithic uncoated glass.
    - b. Insulated glazing units with low-e and ceramic frit coatings.
  - 3. Glazing sealants and accessories.

**1.02 DEFINITIONS**

- A. Glass Manufacturers: 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.

**1.03 COORDINATION**

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

**1.04 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 2. Review temporary protection requirements for glazing during and after installation.

**1.05 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Glass Samples: For insulating glass ducts; 12 inches square.
- C. Glazing Accessory Samples: For sealants, in 12-inch lengths. Install sealant Samples between two strips of material representative in color of the adjoining framing system.
- D. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- E. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

**1.06 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For fabricators of insulating-glass units with sputter-coated, low-E coatings.
- B. Sample Warranties: For special warranties.

**1.07 QUALITY ASSURANCE**

- A. Fabricator Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved and certified by coated-glass manufacturer.
- B. Mockups: Provide glazing and glazing accessories required to construct integrated exterior mockup specified in Division 01 Section "Mockups."

**1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

**1.09 FIELD 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. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F.

## **1.10 WARRANTY**

- A. **Manufacturer's Special Warranty for Coated-Glass Products:** Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: 10 years from date of Substantial Completion.

- B. **Manufacturer's Special Warranty for Insulated Glazing Units:** Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: 10 years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. **Source Limitations for Glass:** Obtain from single source from single manufacturer for each glass type.

1. Obtain tinted glass from single source from single manufacturer.

- B. **Source Limitations for Glazing Accessories:** Obtain from single source from single manufacturer for each product and installation method.

### **2.02 PERFORMANCE REQUIREMENTS**

- A. **General:** Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

- B. Delegated Design: Engage a qualified professional engineer, as defined in Division 01 Section "Quality Requirements," to design glazing.
- C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the IBC and ASTM E 1300.
  - 1. Design Wind Pressures: Determine design wind pressures applicable to Project according to ASCE/SEI 7, based on heights above grade indicated on Drawings, using wind speed criteria indicated on Structural Drawings.
  - 2. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch, whichever is less.
  - 3. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
- D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- E. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
  - 1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
  - 2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
  - 3. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F.
  - 4. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
  - 5. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

### **2.03 GLASS PRODUCTS, GENERAL**

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  - 1. GANA Publications: "Glazing Manual."
  - 2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

- C. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.
  - 1. Minimum Glass Thickness for Exterior Lites: 6 mm.
  - 2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.
  
- D. Strength:
  - 1. Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article.
  - 2. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article.
  - 3. Where fully tempered float glass is indicated, provide fully tempered float glass.

## **2.04 GLASS PRODUCTS**

- A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.
  
- B. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
  
- C. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
  - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
  
- D. Ceramic-Coated (Translucent Frit) Glass: ASTM C1048, Type I, Condition B, Quality-Q3.
  
- E. Low-E Coating: ASTM C1376:
  - 1. Sputter-Coatings: Metallic-oxide or -nitride coating deposited by vacuum deposition process after manufacture.
  
- F. Insulated Glazing Units: ASTM E 774.

## **2.05 INSULATING GLASS**

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
  2. Spacer: Aluminum with black, color anodic finish.
  3. Desiccant: Molecular sieve or silica gel, or a blend of both.

## **2.06 GLAZING SEALANTS**

- A. General:
1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
  2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
  3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 50, Use NT.

## **2.07 GLAZING TAPES**

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
  2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
  2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

## **2.08 MISCELLANEOUS GLAZING MATERIALS**

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, with 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 of 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).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

## **2.09 FABRICATION OF GLAZING UNITS**

- A. Fabricate glazing units in sizes required to fit 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.
  - 1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
    - a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine framing, glazing channels, and stops, 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 systems.
  - 3. Minimum required face and edge clearances.



- 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

### **3.03 GLAZING, GENERAL**

- A. Comply with combined written instructions of manufacturers of glass, sealants, 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 includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. 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.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches.
  - 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.
- G. 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.

- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

### **3.04 TAPE GLAZING**

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant where indicated.
- G. Center glass lites in openings on setting blocks, and press firmly against tape 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.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

### **3.05 GASKET GLAZING (DRY)**

- A. Cut compression gaskets to 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. Installation with Drive-in Wedge Gaskets: 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. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

### **3.06 CLEANING AND PROTECTION**

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
  - 1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

### **3.07 MONOLITHIC GLASS SCHEDULE**

- A. Glass Type 1: Clear annealed glass.
  - 1. Minimum Thickness: 6 mm.
- B. Glass Type 2: Clear fully tempered float glass.
  - 1. Minimum Thickness: 6 mm.
  - 2. Safety glazing required.

C. Glass Type 3: Tinted fully tempered float glass.

1. Minimum Thickness: 6 mm.
2. Safety glazing required.

**3.08 INSULATING GLASS SCHEDULE**

A. Glass Type 1: Low-E-coated, clear insulating glass where safety glazing is indicated or required.

1. Basis-of-Design Product: Vitro Solarban 70 on Solargray.
2. Overall Unit Thickness: 1 inch.
3. Minimum Thickness of Each Glass Lite: 6 mm.
4. Outdoor Lite: Tinted fully tempered float glass.
5. Interspace Content: Air.
6. Indoor Lite: Clear fully tempered float glass.
7. Low-E Coating: Sputtered on second surface.
8. Transmittance:
  - a. Visible Light Transmittance: 41 percent minimum.
  - b. UV Transmittance: 2 percent maximum.
9. Thermal Performance:
  - a. Winter Nighttime U-Factor: 0.29 maximum.
  - b. Solar Heat Gain Coefficient: 0.23 maximum.
10. Safety glazing required.

B. Glass Type 2: Low-E-coated, clear insulating glass where safety glazing is not required.

1. Basis-of-Design Product: Vitro Solarban 70 on Solargray.
2. Overall Unit Thickness: 1 inch.
3. Minimum Thickness of Each Glass Lite: 6 mm.
4. Outdoor Lite: Tinted heat strengthened float glass.
5. Interspace Content: Air.
6. Indoor Lite: Clear annealed float glass.
7. Low-E Coating: Sputtered on second surface.
8. Transmittance:
  - a. Visible Light Transmittance: 41 percent minimum.
  - b. UV Transmittance: 2 percent maximum.
9. Thermal Performance:
  - a. Winter Nighttime U-Factor: 0.29 maximum.
  - b. Solar Heat Gain Coefficient: 0.23 maximum.

- C. Glass Type 3: Ceramic-coated, Low-E, clear insulating spandrel glass where safety glazing is not required.
1. Basis-of-Design Product: Vitro Solargray with Solarban 70(2) and Viracon V1093(3) translucent frit.
  2. Overall Unit Thickness: 1 inch.
  3. Minimum Thickness of Each Glass Lite: 6 mm.
  4. Outdoor Lite: Tinted heat strengthened float glass.
  5. Interspace Content: Air.
  6. Indoor Lite: Clear annealed float glass.
  7. Low-E Coating: Sputtered on second surface.
  8. Translucent Frit Coating Location: Third surface.
  9. Thermal Performance:
    - a. Winter Nighttime U-Factor: 0.29 maximum.
    - b. Solar Heat Gain Coefficient: 0.23 maximum.

**END OF SECTION**

**SECTION 08 91 19**  
**FIXED LOUVERS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes fixed, extruded-aluminum louvers.

**1.02 DEFINITIONS**

- A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.
- B. Wind-Driven-Rain-Resistant Louver: Louver that provides specified wind-driven rain performance, as determined by testing according to AMCA 500-L.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.
- B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.
  - 1. Show weep paths, gaskets, flashing, sealant, and other means of preventing water intrusion.
- C. Samples: For each type of metal finish required.
- D. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

**1.04 WARRANTY**

- A. Special Finish Warranty: Manufacturer agrees to repair or replace components on which finishes fail in materials or workmanship within specified warranty period.
  - 1. Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.

- b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
  - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Warranty Period: 20 years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Source Limitations: Obtain louvers from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.

### **2.02 PERFORMANCE REQUIREMENTS**

- A. Structural Performance: Louvers shall withstand 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 normal to the face of the building.
- B. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
- 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

### **2.03 FIXED, EXTRUDED-ALUMINUM LOUVERS**

- A. Horizontal, Wind-Driven-Rain-Resistant Louver:
- 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. Airolite Company, LLC (The).
    - b. Construction Specialties, Inc.
    - c. Greenheck Fan Corporation.
    - d. Industrial Louvers Inc.
    - e. NCA Manufacturing, Inc.
    - f. Nystrom, Inc.
    - g. Ruskin Company.
  - 2. Minimum Louver Depth: 4 inches.
  - 3. Frame and Blade Nominal Thickness: Not less than 0.080 inch.

4. Louver Performance Ratings:
  - a. Free Area: Not less than 8.0 sq. ft. for 48-inch-wide by 48-inch-high louver.
  - b. Air Performance: Not more than 0.10-inch wg static pressure drop at 600-fpm free-area intake velocity.
  - c. Wind-Driven Rain Performance: Not less than 95 percent effectiveness when subjected to a rainfall rate of 8 inches per hour and a wind speed of 50 mph at a core-area intake velocity of 400 fpm.

## **2.04 LOUVER SCREENS**

- A. General: Provide screen at each exterior louver.
  1. Screen Location for Fixed Louvers: Interior face.
  2. Screening Type: Bird screening.
- B. Secure screen frames 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 type and form of metal as indicated for louver to which screens are attached. Reinforce extruded-aluminum screen frames at corners with clips.
  2. Finish: Mill finish unless otherwise indicated.
  3. Type: Non-rewirable, U-shaped frames.
- D. Louver Screening for Aluminum Louvers:
  1. Bird Screening: Aluminum, 1/2-inch-square mesh, 0.063-inch wire.

## **2.05 MATERIALS**

- A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5, T-52, or T6.
- B. Aluminum Sheet: ASTM B 209, Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.
- C. Fasteners: Use types and sizes to suit unit installation conditions.
  1. Use hex-head or Phillips pan-head screws for exposed fasteners unless otherwise indicated.
  2. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.
  3. For color-finished louvers, use fasteners with heads that match color of louvers.
- D. 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 according to ASTM E 488, conducted by a qualified independent testing agency.

- E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

## **2.06 FABRICATION**

- A. Factory assemble louvers to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.
- C. 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.
  - 1. Frame Type: Channel unless otherwise indicated.
- D. Include supports, anchorages, and accessories required for complete assembly.
- E. Provide subsills made of same material as louvers for recessed louvers.
- F. Join frame members to each other and to fixed louver blades with fillet welds, threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

## **2.07 ALUMINUM FINISHES**

- A. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
  - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

### **3.03 INSTALLATION**

- A. Locate and place louvers 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. Form closely fitted joints with exposed connections accurately located and secured.
- D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- E. Protect nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.
- F. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Division 07 Section "Joint Sealants" for sealants applied during louver installation.

### **3.04 ADJUSTING AND CLEANING**

- A. Clean exposed louver surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.
- 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 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.
- D. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

**END OF SECTION**

**SECTION 09 22 16**  
**NON-STRUCTURAL METAL FRAMING**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
1. Non-load-bearing steel framing systems for interior gypsum board assemblies.
  2. Suspension systems for interior gypsum ceilings, soffits, and grid systems.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
1. Include data indicating compliance with performance standards. Clearly indicate on Product Data size and thickness of framing required for each condition.

**PART 2 - PRODUCTS**

**2.01 PERFORMANCE REQUIREMENTS**

- A. Steel Framing: Metal thicknesses indicated are minimum thickness selected to meet structural design criteria for non-structural, interior partitions. Where metal framing manufacturer's published Product Data recommends a greater thickness for the condition indicated, provide metal framing in recommended thickness.
1. Lateral Load: 5 lbs/sq. ft.
  2. Maximum Allowable Deflection:
    - a. Typical Partitions: L/240.
    - b. Partitions With tile Finishes: L/480.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

**2.02 FRAMING SYSTEMS**

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
  2. Protective Coating: ASTM A 653/A 653M, G60, hot-dip galvanized unless otherwise indicated.
- B. Studs and Runners: ASTM C 645.
1. Steel Studs and Runners:
    - a. Minimum Base-Metal Thickness: 20 gage.
    - b. Depth: As indicated on Drawings.
- C. Slip-Type Head Joints: Where indicated, provide one of the following:
1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch-deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.
  2. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch-deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
  3. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
1. Minimum Base-Metal Thickness: 20 gage.
- E. Cold-Rolled Channel Bridging: Steel, 0.053-inch minimum base-metal thickness, with minimum 1/2-inch-wide flanges.
1. Depth: 1-1/2 inches.
  2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch-thick, galvanized steel.
- F. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
1. Minimum Base-Metal Thickness: 0.018 inch.
  2. Depth: As indicated on Drawings.
- G. Resilient Furring Channels: 1/2-inch-deep, steel sheet members designed to reduce sound transmission.
1. Configuration: Asymmetrical or hat shaped.
- H. Cold-Rolled Furring Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges.

1. Depth: 3/4 inch.
2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum uncoated-steel thickness of 0.033 inch.
3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch-diameter wire.

### **2.03 SUSPENSION SYSTEMS**

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch-diameter wire.
- B. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.
- C. Flat Hangers: Steel sheet, in size indicated on Drawings.
- D. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.053 inch and minimum 1/2-inch-wide flanges.
  1. Depth: 2-1/2 inches.
- E. Furring Channels (Furring Members):
  1. Cold-Rolled Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges, 3/4 inch deep.
  2. Steel Studs and Runners: ASTM C 645.
    - a. Minimum Base-Metal Thickness: 0.018 inch.
    - b. Depth: 2-1/2 inches.
  3. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep.
    - a. Minimum Base-Metal Thickness: 0.018 inch.
  4. Resilient Furring Channels: 1/2-inch-deep members designed to reduce sound transmission.
    - a. Configuration: Asymmetrical or hat shaped.
- F. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
  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. Armstrong World Industries, Inc.
    - b. Chicago Metallic Corporation.

## **2.04 AUXILIARY MATERIALS**

- A. General: Provide auxiliary materials that comply with referenced installation standards.
  - 1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

## **PART 3 - EXECUTION**

### **3.01 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 of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

### **3.03 INSTALLATION, GENERAL**

- A. Installation Standard: ASTM C 754.
  - 1. Portland Cement Plaster Assemblies: Also comply with requirements in ASTM C 1063 that apply to framing installation.
  - 2. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Install bracing at terminations in assemblies.
- D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

### **3.04 INSTALLING FRAMED ASSEMBLIES**

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

1. Single-Layer Application: 16 inches o.c. unless otherwise indicated.
  2. Tile Backing Panels: 16 inches o.c. unless otherwise indicated.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
  2. Door Openings: 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.
    - a. Install two 0.0359 inch thick metal studs at each jamb unless otherwise indicated.
    - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
    - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
  3. Other Framed Openings: 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.
  4. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
- E. Direct Furring: Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
- F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

### **3.05 INSTALLING SUSPENSION SYSTEMS**

- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
1. Hangers: 48 inches o.c.
  2. Carrying Channels (Main Runners): 48 inches o.c.
  3. Furring Channels (Furring Members): 16 inches o.c.

- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend 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 suspension system.
    - a. 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 locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
    - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
  - 3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
  - 4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, 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. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- E. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

**END OF SECTION**



**SECTION 09 29 00**  
**GYPSUM BOARD**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Interior gypsum board.
  - 2. Tile backing panels.
- B. Related Sections include Division 09 Section "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board panels.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Samples: For the following products:
  - 1. Gypsum Board: Panels, 12 inches square, for each type indicated.
  - 2. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.

**1.03 DELIVERY, STORAGE AND HANDLING**

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

**1.04 FIELD CONDITIONS**

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

## **PART 2 - PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

### **2.02 GYPSUM BOARD, GENERAL**

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

### **2.03 INTERIOR GYPSUM BOARD**

- A. Gypsum Board, Type X: ASTM C1396/C1396M.
  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. American Gypsum.
    - b. CertainTeed Corporation.
    - c. Georgia-Pacific Building Products.
    - d. National Gypsum Company.
    - e. United States Gypsum Company.
  2. Thickness: 5/8 inch.
  3. Long Edges: Tapered and featured (rounded or beveled) for prefilling.

### **2.04 TILE BACKING PANELS**

- A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.
  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. CertainTeed Corporation.
    - b. Georgia-Pacific Building Products.

- c. National Gypsum Company.
2. Core: 5/8-inch, Type X.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

## **2.05 TRIM ACCESSORIES**

- A. Interior Trim: ASTM C 1047.
  1. Material: Galvanized coated steel sheet or vinyl.
  2. Shapes:
    - a. Cornerbead.
    - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
    - c. L-Bead: L-shaped; exposed long flange receives joint compound.
    - d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
    - e. Expansion (control) joint.
- B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.
  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. Fry Reglet Corporation.
    - b. Gordon Incorporated.
    - c. Pittcon Industries.
  2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B221, Alloy 6063-T5.
  3. Finish: Clear anodized.

## **2.06 JOINT TREATMENT MATERIALS**

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
  1. Interior Gypsum Board: Paper.
  2. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
  1. Prefilling: At open joints, rounded or beveled panel edges, 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.

D. Joint Compound for Tile Backing Panels:

1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.

## **2.07 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. Sound-Attenuation Blankets: ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
- E. Acoustical Joint Sealant: As specified in Division 07 Section "Acoustical Joint Sealant."
- F. Thermal Insulation: As specified in Division 07 Section "Thermal Insulation."

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install 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. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support 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 structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8 inch-wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2 inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. STC-Rated Assemblies: Seal construction at perimeters, behind control 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 with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
- J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

### **3.03 APPLYING INTERIOR GYPSUM BOARD**

- A. Install interior gypsum board as indicated on Drawings.
- B. Single-Layer Application:
  - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
  - 2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated, and minimize end joints.
    - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
    - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated.
  - 3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

### **3.04 APPLYING TILE BACKING PANELS**

- A. Glass-Mat, Water-Resistant Backing Panels: Comply with manufacturer's written installation instructions and install at locations indicated to receive tile except where cementitious backer units are indicated. Install with 1/4-inch gap where panels abut other construction or penetrations.
- B. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

### **3.05 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 at locations indicated on Drawings or if not indicated according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
  - 1. Cornerbead: Use at outside corners.
  - 2. LC-Bead: Use at exposed panel edges.
  - 3. L-Bead: Use where indicated.
  - 4. U-Bead: Use at exposed panel edges where indicated.
- D. Aluminum Trim: Install in locations indicated on Drawings.

### **3.06 FINISHING GYPSUM BOARD**

- 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, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
  - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
  - 2. Level 2: Panels that are substrate for tile.
  - 3. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
    - a. Primer and its application to surfaces are specified in Division 09 Section "Interior Painting."
  - 4. Level 5: Where indicated.
    - a. Primer and its application to surfaces are specified in Division 09 Section "Interior Painting."
- E. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

### **3.07 PROTECTION**

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

### **END OF SECTION**

**SECTION 09 30 13**  
**CERAMIC TILING**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes ceramic tile.
- B. Related Sections include:
  - 1. Division 07 Section "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
  - 2. Division 09 Section "Gypsum Board" for glass-mat, water-resistant backer board.

**1.02 DEFINITIONS**

- A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in its "Specifications for Installation of Ceramic Tile."
- C. Ceramic Tile: Includes porcelain tile, pressed floor tile, ceramic mosaic tile, quarry tile, and glazed wall tile.

**1.03 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

**1.04 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C. Samples for Initial Selection: For tile, grout, and accessories involving color selection.



D. Samples for Verification:

1. Full-size units of each type and composition of tile and for each color and finish required. For ceramic mosaic tile in color blend patterns, provide full sheets of each color blend.
2. Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each color and finish required. Make samples at least 18 inches square, but not fewer than four tiles. Use grout of type and in color or colors approved for completed Work.
3. Full-size units of each type of trim and accessory for each color and finish required.
4. Stone thresholds in 6-inch lengths.

**1.05 INFORMATIONAL SUBMITTALS**

- A. Product Certificates: For each type of product.

**1.06 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Tile and Trim Units: Furnish one box of full-size units for each type, composition, color, pattern, and size indicated.

**1.07 QUALITY ASSURANCE**

- A. 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 mockup of each type of floor tile installation.
  2. Build mockup of each type of wall tile installation.
  3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

**1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

- D. Store liquid materials in unopened containers and protected from freezing.

### **1.09 FIELD 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**

### **2.01 MANUFACTURERS**

- A. Source Limitations for Tile: Obtain tile of each type and color or finish from single source or producer.
  - 1. Obtain tile of each type and color or finish 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 single manufacturer and each aggregate from single source or producer.
  - 1. Obtain setting and grouting materials, except for unmodified Portland cement and aggregate, from single manufacturer.
  - 2. Obtain waterproof membrane and crack isolation membrane, except for sheet products, from manufacturer of setting and grouting materials.

### **2.02 PRODUCTS, GENERAL**

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
  - 1. Provide tile complying with Standard grade requirements unless otherwise indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.
- C. Factory Blending: For tile exhibiting color variations within ranges, 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.
- D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.

1. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

## **2.03 TILE PRODUCTS**

- A. Basis of Design: Design is based on products indicated on Drawings. Subject to compliance with requirements, provide named products or comparable products approved by Architect.
- B. Trim Units: Provide trim units for ceramic tile and ceramic mosaic tile. Coordinated with color, shade and sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:
  1. Coved base for thinset mortar applications.
  2. Surface bullnose wainscot cap for thinset mortar installations.
  3. Internal Corners: Field-buttet square corners. For coved base and cap use angle pieces designed to fit with stretcher shapes.

## **2.04 SETTING MATERIALS**

- A. Latex-Portland Cement Mortar (Thinset): ANSI A118.4.
  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. Ardex Engineered Cements.
    - b. C-Cure.
    - c. Custom Building Products.
    - d. Laticrete International, Inc.
    - e. MAPEI Corporation.
    - f. Southern Grouts & Mortars, Inc.
  2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
  3. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.

## **2.05 GROUT MATERIALS**

- A. High-Performance Tile Grout: ANSI A118.7.
  1. Manufacturers: Basis of Design is products by Custom Building Products. 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. Ardex Engineered Cements.
  - b. C-Cure.
  - c. Laticrete International, Inc.
  - d. MAPEI Corporation.
- B. Grout for PregROUTed Tile Sheets: Same product used in factory to pregROUT tile sheets.

## **2.06 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. Metal Edge Strips: Aluminum, height to match tile and setting-bed thickness, designed specifically for flooring applications.
- 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. Schluter Systems.
    - b. Blanke Corporation.
    - c. Ceramic Tool Company, Inc.
- C. 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.

## **2.07 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**

### **3.01 EXAMINATION**

- 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 the Work.

1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
  2. Verify that concrete substrates for tile floors installed with thinset mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
    - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
    - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
  3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
  4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.
- C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

### **3.03 CERAMIC TILE INSTALLATION**

- A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
  1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
    - a. Tile floors in wet areas.
    - b. Tile floors consisting of rib-backed tiles.

- B. 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.
- C. 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.
- D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- E. Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush.
- F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. 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.
  - 2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
  - 3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
- G. Joint Widths: Unless otherwise indicated, install tile with joint widths recommended by tile manufacturer.
- H. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- I. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
  - 1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them or apply strip of crack suppression membrane over joints in concrete substrate according to tile manufacturer's recommendations and adjust exposed joint location as required and as approved by Architect.
  - 2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."
- J. Metal Edge Strips: Install at locations indicated and where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated.

### **3.04 ADJUSTING AND CLEANING**

- A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.
- B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
  - 1. Remove 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.

### **3.05 PROTECTION**

- A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- B. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

### **3.06 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE**

- A. Interior Floor Installations, Concrete Subfloor:
  - 1. Ceramic Tile Installation: TCNA F113; thinset mortar.
    - a. Ceramic Tile Type: As indicated on Drawings.
    - b. Thinset Mortar: Latex- portland cement mortar.
    - c. Grout:
      - 1) Joints 1/8 in. or Smaller: High-performance unsanded grout.
      - 2) Joints Larger than 1/8 in.: High-performance sanded grout.
  - 2. Floor Joints: Movement joint design in thinset floors and perimeter joints; TCNA EJ171.
- B. Interior Wall Installations, Metal Studs or Furring:
  - 1. Ceramic Tile Installation: TCNA W245 or TCNA W248; thinset mortar on glass-mat, water-resistant gypsum backer board.

- a. Ceramic Tile Type: As indicated on Drawings.
- b. Thinset Mortar: Latex- portland cement mortar.
- c. Grout:
  - 1) Joints 1/8 in. or Smaller: High-performance unsanded grout.
  - 2) Joints Larger than 1/8 in.: High-performance sanded grout.

**END OF SECTION**



**SECTION 09 51 13**  
**ACOUSTICAL PANEL CEILINGS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes acoustical panels installed in exposed suspension systems.

**1.02 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of sizes indicated below:
1. Acoustical Panels: Set of 6-inch-square Samples of each type, color, pattern, and texture.
  2. Exposed Suspension-System Members, Moldings, and Trim: Set of 6-inch- long Samples of each type, finish, and color.

**1.04 INFORMATIONAL SUBMITTALS**

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
1. Ceiling suspension-system members.
  2. Structural members to which suspension systems will be attached.
  3. Method of attaching hangers to building structure.
  4. Carrying channels or other supplemental support for hanger-wire attachment where conditions do not permit installation of hanger wires at required spacing.
  5. Size and location of initial access modules for acoustical panels.
  6. Items penetrating finished ceiling and ceiling-mounted items including the following:
    - a. Lighting fixtures.
    - b. Diffusers.
    - c. Grilles.
    - d. Speakers.
    - e. Sprinklers.

- f. Access panels.
  - g. Perimeter moldings.
7. Minimum Drawing Scale: 1/8 inch = 1 foot.

### **1.05 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For finishes to include in maintenance manuals.

### **1.06 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Acoustical Ceiling Units: Full-size panels equal to 2 percent of quantity installed.
  - 2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.

### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver acoustical panels, suspension-system components, and accessories to Project site 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.

### **1.08 FIELD CONDITIONS**

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, 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.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Source Limitations: Obtain each type of acoustical ceiling panel and its supporting suspension system from single source from single manufacturer.

## 2.02 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Flame-Spread Index: Class A according to ASTM E 1264.
  2. Smoke-Developed Index: 450 or less.

## 2.03 ACOUSTICAL PANELS

- A. General:
1. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E 1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.
  2. Source Limitations:
    - a. Acoustical Ceiling Panel: Obtain each type from single source from single manufacturer.
    - b. Suspension System: Obtain each type from single source from single manufacturer.
- B. Acoustical Panels:
1. Basis of Design: Design is based on Armstrong World Industries, Inc. Fine Fissured High NRC. Subject to compliance with requirements, provide named product or comparable product approved by Architect manufactured by one of the following:
    - a. CertainTeed Corporation.
    - b. USG Corporation.
  2. Classification: Provide panels as follows:
    - a. Type and Form: Type III, mineral base with painted finish; Form 2, water felted.
    - b. Pattern: CE (perforated, small holes and lightly textured).
  3. Color: White.
  4. Light Reflectance (LR): Not less than 0.85.
  5. Noise Reduction Coefficient (NRC): Not less than 0.70.
  6. Edge/Joint Detail: Square.
  7. Thickness: 3/4 inch.
  8. Modular Size: As indicated on Drawings.

## 2.04 METAL SUSPENSION SYSTEM

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

1. Armstrong World Industries, Inc.
  2. CertainTeed Corporation.
  3. Chicago Metallic Corporation.
  4. USG Corporation.
- B. Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C 635/C 635M and designated by type, structural classification, and finish indicated.
- C. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized, G30 coating designation; with prefinished 15/16-inch-wide metal caps on flanges.
1. Structural Classification: Intermediate-duty system.
  2. End Condition of Cross Runners: Override (stepped) or butt-edge type.
  3. Face Design: Flat, flush.
  4. Cap Material: Cold-rolled steel.
  5. Cap Finish: Painted white.

## 2.05 ACCESSORIES

- A. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
- B. Wire Hangers, Braces, and Ties: Provide wires as follows:
1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
  2. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.106-inch-diameter wire.
- C. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.
- D. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.
- E. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch-thick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 coating designation; with bolted connections and 5/16-inch-diameter bolts.

## 2.06 METAL EDGE MOLDINGS AND TRIM

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

1. Armstrong World Industries, Inc.
  2. CertainTeed Corporation.
  3. Chicago Metallic Corporation.
  4. Fry Reglet Corporation.
  5. Gordon, Inc.
  6. USG Corporation.
- B. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.
1. Edge moldings shall fit acoustical panel edge details and suspension systems indicated and match width and configuration of exposed runners unless otherwise indicated.
  2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
- C. Extruded-Aluminum Edge Moldings and Trim: Where indicated, provide manufacturer's extruded-aluminum edge moldings and trim of profile indicated or referenced by manufacturer's designations, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements.
1. Baked-Enamel or Powder-Coat Finish: Minimum dry film thickness of 1.5 mils. Comply with ASTM C 635/C 635M and coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

## **2.07 ACOUSTICAL SEALANT**

- A. Acoustical Sealant: As specified in Division 07 Section "Acoustical Joint Sealants."

## **PART 3 - EXECUTION**

### **3.01 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. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 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 unless otherwise indicated, and comply with layout shown on reflected ceiling plans.
- B. Layout openings for penetrations centered on the penetrating items.

### **3.03 INSTALLATION**

- A. Install acoustical panel ceilings according to ASTM C 636/C 636M and manufacturer's written instructions.
- B. 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 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.
  - 4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure 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. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
  - 6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
  - 7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
  - 8. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
  - 9. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
  - 1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
  - 2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends. Miter corners accurately and connect securely.
  - 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. 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 precise fit.
  - 1. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
  - 2. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal
  - 3. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

### **3.04 ERECTION TOLERANCES**

- A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet, non-cumulative.
- B. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8 inch in 12 feet, non-cumulative.

### **3.05 ADJUSTING AND CLEANING**

- A. Replace damaged and broken panels.
- 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.
- C. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

## **END OF SECTION**

**SECTION 09 65 13**  
**RESILIENT BASE AND ACCESSORIES**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Resilient base.
  - 2. Resilient molding accessories.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Samples for Initial Selection: For each type of product indicated.
- C. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches long.
- D. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

**1.03 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

**1.04 QUALITY ASSURANCE**

- A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Coordinate mockups in this Section with mockups specified in other Sections.



### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

### **1.06 FIELD CONDITIONS**

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products 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 55 deg F or more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

### **1.07 WARRANTY**

- A. Special Installer's Warranty: Installer agrees to repair or replace resilient base installations that fail in workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, delamination from substrate.
  - 2. Warranty includes costs for replacement materials and installation.
  - 3. Warranty Period: 3 years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.01 THERMOSET-RUBBER BASE**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  - 1. Flexco.
  - 2. Johnsonite; a Tarkett company.
  - 3. Roppe Corporation.
- B. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).

- C. Thickness: 0.125 inch.
- D. Height: 4 inches.
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Preformed.
- G. Inside Corners: Preformed.
- H. Colors: As indicated by manufacturer's designations or if not indicated as selected by Architect from full range of industry colors Insert colors.

## **2.02 RESILIENT MOLDING ACCESSORY**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  - 1. Flexco.
  - 2. Johnsonite; a Tarkett company.
  - 3. Roppe Corporation.
- B. Description: Resilient carpet edge for glue-down applications, reducer strip for resilient flooring, and joiner for tile and carpet.
- C. Profile and Dimensions: As indicated on Drawings.
- D. Colors and Patterns: As indicated by manufacturer's designations or if not indicated as selected by Architect from full range of industry colors.

## **2.03 INSTALLATION MATERIALS**

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

## **PART 3 - EXECUTION**

### **3.01 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 resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
  1. Installation of resilient products indicates acceptance of surfaces and conditions.

### **3.02 PREPARATION**

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates for Resilient Accessories: Prepare horizontal surfaces 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 manufacturer. Do not use solvents.
  3. Alkalinity and Adhesion Testing: Perform tests recommended by 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 pH.
  4. Moisture Testing: Proceed with installation only after substrates pass testing according to manufacturer's written recommendations, but not less stringent than the following:
    - a. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient products 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 products and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

### **3.03 RESILIENT BASE INSTALLATION**

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.

### **3.04 RESILIENT ACCESSORY INSTALLATION**

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

### **3.05 CLEANING AND PROTECTION**

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
  - 1. Remove adhesive and other blemishes from exposed surfaces.
  - 2. Sweep and vacuum horizontal surfaces thoroughly.
  - 3. Damp-mop horizontal surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

**END OF SECTION**

**SECTION 09 65 19**  
**RESILIENT TILE FLOORING**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes vinyl tile (LVT).
- B. Related Sections include Division 09 Section "Resilient Base and Accessories" for resilient base and moldings installed with resilient tile flooring.

**1.02 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.

**1.03 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

**1.04 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

**1.05 QUALITY ASSURANCE**

- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Coordinate mockups in this Section with mockups specified in other Sections.
  - 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.

#### **1.06 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 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

#### **1.07 FIELD CONDITIONS**

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following 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 55 deg F or more than 95 deg F.
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

### **PART 2 - PRODUCTS**

#### **2.01 SOLID VINYL FLOOR TILE**

- A. Basis of Design: Design is based on products indicated on Drawings. Subject to compliance with requirements, provide named products or comparable products manufactured by one of the following as approved by Architect:
  1. Armstrong World Industries, Inc.
  2. Congoleum Corporation.

3. Johnsonite; a Tarkett company.
  4. Mannington Mills, Inc.
  5. Patcraft; a division of Shaw Industries, Inc.
  6. Shaw Contract Group; a Berkshire Hathaway company.
  7. TOLI International.
- B. Tile Standard: ASTM F 1700.
1. Class: Class III, Printed Film Vinyl Tile.
  2. Type: A, Smooth Surface.
- C. Size: As indicated on Drawings.
- D. Colors and Patterns: As indicated by manufacturer's designations or if not indicated as selected by Architect from full range of industry colors.

## **2.02 INSTALLATION MATERIALS**

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-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**

### **3.01 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 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 3 lb of water/1000 sq. ft. in 24 hours.
- C. Fill cracks, holes, and depressions in substrates with trowelable 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.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

### **3.02 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 in pattern indicated or as directed by Architect.
- 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 with grain direction alternating in adjacent tiles (basket-weave pattern).
- 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. 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.

### **3.03 CLEANING AND PROTECTION**

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.



- B. Cover floor tile until Substantial Completion.

**END OF SECTION**

**SECTION 09 68 13**  
**TILE CARPETING**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes modular, tufted carpet tile.

**1.02 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show the following:
  - 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
  - 2. Type of subfloor.
  - 3. Type of installation.
  - 4. Pattern of installation.
  - 5. Pattern type, location, and direction.
  - 6. Pile direction.
- C. Samples: For each exposed product and for each color and texture specified.

**1.04 INFORMATIONAL SUBMITTALS**

- A. Sample warranty.

**1.05 CLOSEOUT SUBMITTALS**

- A. Maintenance data.

**1.06 QUALITY ASSURANCE**

- A. Fire-Test-Response Ratings: Where indicated, provide carpet tile identical to those of assemblies tested for fire response according to NFPA 253 by a qualified testing agency.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with CRI 104.

**1.08 FIELD CONDITIONS**

- A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.

**1.09 WARRANTY**

- A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
  2. Failures include, but are not limited to, more than 10 percent edge raveling, snags, runs, dimensional stability, excess static discharge, loss of tuft bind strength, loss of face fiber, and delamination.
  3. Warranty Period: 10 years from date of Substantial Completion.

**PART 2 - PRODUCTS**

**2.01 CARPET TILE**

- A. Basis of Design: Design is based on products indicated on Drawings. Subject to compliance with requirements, provide named products or comparable products manufactured by one of the following as approved by Architect:
1. Interface, LLC.
  2. Milliken & Company.
  3. Mohawk Group (The); Mohawk Carpet, LLC.
  4. Tandus; a Tarkett company.
- B. Color: As indicated by manufacturer's designations or if not indicated as selected by Architect from full range of industry colors.
- C. Pattern: Match Architect's samples.

**2.02 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.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Examine carpet tile for type, color, pattern, and potential defects.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Preparation: Comply with CRI's "Carpet Installation Standard 2011" and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.
- E. Installation: Comply with CRI's "Carpet Installation Standard 2011", Section 18, "Modular Carpet," and with carpet tile manufacturer's written installation instructions.
- F. Installation Method: As recommended in writing by carpet tile manufacturer.
- G. Maintain dye lot integrity. Do not mix dye lots in same area.
- H. 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.
- I. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- J. 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.
- K. Install pattern parallel to walls and borders.
- L. Perform the following operations immediately after installing carpet tile:
  - 1. Remove excess adhesive, seam sealer, 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.

- M. Protect installed carpet tile to comply with CRI 104, Section 16, "Protecting Indoor Installations."

**END OF SECTION**

**SECTION 09 91 13**  
**EXTERIOR PAINTING**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes surface preparation and the application of paint systems on the following exterior substrates:
1. Concrete.
  2. Steel and iron.
  3. Galvanized metal.

**1.02 DEFINITIONS**

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
- B. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
1. Submit Samples on rigid backing, 8 inches square.
  2. Apply coats on Samples in steps to show each coat required for system.
  3. Label each coat of each Sample.
  4. Label each Sample for location and application area.
- C. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

**1.04 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Paint: 10 percent, but not less than 1 gal. of each material and color applied.

**1.05 QUALITY ASSURANCE**

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
    - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
    - b. Other Items: Architect will designate items or areas required.
  - 2. Final approval of color selections will be based on mockups.
    - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
  - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- B. Mockups: Provide paint products required to construct integrated exterior mockup specified in Division 01 Section "Mockups."

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
  - 1. Maintain containers in clean condition, free of foreign materials and residue.
  - 2. Remove rags and waste from storage areas daily.

**1.07 FIELD CONDITIONS**

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

### **1.08 WARRANTY**

- A. Special Warranty: Installer's form acceptable to the Owner in which Installer agrees to repair or replace painted coatings that fail within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Becoming unserviceable or developing an objectionable appearance including:
      - 1) Changing color or darkening noticeably by yellowing, streaking, blooming.
      - 2) Mildewing.
      - 3) Peeling, cracking, blistering, or alligatoring.
      - 4) Release from substrate.
      - 5) Chalking or dusting.
      - 6) Changing sheen in irregular fashion.
      - 7) Softening or becoming tacky and bubbling.
  - 2. Warranty Period: Two years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Basis of Design: Design is based on products manufactured by Sherwin-Williams scheduled in Part 3. Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  - 1. Benjamin Moore & Co.
  - 2. PPG Architectural Finishes, Inc.

### **2.02 PAINT, GENERAL**

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
  - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.



2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. Colors: As indicated in a color schedule or if not indicated as selected by Architect from manufacturer's full range.

### **2.03 SOURCE QUALITY CONTROL**

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
  2. Testing agency will perform tests for compliance with product requirements.
  3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
1. Concrete: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

### **3.02 PREPARATION**

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
  - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
  - 1. SSPC-SP 2.
- F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

### **3.03 APPLICATION**

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
  - 1. Use applicators and techniques suited for paint and substrate indicated.
  - 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
  - 3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.

4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
  5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
1. Paint the following work where exposed to view:
    - a. Equipment, including panelboards and switch gear.
    - b. Uninsulated metal piping.
    - c. Uninsulated plastic piping.
    - d. Pipe hangers and supports.
    - e. Metal conduit.
    - f. Plastic conduit.
    - g. Tanks that do not have factory-applied final finishes.

### **3.04 FIELD QUALITY CONTROL**

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
1. Contractor shall touch up and restore painted surfaces damaged by testing.
  2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

### **3.05 CLEANING AND PROTECTION**

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

### **3.06 EXTERIOR PAINTING SCHEDULE**

#### A. Concrete Substrates, Nontraffic Surfaces:

- 1. Latex System MPI EXT 3.1K:
  - a. Prime Coat: Latex, exterior, matching topcoat.
  - b. Topcoat: Latex, exterior, flat (MPI Gloss Level 1), MPI #10.
    - 1) Basis of Design: Sherwin Williams LOXON XP Waterproofing System A24-1400 Series.
  - c. Apply each coat at 14-18 mils wet (6.4 – 8.3 mils dft).

#### B. Steel and Iron Substrates:

- 1. Water-Based Light Industrial Coating System MPI EXT 5.1M:
  - a. Prime Coat: Primer, rust inhibitive, water based MPI #107.
    - 1) Sherwin Williams Pro-Cryl Pro Industrial Universal Primer.
  - b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
  - c. Topcoat: Light industrial coating, exterior, water based, gloss (MPI Semi-Gloss Level 5), MPI #163.

#### C. Galvanized-Metal Substrates:

- 1. Water-Based Light Industrial Coating System MPI EXT 5.3J:
  - a. Prime Coat: Primer, galvanized, water based, MPI #134.
  - b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
  - c. Topcoat: Light industrial coating, exterior, water based, gloss (MPI Semi-Gloss Level 5), MPI #163.

**END OF SECTION**

**SECTION 09 91 23**  
**INTERIOR PAINTING**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
1. Steel and iron.
  2. Galvanized metal.
  3. Gypsum board.

**1.02 DEFINITIONS**

- A. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- B. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
- B. Samples: For each type of paint system and in each color and gloss of topcoat.

**1.04 QUALITY ASSURANCE**

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
    - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
    - b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mockups.
  - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
  1. Maintain containers in clean condition, free of foreign materials and residue.
  2. Remove rags and waste from storage areas daily.

#### **1.06 FIELD CONDITIONS**

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

#### **1.07 WARRANTY**

- A. Special Warranty: Installer's form acceptable to the Owner in which Installer agrees to repair or replace painted coatings that fail within specified warranty period.
  1. Failures include, but are not limited to, the following:
    - a. Becoming unserviceable or developing an objectionable appearance including:
      - 1) Changing color or darkening noticeably by yellowing, streaking, blooming.
      - 2) Mildewing.
      - 3) Peeling, cracking, blistering, or alligating.
      - 4) Release from substrate.
      - 5) Chalking or dusting.
      - 6) Changing sheen in irregular fashion.
      - 7) Softening or becoming tacky and bubbling.
  2. Warranty Period: Two years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.01 PERFORMANCE**

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify product containers with appropriate markings of applicable testing agency.
  - 1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
  - 2. Smoke-Developed Index: 25 or less.

### **2.02 MANUFACTURERS**

- A. Basis of Design: Design is based on products manufactured by Sherwin-Williams scheduled in Part 3. Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  - 1. Benjamin Moore & Co.
  - 2. PPG Architectural Finishes, Inc.

### **2.03 PAINT, GENERAL**

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
  - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
  - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. Colors: As indicated in a color schedule or if not indicated as selected by Architect from manufacturer's full range.

### **2.04 SOURCE QUALITY CONTROL**

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
  - 1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
  - 2. Testing agency will perform tests for compliance with product requirements.

3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
  1. Gypsum Board: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
  1. Application of coating indicates acceptance of surfaces and conditions.

### **3.02 PREPARATION**

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

### **3.03 APPLICATION**

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."



- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

### **3.04 FIELD QUALITY CONTROL**

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
  - 1. Touch up and restore painted surfaces damaged by testing.
  - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

### **3.05 INTERIOR PAINTING SCHEDULE**

- A. Steel Substrates:

- 1. Water-Based Light Industrial Coating System MPI INT 5.1B:
  - a. Prime Coat: Primer, rust-inhibitive, water based MPI #107.
  - b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
  - c. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5), MPI #153.

- B. Galvanized-Metal Substrates:

- 1. Water-Based Light Industrial Coating System MPI INT 5.3B:
  - a. Prime Coat: Primer, galvanized, water based, MPI #134.
  - b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
  - c. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5), MPI #153.

- C. Gypsum Board Substrates for Typical Applications:

- 1. High-Performance Architectural Latex System MPI INT 9.2B:
  - a. Prime Coat: Primer sealer, latex, interior, MPI #50.
    - 1) Basis of Design: Sherwin-Williams ProMar 200 Zero Interior Latex Primer.
  - b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.

- c. Topcoat: Latex, interior, high performance architectural (MPI Gloss Level 3), MPI #139.
  
- D. Gypsum Board Substrates at service areas:
  - 1. Epoxy-Modified Latex System MPI INT 9.2F:
    - a. Prime Coat: Primer sealer, latex, interior, MPI #50.
    - b. Intermediate Coat: Epoxy-modified latex, matching topcoat.
    - c. Topcoat: Epoxy-modified latex, gloss (MPI Gloss Level 6), MPI #115.

**END OF SECTION**

**SECTION 09 97 24**  
**PENETRATING LIQUID FLOOR TREATMENT**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes penetrating liquid floor treatment applied to cured concrete.

**1.02 SUBMITTALS**

- A. Product Data: For each type of product indicated.

**1.03 QUALITY ASSURANCE**

- A. Source Limitations: Obtain penetrating liquid floor treatment materials through one source from a single manufacturer.

**PART 2 - PRODUCTS**

**2.01 FLOOR AND SLAB TREATMENTS**

- A. 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. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Burke by Edoco; Titan Hard.
    - b. Curecrete Distribution Inc.; Ashford Formula.
    - c. Dayton Superior Corporation; Day-Chem Sure Hard.
    - d. Euclid Chemical Company (The); Euco Diamond Hard.
    - e. Meadows, W. R., Inc.; Liqui-Hard.
    - f. Symons Corporation, a Dayton Superior Company; Buff Hard.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Clean substrates of substances that could impair application of penetrating liquid floor treatment, including dirt, oil, grease, and paints.

### **3.02 LIQUID FLOOR TREATMENTS**

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.
  - 1. Apply to concrete that is fully cured; do not apply to concrete that is less than 28 days' old.
  - 2. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.

### **3.03 CLEANING AND PROTECTION**

- A. Protect work of other trades against damage from floor treatment application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

**END OF SECTION**

**SECTION 10 11 00**  
**VISUAL DISPLAY UNITS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Visual display board assemblies.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, finishes, and accessories for visual display units.
- B. Shop Drawings: For visual display units.
  - 1. Include plans, elevations, sections, details, and attachment to other work.
  - 2. Show locations of panel joints.
  - 3. Show locations and layout of special-purpose graphics.
  - 4. Include sections of typical trim members.
- C. Samples: For each type of visual display unit indicated.
  - 1. Visual Display Panel: Not less than 8-1/2 by 11 inches, with facing, core, and backing indicated for final Work. Include one panel for each type, color, and texture required.
  - 2. Trim: 6-inch-long sections of each trim profile.
  - 3. Display Rail: 6-inch-long section of each type.
  - 4. Rail Support System: 6-inch-long sections.
  - 5. Accessories: Full-size Sample of each type of accessory.
- D. Product Schedule: For visual display units.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.
- B. Sample Warranties: For manufacturer's special warranties.

**1.04 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For visual display units to include in maintenance manuals.

**1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver factory-fabricated visual display units completely assembled in one piece. If dimensions exceed maximum manufactured unit size, or if unit size is impracticable to ship in one piece, provide two or more pieces with joints in locations indicated on approved Shop Drawings.

**1.07 FIELD CONDITIONS**

- A. Environmental Limitations: Do not deliver or install visual display units until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

**1.08 WARRANTY**

- A. Special Warranty for Porcelain-Enamel Face Sheets: Manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Surfaces lose original writing and erasing qualities.
    - b. Surfaces exhibit crazing, cracking, or flaking.
  - 2. Warranty Period: 50 years from date of Substantial Completion.

**PART 2 - PRODUCTS**

**2.01 PERFORMANCE REQUIREMENTS**

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Flame-Spread Index: 25 or less.

2. Smoke-Developed Index: 50 or less.

## **2.02 VISUAL DISPLAY BOARD ASSEMBLY**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  1. A-1 Visual Systems.
  2. Architectural School Products Ltd.
  3. Claridge Products and Equipment, Inc.
  4. Marsh Industries, Inc.
  5. Peter Pepper Products, Inc.
- B. Visual Display Board Assembly: Field or factory fabricated.
  1. Assembly: Markerboard.
  2. Corners: Square.
  3. Width: As indicated on Drawings.
  4. Height: As indicated on Drawings.
  5. Mounting Method: Direct to wall.
- C. Markerboard Panel: Porcelain-enamel-faced markerboard panel on core indicated.
  1. Color: White.
- D. Visual Display Board Assembly: Field or factory fabricated.
  1. Assembly: Tackboard.
  2. Corners: Square.
  3. Width: As indicated on Drawings.
  4. Height: As indicated on Drawings.
- E. Tackboard Panel: Vinyl-fabric-faced tackboard panel on core indicated.
  1. Color and Pattern: As selected by Architect from full range of industry colors.
- F. Starter Kits: Provide starter kits for each visual display board assembly, and installation of visual display wall covering consisting of the following:
  1. Not less than six markers in assorted colors.
  2. Markerboard cleaner in spray bottle, not less than 4 fl. oz.
  3. One eraser for each markerboard surface, but not less than 2 per room.

## **2.03 MATERIALS**

- A. Porcelain-Enamel Face Sheet: PEI-1002, with face sheet manufacturer's standard two- or three-coat process.

- B. Vinyl Fabric: Mildew resistant, washable, complying with ASTM F 793/F 793M, Type II, burlap weave; weighing not less than 13 oz./sq. yd.; with surface-burning characteristics indicated.
- C. Hardboard: ANSI A135.4, tempered.
- D. Particleboard: ANSI A208.1, Grade M-1.
- E. MDF: ANSI A208.2, Grade 130.
- F. Extruded Aluminum: ASTM B 221, Alloy 6063.
- G. Adhesives for Field Application: Mildew-resistant, nonstaining adhesive for use with specific type of panels, sheets, or assemblies; and for substrate application; as recommended in writing by visual display unit manufacturer.

#### **2.04 GENERAL FINISH REQUIREMENTS**

- A. Comply with NAAMM/NOMMA 500 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. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

#### **2.05 ALUMINUM FINISHES**

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.
- B. Examine walls and partitions for proper preparation and backing for visual display units.
- C. Examine walls and partitions for suitable framing depth where sliding visual display units will be installed.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.



### **3.02 PREPARATION**

- A. Comply with manufacturer's written instructions for surface preparation.
- B. Clean substrates of substances, such as dirt, mold, and mildew, that could impair the performance of and affect the smooth, finished surfaces of visual display boards.
- C. Prepare surfaces to achieve a smooth, dry, clean surface free of flaking, unsound coatings, cracks, defects, projections, depressions, and substances that will impair bond between visual display units and wall surfaces.
- D. Prime wall surfaces indicated to receive visual display units and as recommended in writing by primer/sealer manufacturer and visual display unit manufacturer.

### **3.03 INSTALLATION**

- A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.
- B. Field-Assembled Visual Display Board Assemblies: Coordinate field-assembled units with grounds, trim, and accessories indicated. Join parts with a neat, precision fit.
  - 1. Make joints only where total length exceeds maximum manufactured length. Fabricate with minimum number of joints, balanced around center of board, as acceptable to Architect.
  - 2. Where size of visual display board assemblies or other conditions require support in addition to normal trim, provide structural supports or modify trim as indicated or as selected by Architect from manufacturer's standard structural support accessories to suit conditions indicated.
- C. Factory-Fabricated Visual Display Board Assemblies: Attach concealed clips, hangers, and grounds to wall surfaces and to visual display board assemblies with fasteners at not more than 16 inches o.c. Secure tops and bottoms of boards to walls.
- D. Visual Display Board Assembly Mounting Heights: Install visual display units at mounting heights indicated on Drawings.

### **3.04 CLEANING AND PROTECTION**

- A. Clean visual display units in accordance with manufacturer's written instructions. Attach one removable cleaning instructions label to visual display unit in each room.
- B. Touch up factory-applied finishes to restore damaged or soiled areas.
- C. Cover and protect visual display units after installation and cleaning.

- D. Place starter kit for each installation of dry-erase wall covering in each room as directed by Architect before Substantial Completion,

**END OF SECTION**

**SECTION 10 14 00**  
**SIGNAGE**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes the following types of signage selected by the Owner under specified allowance:
  - 1. Cast metal dedication plaque.
  - 2. Dimensional letter signage for building identification.
  - 3. Exterior and interior panel signs.
- B. Related Sections include Division 01 Section "Allowances" for Schedule of Allowances applicable to the Work of this Section.

**PART 2 - PRODUCTS**

**2.01 SIGNAGE**

- A. As selected by Owner under specified Allowance.
  - 1. Allowance includes fasteners and accessories required for complete installation.

**PART 3 - EXECUTION**

**3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 ADJUSTING AND CLEANING**

- A. Remove and replace damaged or deformed signage and signage units that do not comply with specified requirements. Replace signage with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

- B. Remove temporary protective coverings and strippable films as signs are installed.
- C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signage in a clean condition during construction and protect from damage until acceptance by Owner.

**END OF SECTION**

**SECTION 10 22 13**  
**WIRE MESH PARTITIONS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes interior, standard-duty wire mesh partitions.

**1.02 DEFINITIONS**

- A. Intermediate Crimp: Wires pass over one and under the next adjacent wire in both directions, with wires crimped before weaving and with extra crimps between the intersections.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings:
  - 1. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification: 12-by-12-inch panel constructed of specified frame members and wire mesh. Show method of finishing members at intersections.
- E. Delegated-Design Submittal: For wire mesh partitions indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

**1.04 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.
- B. Welding certificates.

**1.05 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For wire mesh partition hardware to include in maintenance manuals.

### **1.06 QUALITY ASSURANCE**

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - 2. AWS D1.3, "Structural Welding Code - Sheet Steel."
- C. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials, fabrication, and installation.
  - 1. Build mockup of typical wire mesh partition bay as 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.

### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver wire mesh items with cardboard protectors on perimeters of panels and doors and with posts wrapped to provide protection during transit and Project-site storage. Use vented plastic.

### **1.08 FIELD CONDITIONS**

- A. Field Measurements: Verify actual dimensions of construction contiguous with wire mesh units by field measurements before fabrication.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  - 1. Acorn Wire & Iron Works, LLC.
  - 2. American Woven Wire Corporation.
  - 3. Indiana Wire Products, Inc.
  - 4. Kenco Wire & Iron Products Inc.
  - 5. King Wire Partitions, Inc.
  - 6. Standard Wire & Steel Works.
  - 7. WireCrafters, LLC.

## **2.02 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design wire mesh units.
- B. Structural Performance: Wire mesh units shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.
  - 1. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft. at any location on a panel.
  - 2. Total load of 200 lbf applied uniformly over each panel.
  - 3. Concentrated load and total load need not be assumed to act concurrently.

## **2.03 MATERIALS**

- A. Steel Wire: ASTM A 510.
- B. Steel Plates, Channels, Angles, and Bars: ASTM A 36/A 36M.
- C. Steel Sheet: Cold-rolled steel sheet, ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
- D. Steel Pipe: ASTM A 53/A 53M, Schedule 40, unless another weight is indicated or required by structural loads.
- E. Steel Tubing: ASTM A 500/A 500M, cold-formed structural-steel tubing or ASTM A 513, Type 5, mandrel-drawn mechanical tubing.
- F. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with G60 zinc (galvanized) or A60 zinc-iron-alloy (galvannealed) coating designation.
- G. Panel-to-Panel Fasteners: Manufacturer's standard steel bolts, nuts, and washers.
- H. Post-Installed Anchors: Capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
  - 1. Material for Interior Locations: Carbon-steel components are zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
  - 2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.
- I. Power-Driven Fasteners: ICC-ES AC70.
- J. Shop Primers: Provide primers that comply with Division 09 Section "Exterior Painting."

## 2.04 STANDARD-DUTY WIRE MESH PARTITIONS

- A. Mesh: 0.135-inch-diameter, intermediate-crimp steel wire woven into 1-1/2-inch diamond mesh.
- B. Vertical Panel Framing: 1-1/4-by-5/8-by-0.080-inch cold-rolled, C-shaped steel channels with holes for 1/4-inch-diameter bolts not more than 12 inches o.c.
- C. Horizontal Panel Framing: 1-by-1/2-by-1/8-inch cold-rolled steel channels.
- D. Horizontal Panel Stiffeners: Two cold-rolled steel channels, 3/4 by 3/8 by 1/8 inch, bolted or riveted toe to toe through mesh or one 1-by-1/2-by-1/8-inch cold-rolled steel channel with wire mesh woven through channel.
- E. Top Capping Bars: 2-1/4-by-1-inch cold-rolled steel channels.
- F. Posts for 90-Degree Corners: 1-1/4-by-1-1/4-by-1/8-inch steel angles or square tubes with holes for 1/4-inch-diameter bolts aligning with bolt holes in vertical framing; with floor anchor clips.
- G. Posts for Other-Than-90-Degree Corners: Steel pipe or tubing with holes for 1/4-inch-diameter bolts aligning with bolt holes in vertical framing; with floor anchor clips.
  - 1. Partitions up to 12 Feet High: 1-1/4-inch OD by 1/8 inch.
  - 2. Partitions up to 20 Feet High: 2-1/2-inch OD by 1/8 inch.
- H. Adjustable Corner Posts: Two 1-1/4-by-5/8-by-0.080-inch cold-rolled, C-shaped steel channels connected by steel hinges at 36 inches o.c., with holes for 1/4-inch-diameter bolts aligning with bolt holes in vertical framing.
- I. Line Posts: 3-inch-by-4.1-lb or 3-1/2-by-1-1/4-by-0.127-inch steel channels; with 1/4-inch steel base plates.
- J. Three-Way Intersection Posts: 1-1/4-by-1-1/4-by-1/8-inch steel tubes or channels, with holes for 1/4-inch-diameter bolts aligned for bolting to adjacent panels.
- K. Four-Way Intersection Posts: 1-1/4-by-1-1/4-by-1/8-inch steel tubes, with holes for 1/4-inch-diameter bolts aligned for bolting to adjacent panels.
- L. Floor Shoes: Metal, not less than 2 inches high; sized to suit vertical framing, drilled for attachment to floor, and with set screws for leveling adjustment.
- M. Swinging Doors: Fabricated from same mesh as partitions, with framing fabricated from 1-1/4-by-1/2-by-1/8-inch steel channels or 1-1/4-by-5/8-by-0.080-inch cold-rolled, C-shaped steel channels, banded with 1-1/4-by-1/8-inch flat steel bar cover plates on three sides, and with 1/8-inch-thick angle strike bar and cover on strike jamb.



1. Hinges: Full-surface type, 3-by-3-inch steel, three per door; bolted, riveted, or welded to door and jamb framing.
2. Cylinder Lock: Mortise type with cylinder specified in Division 08 Section "Door Hardware"; operated by key outside and lever inside.

N. Finish: Powder-coated finish unless otherwise indicated.

## **2.05 FABRICATION**

A. General: Fabricate wire mesh items from components of sizes not less than those indicated. Use larger-sized components as recommended by wire mesh item manufacturer. Furnish bolts, hardware, and accessories required for complete installation with manufacturer's standard finishes.

1. Fabricate wire mesh items to be readily disassembled.
2. Welding: Weld corner joints of framing and remove spatter.

B. Standard-Duty Wire Mesh Partitions: Fabricate wire mesh partitions with cutouts for pipes, ducts, beams, and other items indicated. Finish edges of cutouts to provide a neat, protective edge.

1. Mesh: Securely clinch mesh to framing.
2. Framing: Fabricate framing with mortise and tenon corner construction.
  - a. Provide horizontal stiffeners as indicated or, if not indicated, as required by panel height and as recommended by wire mesh partition manufacturer. Weld horizontal stiffeners to vertical framing.
  - b. Fabricate partition with slotted holes for connecting adjacent panels.
3. Fabricate wire mesh partitions with 3 to 4 inches of clear space between finished floor and bottom horizontal framing.

## **2.06 STEEL AND IRON FINISHES**

A. Powder-Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard baked-on powder-coat finish, suitable for use indicated, with a minimum dry film thickness of 2 mils.

1. Color and Gloss: As selected by Architect from manufacturer's full range.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

- B. Examine floors for suitable conditions where wire mesh items will be installed.
- C. Examine walls to which wire mesh items will be attached for properly located blocking, grounds, and other solid backing for attachment of support fasteners.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 WIRE MESH PARTITIONS ERECTION**

- A. Anchor wire mesh partitions to floor with 3/8-inch-diameter postinstalled expansion anchors at 12 inches o.c. through anchor clips located at each post and corner. Shim anchor clips as required to achieve level and plumb installation.
- B. Anchor wire mesh partitions to floor with 3/8-inch-diameter postinstalled expansion anchors at 12 inches o.c. through floor grommets located at each post and corner. Adjust wire mesh partition posts in floor grommets to achieve level and plumb installation.
- C. Anchor wire mesh partitions to walls at 12 inches o.c. through back corner panel framing and as follows:
  - 1. For concrete and solid masonry anchorage, use expansion anchors.
  - 2. For steel-framed gypsum board assemblies, fasten brackets directly to steel framing or concealed reinforcements using self-tapping screws of size and type required to support structural loads.
- D. Secure top capping bars to top framing channels with 1/4-inch-diameter "U" bolts spaced not more than 28 inches o.c.
- E. Provide line posts at locations indicated or, if not indicated, as follows:
  - 1. For partitions that are 7 to 9 feet high, spaced at 15 to 20 feet o.c.
  - 2. For partitions that are 10 to 12 feet high, located between every other panel.
  - 3. For partitions that are more than 12 feet high, located between each panel.
- F. Where standard-width wire mesh partition panels do not fill entire length of run, provide adjustable filler panels to fill openings.
- G. Install doors complete with door hardware.
- H. Weld or bolt accessories to wire mesh partition framing and doors where indicated.

### **3.03 ADJUSTING AND CLEANING**

- A. Adjust doors to operate smoothly and easily, without binding or warping. Adjust hardware to function smoothly. Confirm that latches and locks engage accurately and securely without forcing or binding.

- B. Remove and replace defective work, including framing that is warped, bowed, or otherwise unacceptable.
- C. Immediately after erection, clean field welds, bolted connections, and abraded areas. Apply powder coating to uncoated and abraded areas with the same material as used for initial coating and for touching up.

**END OF SECTION**

**SECTION 10 26 00**  
**WALL AND DOOR PROTECTION**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes corner guards.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, impact strength, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For each type of wall and door protection showing locations and extent.
  - 1. Include plans, elevations, sections, and attachment details.
- C. Samples for Verification: For each type of exposed finish on the following products, prepared on Samples of size indicated below:
  - 1. Corner Guards: 12 inches long. Include example top caps.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Sample Warranty: For special warranty.

**1.04 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For each type of wall and door protection product to include in maintenance manuals.
  - 1. Include recommended methods and frequency of maintenance for maintaining best condition of plastic covers under anticipated traffic and use conditions. Include precautions against using cleaning materials and methods that may be detrimental to finishes and performance.

### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Store wall and door protection in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.
  - 1. Maintain room temperature within storage area at not less than 70 deg F during the period plastic materials are stored.
  - 2. Keep plastic materials out of direct sunlight.
  - 3. Store plastic wall- and door-protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F.
    - a. Store corner-guard covers in a vertical position.

### **1.06 WARRANTY**

- A. Special Warranty: Manufacturer agrees to repair or replace components of wall- and door-protection units that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures including detachment of components from each other or from the substrates, delamination, and permanent deformation beyond normal use.
    - b. Deterioration of metals, metal finishes, plastics, and other materials beyond normal use.
  - 2. Warranty Period: Five years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Source Limitations: Obtain wall- and door-protection products of each type from single source from single manufacturer.

### **2.02 CORNER GUARDS**

- A. Surface-Mounted, Plastic-Cover Corner Guards: Manufacturer's standard assembly consisting of snap-on, resilient plastic cover installed over retainer; including mounting hardware; fabricated with 90- or 135-degree turn to match wall condition.
  - 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. Construction Specialties, Inc.
  - b. Inpro Corporation.
  - c. Korogard Wall Protection Systems; a division of RJF International Corporation.
  - d. Nystrom.
  - e. Pawling Corporation.
2. Cover: Extruded rigid plastic, minimum 0.078-inch wall thickness.
- a. Profile: Nominal 2-inch-long leg and 1/4-inch corner radius.
  - b. Height: 4 feet.
  - c. Color and Texture: As selected by Architect from manufacturer's full range.
3. Continuous Retainer: Minimum 0.060-inch-thick, one-piece, extruded aluminum.
4. Top and Bottom Caps: Prefabricated, injection-molded plastic; color matching cover; field adjustable for close alignment with snap-on cover.

### **2.03 MATERIALS**

- A. Polycarbonate Plastic Sheet: ASTM D 6098, S-PC01, Class 1 or Class 2, abrasion resistant; with a minimum impact-resistance rating of 15 ft.-lbf/in. of notch when tested according to ASTM D 256, Test Method A.
- B. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.
- C. Adhesive: As recommended by protection-product manufacturer.

### **2.04 FABRICATION**

- A. Fabricate wall and door protection according to requirements indicated for design, performance, dimensions, and member sizes, including thicknesses of components.

### **2.05 FINISHES**

- A. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
  - 1. For wall and door protection attached with adhesive, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Complete finishing operations, including painting, before installing wall and door protection.
- B. Before installation, clean substrate to remove dust, debris, and loose particles.

### **3.03 INSTALLATION**

- A. Installation Quality: Install wall and door protection according to manufacturer's written instructions, level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.

### **3.04 CLEANING**

- A. Immediately after completion of installation, clean plastic covers and accessories using a standard ammonia-based household cleaning agent.
- B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

**END OF SECTION**

**SECTION 10 28 00**  
**TOILET, BATH, AND LAUNDRY ACCESSORIES**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Public-use washroom accessories.
  - 2. Childcare accessories.

**1.02 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. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
  - 2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
  - 3. Include electrical characteristics.
- B. Samples: Full size, for each exposed product and for each finish specified.
- C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
  - 1. Identify locations using room designations indicated.
  - 2. Identify accessories using designations indicated.

**1.04 INFORMATIONAL SUBMITTALS**

- A. Sample Warranty: For manufacturer's special warranty.



**1.05 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For accessories to include in maintenance manuals.

**1.06 WARRANTY**

- A. Manufacturer's Special Warranty:
1. Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.
    - a. Failures include, but are not limited to, visible silver spoilage defects.
    - b. Warranty Period: 15 years from date of Substantial Completion.

**PART 2 - PRODUCTS**

**2.01 OWNER-FURNISHED MATERIALS**

- A. Owner-Furnished Materials:
1. Paper Towel Dispenser.
  2. Soap Dispenser.
  3. Waste Receptacle.

**2.02 PERFORMANCE REQUIREMENTS**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Structural Performance: Design accessories and fasteners to comply with the following requirements:
1. Grab Bars: Installed units are able to resist 250 lbf concentrated load applied in any direction and at any point.

**2.03 PUBLIC-USE WASHROOM ACCESSORIES**

- A. Source Limitations: Obtain public-use washroom accessories from single source from single manufacturer.
- B. Toilet Tissue (Roll) Dispenser:
1. American Specialties, Inc.
  2. Bobrick Washroom Equipment, Inc.
  3. Bradley Corporation.

4. Description: Double-roll dispenser.
5. Mounting: Surface mounted.
6. Operation: Noncontrol delivery with standard spindle.
7. Capacity: Designed for 4-1/2- or 5-inch- diameter tissue rolls.
8. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

C. Grab Bar:

1. American Specialties, Inc.
2. Bobrick Washroom Equipment, Inc.
3. Bradley Corporation.
4. Mounting: Flanges with concealed fasteners.
5. Material: Stainless steel, 0.05 inch thick.
6. Finish: Smooth, ASTM A480/A480M No. 4 finish (satin).

D. Sanitary-Napkin Disposal Unit:

1. American Specialties, Inc.
2. Bobrick Washroom Equipment, Inc.
3. Bradley Corporation.
4. Mounting: Surface mounted.
5. Door or Cover: Self-closing, disposal-opening cover.
6. Receptacle: Removable.
7. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

E. Mirror Unit:

1. American Specialties, Inc.
2. Bobrick Washroom Equipment, Inc.
3. Bradley Corporation.
4. Frame: Stainless steel channel.
  - a. Corners: Manufacturer's standard.
5. Size: As indicated on Drawings.
6. Hangers: Manufacturer's standard rigid, tamper and theft resistant.

F. Diaper-Changing Station:

1. American Specialties, Inc.
2. Bobrick Washroom Equipment, Inc.
3. Bradley Corporation.
4. Description: Horizontal unit that opens by folding down from stored position and with child-protection strap.
  - a. Engineered to support minimum of 250 lb static load when opened.
5. Mounting: Surface mounted, with unit projecting not more than 4 inches from wall when closed.

6. Operation: By pneumatic shock-absorbing mechanism.
7. Material and Finish: HDPE in manufacturer's standard color.
8. Liner Dispenser: Provide built-in dispenser for disposable sanitary liners.

## **2.04 MATERIALS**

- A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.
- B. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch minimum nominal thickness.
- C. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.
- D. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- E. 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.
- F. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- G. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

## **2.05 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**

### **3.01 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.
  1. Remove temporary labels and protective coatings.
- B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

**3.02 ADJUSTING AND CLEANING**

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Clean and polish exposed surfaces according to manufacturer's written instructions.

**END OF SECTION**

**SECTION 10 43 13**  
**DEFIBRILLATOR CABINETS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes recessed cabinets to receive AED furnished by the Owner.

**1.02 DEFINITION**

- A. Automatic External Defibrillator (AED): Device used to automatically treat a patient with cardiac arrest whose heart is beating irregularly (fibrillating).

**1.03 PREINSTALLATION CONFERENCE**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.04 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For AED cabinets. Include plans, elevations, sections, details, and attachments to other work.

**1.05 CLOSEOUT SUBMITTALS**

- A. Maintenance data.

**1.06 COORDINATION**

- A. Coordinate sizes and locations of AED cabinets with wall depths.

**PART 2 - PRODUCTS**

**2.01 MATERIALS**

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
- B. Aluminum: Alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated, and as follows:

1. Sheet: ASTM B 209.
  2. Extruded Shapes: ASTM B 221.
- C. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

## **2.02 AED CABINET**

- A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be included in the Work include, but are not limited to:
1. J. L. Industries, Inc., a division of Activar Construction Products Group.
  2. Modern Metal Products, Division of Technico Inc.
- B. Cabinet Type: Suitable for AED.
- C. Cabinet Construction: Nonrated.
- D. Cabinet Material: Baked-enamel steel sheet.
- E. Recessed Cabinet: Cabinet box recessed in walls of sufficient depth to suit style of trim indicated.
1. Square-Edge Trim: 1-1/4- to 1-1/2-inch backbend depth.
- F. Cabinet Trim Material: Baked-enamel steel sheet.
- G. Door Material: Baked-enamel steel sheet.
- H. Door Style: Center glass panel with frame.
- I. Door Glazing: Tempered glass.
- J. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
- K. Accessories:
1. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated.
    - a. Identify AED in cabinet with the words "Automated External Defibrillator" or "Emergency Defibrillator."
      - 1) Location: Applied to cabinet door or glazing.
      - 2) Application Process: Decal or factory painted.
      - 3) Lettering Color: Red.
      - 4) Orientation: Horizontal.

- L. Finishes for Steel: Manufacturer's standard baked-enamel paint.

### **2.03 FABRICATION**

- A. AED Cabinets: Provide manufacturer's standard box (tub), with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated. Miter and weld joints and grind smooth.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. Examine walls and partitions for suitable framing depth and blocking where recessed cabinets will be installed and prepare recesses as required by type and size of cabinet and trim style.
- B. AED Cabinets:
  - 1. Install AED cabinets at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.
  - 2. Fasten cabinets to structure, square and plumb.
  - 3. Adjust AED cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.
  - 4. Replace AED cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

**END OF SECTION**

**SECTION 10 44 13**  
**FIRE PROTECTION CABINETS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes fire-protection cabinets for portable fire extinguishers.

**1.02 PREINSTALLATION CONFERENCE**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review methods and procedures related to fire-protection cabinets including, but not limited to, schedules and coordination requirements.

**1.03 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For fire-protection cabinets to include in maintenance manuals.

**1.04 COORDINATION**

- A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.
- B. Coordinate sizes and locations of fire-protection cabinets with wall depths.

**PART 2 - PRODUCTS**

**2.01 FIRE-PROTECTION CABINET**

- A. Cabinet Type: Suitable for fire extinguisher.
  - 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. JL Industries, Inc.; a division of the Activar Construction Products Group.
    - b. Larsens Manufacturing Company.
    - c. Potter Roemer LLC.
- B. Cabinet Construction: Nonrated.



- C. Cabinet Material: Cold-rolled steel sheet.
- D. Semirecessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
  - 1. Square-Edge Trim: 1-1/4- to 1-1/2-inch backbend depth.
- E. Door Material: Steel sheet.
- F. Door Style: Solid opaque panel with frame.
- G. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
- H. Cabinet Trim Material: Same material and finish as door.
- I. Accessories:
  - 1. Door Lock: Cam lock that allows door to be opened during emergency by pulling sharply on door handle.
  - 2. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated or if not indicated as directed by Architect.
    - a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."
      - 1) Location: Applied to cabinet door.
      - 2) Application Process: Pressure-sensitive vinyl letters.
      - 3) Lettering Color: Red.
      - 4) Orientation: Horizontal.
- J. Materials:
  - 1. Cold-Rolled Steel: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
    - a. Finish:
      - 1) Cabinet: Baked enamel or powder coat.
        - a) Color: White.
      - 2) Door and Frame: Same finish as cabinet.

## **2.02 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.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine walls and partitions for suitable framing depth and blocking where cabinets will be installed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Prepare recesses for semi-recessed fire-protection cabinets as required by type and size of cabinet and trim style.

### **3.03 INSTALLATION**

- A. General: Install fire-protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.
- B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.
  - 1. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.
  - 2. Identification: Apply decals at locations indicated.

### **3.04 ADJUSTING AND CLEANING**

- A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets 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 and mounting bracket manufacturers.
- 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**

**SECTION 10 44 16**  
**FIRE EXTINGUISHERS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.
- B. Product Schedule: For fire extinguishers. Coordinate final fire-extinguisher schedule with fire-protection cabinet schedule to ensure proper fit and function. Use same designations indicated on Drawings.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Warranty: Sample of special warranty.

**1.04 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

**1.05 COORDINATION**

- A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

**1.06 WARRANTY**

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Six years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

### **2.02 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS**

- A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet and mounting bracket indicated.
  - 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. JL Industries, Inc.; a division of the Activar Construction Products Group.
    - b. Larsens Manufacturing Company.
    - c. Potter Roemer LLC.
  - 2. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.
- B. Multipurpose Dry-Chemical Type in Steel Container: UL-rated 4-A:60-B:C, 10-lb nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

### **2.03 MOUNTING BRACKETS**

- A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or red baked-enamel finish.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. JL Industries, Inc.; a division of the Activar Construction Products Group.
    - b. Larsens Manufacturing Company.
    - c. Potter Roemer LLC; a Division of Morris Group International.
- B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.

1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.
  - a. Orientation: Vertical.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. Examine fire extinguishers for proper charging and tagging.
  1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Install fire extinguishers in locations indicated and in compliance with requirements of authorities having jurisdiction.
  1. Mounting Brackets: Top of fire extinguisher to be at 42 inches above finished floor.
- C. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

**END OF SECTION**

**SECTION 10 56 13**  
**METAL STORAGE SHELVING**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes four-post metal storage shelving.

**1.02 COORDINATION**

- A. Coordinate sizes and locations of blocking and backing required for installation of metal storage shelving attached to wall and ceiling assemblies.
- B. Coordinate locations and installation of metal storage shelving that may interfere with ceiling systems including lighting, HVAC, speakers, sprinklers, access panels, electrical switches or outlets, and floor drains.

**1.03 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.04 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include rated capacities, construction details, material descriptions, dimensions of individual components and profiles, and finishes for metal storage shelving.
- B. Shop Drawings: For metal storage shelving.
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Include installation details of connectors, lateral bracing, and special bracing.
- C. Samples for Initial Selection: For each type of metal storage shelving with factory-applied color finishes.
  - 1. Include Samples of accessories involving color selection.
- D. Product Schedule: For metal storage shelving.

**1.05 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of metal storage shelving.

**1.06 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For metal storage shelving to include in maintenance manuals.

**1.07 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Shelves: Full-size units equal to 5 percent of amount installed for each type indicated, but no fewer than 5 shelves.
  - 2. Shelf-to-Post Connectors: Full-size units equal to 5 percent of amount installed for each type indicated, but no fewer than 10 connectors.

**1.08 QUALITY ASSURANCE**

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

**PART 2 - PRODUCTS**

**2.01 FOUR-POST METAL STORAGE SHELVING**

- A. Open Four-Post Metal Storage Shelving: Complying with MH 28.1 and field assembled from factory-formed components. Shelves span between supporting corner posts that allow shelf-height adjustment over full height of shelving unit. Provide fixed top and bottom shelves, adjustable intermediate shelves, and accessories indicated.
  - 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. Borroughs Corporation.
    - b. List Industries Inc.
    - c. Penco Products, Inc.
    - d. Safco Products Company.
    - e. Tensco.
- B. Open Four-Post Metal Storage Shelving Type A:

1. Load-Carrying Capacity per Shelf: As indicated on Drawings.
2. Posts: Fabricated from hot-rolled steel; in manufacturer's standard shape; with perforations at 1-1/2 inches o.c. to receive shelf-to-post connectors.
  - a. Unit Configuration: Configure shelving units as individual, freestanding assemblies.
  - b. Post Base: Adjustable steel floor plate, drilled for floor anchors.
3. Bracing: Manufacturer's standard, single or double diagonal cross bracing.
  - a. Location: At unit back and ends as required for stability, load-carrying capacity of shelves, and number of shelves indicated.
4. Solid-Type Shelves:
  - a. Metallic-Coated Steel Sheet: Nominal thickness 0.034 inch or as required for load-carrying capacity per shelf.
5. Shelf Quantity: Three shelves per shelving unit in addition to top and bottom shelf.
6. Shelf-to-Post Connectors: Manufacturer's standard connectors.
7. Base: Open, with exposed post legs.
8. Overall Unit Width: 36 inches, inclusive of two end posts.
9. Overall Unit Depth: 24 inches.
10. Overall Unit Height: 84 inches, inclusive of top shelf.
11. Steel Finish: Baked enamel.
  - a. Color and Gloss: As selected by Architect from manufacturer's full range.

**C. Open Four-Post Metal Storage Shelving Type B:**

1. Load-Carrying Capacity per Shelf: As indicated on Drawings.
2. Posts: Fabricated from hot-rolled steel; in manufacturer's standard shape; with perforations at 1-1/2 inches o.c. to receive shelf-to-post connectors.
  - a. Unit Configuration: Configure shelving units as individual, freestanding assemblies.
  - b. Post Base: Adjustable steel floor plate, drilled for floor anchors.
3. Bracing: Manufacturer's standard, single or double diagonal cross bracing.
  - a. Location: At unit back and ends as required for stability, load-carrying capacity of shelves, and number of shelves indicated.
4. Solid-Type Shelves:
  - a. Metallic-Coated Steel Sheet: Nominal thickness 0.034 inch or as required for load-carrying capacity per shelf.
5. Shelf Quantity: Three shelves per shelving unit in addition to top and bottom shelf.
6. Shelf-to-Post Connectors: Manufacturer's standard connectors.



7. Base: Open, with exposed post legs.
8. Overall Unit Width: 36 inches, inclusive of two end posts.
9. Overall Unit Depth: 30 inches.
10. Overall Unit Height: 96 inches, inclusive of top shelf.
11. Steel Finish: Baked enamel.

a. Color and Gloss: As selected by Architect from manufacturer's full range.

## **2.02 ANCHORS**

- A. Floor Anchors: Galvanized-steel, post-installed expansion anchors or threaded concrete screws. Provide number per unit recommended by manufacturer unless additional anchors are indicated in calculations.

## **2.03 FABRICATION**

- A. Fabricate metal storage shelving components to provide field-assembled units that are square and rigid, with posts plumb and true and shelves flat and free of dents or distortion. Fabricate connections to form a rigid structure, free of buckling and warping.
  1. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.
  2. Build in straps, plates, brackets, and other reinforcements as needed to support shelf loading.
  3. Cut, reinforce, drill, and tap metal fabrications to receive hardware, fasteners, and similar items.
- B. Form metal in maximum lengths to minimize joints. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.
- C. Form edges and corners free of sharp edges or rough areas. Fold back and crimp exposed edges of unsupported sheet metal to form a hem on the concealed side; ease edges of metal plate to radius of approximately 1/32 inch. Shear and punch metals cleanly and accurately. Remove burrs.
- D. Weld corners and seams continuously to develop strength, minimize distortion, and maintain the corrosion resistance of base metals. At exposed locations, finish welds and surfaces smooth and blended so surface is smooth after finishing and contour of welded surface matches that of adjacent surface. Weld before finishing components to greatest extent possible. Remove weld spatter and welding oxides from exposed surfaces before finishing.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine floors for suitable conditions where metal storage shelving will be installed.
- C. Examine walls to which metal storage shelving will be attached for properly located blocking, grounds, or other solid backing for attachment of support fasteners.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Vacuum and clean finished floor over which metal storage shelving is to be installed.

### **3.03 INSTALLATION**

- A. Install metal storage shelving level, plumb, square, rigid, true, and with shelves flat and free of dents or distortion. Make connections to form a rigid structure, free of buckling and warping.
  - 1. Install exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.
  - 2. Install braces, straps, plates, brackets, and other reinforcements as needed to support shelf loading and as required for stability.
  - 3. Anchor shelving units to floor with floor anchors through floor plate. Shim floor plate to achieve level and plumb installation.
  - 4. Connect side-to-side and back-to-back shelving units together.
  - 5. Install shelves in each shelving unit at spacing indicated on Drawings.
    - a. Four-Post Metal Storage Shelving: Install four clips, one at each post, for support of each shelf; with clips fully engaged in post perforations.

### **3.04 ERECTION TOLERANCES**

- A. Erect four-post metal storage shelving to a maximum tolerance from vertical of 1/2 inch in up to 10 feet of height, not exceeding 1 inch for heights taller than 10 feet.

### **3.05 ADJUSTING**

- A. Adjust metal storage shelving so that connectors and other components engage accurately and securely.

- B. Adjust and lubricate operable components to operate smoothly and easily, without binding or warping. Check and readjust operating hardware.
- C. Touch up marred finishes or replace metal storage shelving that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by metal storage shelving manufacturer.
- D. Replace metal storage shelving components that have been damaged beyond successful repair by finish touchup or similar minor repair procedures.

**END OF SECTION**

**SECTION 10 73 00**  
**PROTECTIVE COVERS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes the following types of extruded aluminum awnings.

**1.02 DEFINITIONS**

- A. Awning: An architectural projection that is wholly supported by the building to which it is attached.

**1.03 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.04 ACTION SUBMITTALS**

- A. Product Data.
- B. Shop Drawings: Plans and elevations for protective covers.
  - 1. Include layout, spacings of columns and supports, sizes, thicknesses, and types of aluminum framing and decking; fabrication; provisions for drainage, and fastening and anchorage details, including mechanical fasteners.
- C. Samples: For each type of finish and color selections.

**1.05 INFORMATIONAL SUBMITTALS**

- A. Warranties: Samples of special warranties.

**1.06 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For protective covers to include in maintenance manuals.

**1.07 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: A manufacturer capable of fabricating extruded aluminum protective covers meet or exceed specified performance requirements.

- B. Installer Qualifications: Manufacturer of protective covers.
- C. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of protective cover assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
  - 1. Do not revise intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If revisions are proposed, submit comprehensive explanatory data to Architect for review.
- D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

#### **1.08 PROJECT CONDITIONS**

- A. Field Measurements: Verify actual locations of structural supports for protective covers by field measurements before fabrication and indicate measurements on Shop Drawings.

#### **1.09 WARRANTY**

- A. Special Assembly Warranty: Standard form in which manufacturer agrees to repair or replace components of extruded aluminum protective covers that do not comply with requirements or that fail in materials or workmanship 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. Noise or vibration created by wind and thermal and structural movements.
    - c. Deterioration of metals and other materials beyond normal weathering.
    - d. Water penetration through decking areas or drainage components.
  - 2. Warranty Period: Five years from date of Substantial Completion.
- B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Warranty Period: 20 years from date of Substantial Completion.

## **PART 2 - MATERIALS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. General Performance: Extruded aluminum protective covers shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Structural Performance : Extruded aluminum protective covers shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.
  - 1. Dead and Live Loads: As required by local authorities having jurisdiction.
  - 2. Wind Loads: Determine lateral loads and uplift loads according to ASCE/SEI 7 using wind speed criteria indicated on Structural Drawings.

### **2.02 MANUFACTURERS**

- A. Basis of Design: Design is based on products manufactured by AVAdek. Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  - 1. Dittmer Architectural Aluminum.
  - 2. East Texas Canopy, Inc.
  - 3. Mapes Architectural Products
  - 4. Mason Corporation
  - 5. Peachtree Protective Covers.
  - 6. Superior Metal Products.

### **2.03 MATERIALS**

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
  - 1. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
  - 2. Extruded Structural Pipe and Tubes: ASTM B 429.
  - 3. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.

### **2.04 COMPONENTS**

- A. Sizes indicated on Drawings for columns, beams, and deck are minimum. Use larger or heavier component sizes where required to meet performance requirements.
- B. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
  - 1. Reinforce members as required to receive fastener threads.

2. Where exposed fasteners are required provide countersunk Phillips screw heads, finished to match framing system.
- C. Concealed Flashing: Unless otherwise indicated, provide manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.

## **2.05 FABRICATION**

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Fabricate components that, when assembled, have the following characteristics:
  1. Profiles that are sharp, straight, and free of defects or deformations.
  2. Accurately fitted joints with ends coped or mitered.
  3. Physical and thermal isolation of glazing from framing members.
  4. Accommodations for thermal and mechanical movements of framing and decking.
  5. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
  6. Provide welded end closures at the deck terminations.
- D. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

## **2.06 ALUMINUM FINISHES**

- A. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
  1. Color and Gloss: As selected by Architect from manufacturer's full range.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Erect protective covers after concrete and masonry work in vicinity is completed and cleaned.

### **3.03 INSTALLATION**

- A. General:
  - 1. Comply with manufacturer's written instructions and approved Shop Drawings.
  - 2. Do not install damaged components.
  - 3. Fit joints to produce hairline joints free of burrs and distortion.
  - 4. Rigidly secure nonmovement joints.
  - 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
  - 6. Seal joints watertight unless otherwise indicated.
- B. Install flashing as required.
- 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.

### **3.04 ERECTION TOLERANCES**

- A. Erection Tolerances: Install protective covers to comply with the following maximum tolerances:
  - 1. Plumb: 1/8 inch in 10 feet; 1/4 inch over total height.
  - 2. Level: 1/4 inch in 20 feet; 1/2 inch in 40 feet.
  - 3. Alignment:
    - a. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.

### **3.05 CLEANING AND PROTECTION**

- A. Remove temporary protective coverings and strippable films, if any, as framing and decking are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, clean finished surfaces as recommended by manufacturer of components. Maintain in a clean condition during construction.
- B. After installation, clear drainage channels of obstructions, dirt, and sealant.



- C. Replace protective cover components that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

**END OF SECTION**

**SECTION 10 75 16**  
**GROUND-SET FLAGPOLES**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes ground-set flagpoles made from aluminum.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, operating characteristics, fittings, accessories, and finishes for flagpoles.
- B. Shop Drawings: For flagpoles.
  - 1. Include plans, elevations, and attachment details. Show general arrangement, jointing, fittings, accessories, grounding, anchoring, and support.
  - 2. Include section, and details of foundation system.
- C. Samples for Verification: For each type of exposed finish, in manufacturer's standard sizes.
- D. Delegated-Design Submittal: For flagpoles.

**1.03 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: For flagpoles to include in operation and maintenance manuals.

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Spiral wrap flagpoles with heavy paper and enclose in a hard fiber tube or other protective container.

**PART 2 - PRODUCTS**

**2.01 MANUFACTURERS**

- A. Source Limitations: Obtain flagpoles as complete units, including fittings, accessories, bases, and anchorage devices, from single source from single manufacturer.

## **2.02 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Engage a qualified professional engineer, as defined in Division 01 Section "Quality Requirements," to design flagpole assemblies.
- B. Structural Performance: Flagpole assemblies, including anchorages and supports, shall withstand design loads indicated within limits and under conditions indicated.
  - 1. Wind Loads: Determine according to NAAMM FP 1001. Basic wind speed for Project location is as indicated on Structural Drawings.
  - 2. Base flagpole design on polyester flags of maximum standard size suitable for use with flagpole or flag size indicated, whichever is more stringent.

## **2.03 ALUMINUM FLAGPOLES**

- A. Aluminum Flagpoles: Cone-tapered flagpoles fabricated from seamless extruded tubing complying with ASTM B 241/B 241M, Alloy 6063, with a minimum wall thickness of 3/16 inch.
  - 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. American Flagpole.
    - b. Concord Industries, Inc.
    - c. Pole-Tech Company Inc.
    - d. U.S. Flag & Flagpole Supply, LP.
- B. Exposed Height: 25 feet unless otherwise indicated on Drawings.
- C. Construct flagpoles in one piece if possible. If more than one piece is necessary, comply with the following:
  - 1. Fabricate shop and field joints without using fasteners, screw collars, or lead caulking.
  - 2. Provide flush hairline joints using self-aligning, snug-fitting, internal sleeves.
- D. Metal Foundation Tube: Manufacturer's standard corrugated-steel foundation tube, 0.060-inch wall thickness with 3/16-inch steel bottom plate and support plate; 3/4-inch-diameter, steel ground spike; and steel centering wedges welded together. Galvanize foundation tube after assembly. Furnish loose hardwood wedges at top of foundation tube for plumbing pole.
  - 1. Flashing Collar: Same material and finish as flagpole.
- E. Sleeve for Aluminum Flagpole: Fiberglass or PVC pipe foundation sleeve, made to fit flagpole, for casting into concrete foundation.
  - 1. Flashing Collar: Same material and finish as flagpole.

- F. Cast-Metal Shoe Base: Made from aluminum with same finish and color as flagpoles for anchor-bolt mounting; furnish with anchor bolts.
  - 1. Furnish ground spike.

## **2.04 FITTINGS**

- A. Finial Ball: Flush-seam ball, sized as indicated or, if not indicated, to match flagpole-butt diameter.
  - 1. 0.063-inch spun aluminum, finished to match flagpole.
- B. Internal Halyard, Cam Cleat System: 5/16-inch-diameter, braided polypropylene halyard; cam cleat; and concealed revolving truck assembly with plastic-coated counterweight and sling. Furnish flush access door secured with cylinder lock. Finish truck assembly to match flagpole.
  - 1. Halyard Flag Snaps: Stainless-steel swivel snap hooks with neoprene or vinyl covers. Furnish two per halyard.

## **2.05 MISCELLANEOUS MATERIALS**

- A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M.
- B. Drainage Material: Crushed stone, or crushed or uncrushed gravel; coarse aggregate.
- C. Sand: ASTM C 33/C 33M, fine aggregate.
- D. Elastomeric Joint Sealant: Single-component neutral-curing silicone joint sealant complying with requirements in Division 07 Section "Joint Sealants."
- E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

## **2.06 ALUMINUM FINISHES**

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A41.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Prepare uncoated metal flagpoles that are set in foundation tubes by painting below-grade portions with a heavy coat of bituminous paint.

- B. Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete. Place and compact drainage material at excavation bottom.
- C. Provide forms where required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure and brace forms to prevent displacement during concreting.
- D. Foundation Tube: Place foundation tube, center, and brace to prevent displacement during concreting. Place concrete. Plumb and level foundation tube and allow concrete to cure.
- E. Sleeves: Locate and secure sleeves in forms by bracing to reinforcement and forms.
- F. Anchor Bolts: Locate and secure anchor bolts in forms with templates and by tying to reinforcement.
- G. Place concrete, as specified in Division 03 Section "Cast-in-Place Concrete." Compact concrete in place by using vibrators. Moist-cure exposed concrete for no fewer than seven days or use nonstaining curing compound.
- H. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to perimeter of concrete base.

### **3.02 FLAGPOLE INSTALLATION**

- A. General: Install flagpoles where indicated and according to approved Shop Drawings and manufacturer's written instructions.
- B. Foundation Tube: Place flagpole in tube, seated on bottom plate between steel centering wedges, and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch layer of elastomeric joint sealant and cover with flashing collar.
- C. Baseplate: Cast anchor bolts in concrete foundation. Install baseplate on washers placed over leveling nuts on anchor bolts and adjust until flagpole is plumb. After flagpole is plumb, tighten retaining nuts and fill space under baseplate solidly with nonshrink, nonmetallic grout. Finish exposed grout surfaces smooth and slope 45 degrees away from edges of baseplate.

**END OF SECTION**

**SECTION 11 31 00**  
**RESIDENTIAL APPLIANCES**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Refrigeration appliances.
  - 2. Microwave appliances.

**1.02 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include installation details, material descriptions, dimensions of individual components, and finishes for each appliance.
  - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
- B. Product Schedule: For appliances. Use same designations indicated on Drawings.

**1.04 INFORMATIONAL SUBMITTALS**

- A. Field quality-control reports.
- B. Sample Warranties: For manufacturers' special warranties.

**1.05 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: For each residential appliance to include in operation and maintenance manuals.

**1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Maintains, within 25 miles of Project site, a service center capable of providing training, parts, and emergency maintenance repairs.

## **1.07 WARRANTY**

- A. Special Warranties: Manufacturer agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period
  - 1. Warranty Period: Two years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

- A. Electrical Appliances: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Accessibility: Where residential appliances are indicated to comply with accessibility requirements, comply with applicable provisions in the "Texas Accessibility Standards" (TAS).

### **2.02 RESIDENTIAL APPLIANCES, GENERAL**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. General Electric Company (GE Appliances).
  - 2. KitchenAid; a division of Whirlpool Corporation.
  - 3. Maytag; a division of Whirlpool Corporation.
  - 4. Sears Brands LLC (Kenmore).
  - 5. Whirlpool Corporation.

### **2.03 FULL-HEIGHT REFRIGERATOR/FREEZERS**

- A. Refrigerator/Freezer: Two-door refrigerator/freezer with freezer on top complying with AHAM HRF-1.
  - 1. Type: Freestanding.
  - 2. General Features:
    - a. Door Configuration: Overlay.
    - b. Dispenser in door for ice and cold water with dispenser lock.
    - c. Built-in water-filtration system.
    - d. Dual refrigeration systems.
    - e. Separate temperature controls for each compartment.
  - 3. Refrigerator Features:
    - a. Interior light in refrigeration compartment.

- b. Compartment Storage: vegetable crisper and meat compartment.
  - c. Door Storage: Modular compartments.
  - d. Temperature-controlled meat/deli bin.
4. Freezer Features: One freezer compartment(s) with door(s).
- a. Automatic defrost.
  - b. Interior light in freezer compartment.
  - c. Automatic icemaker and storage bin.
5. Front Panel(s): Manufacturer's standard.
- a. Panel Color: Stainless steel.
6. Appliance Color/Finish: Stainless steel.

## **2.04 MICROWAVE APPLIANCES**

### **A. Microwave Oven:**

- 1. Quantity: Two.
- 2. Mounting: Countertop.
- 3. Type: Conventional.
- 4. Dimensions:
  - a. Width: 24 inches.
  - b. Depth: 19-1/2 inches.
  - c. Height: 14 inches.
- 5. Capacity: 1.5 cu. ft..
- 6. Oven Door: Door with observation window and pull handle and pushbutton latch release.
- 7. Exhaust Fan: Variable-speed fan, nonvented, recirculating type with charcoal filter and with manufacturer's standard 300 cfm capacity.
- 8. Microwave Power Rating: 1000 W.
- 9. Electric Power Supply: 120 V, 60 Hz, 1 phase, 15 A.
- 10. Controls: Digital panel controls and timer display.
- 11. Other Features: Turntable, temperature probe, and lock-out feature.
- 12. Material: Stainless steel.

## **2.05 GENERAL FINISH REQUIREMENTS**

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.



## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of residential appliances.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. Install appliances according to manufacturer's written instructions.
- B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.
- C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.

### **3.03 FIELD QUALITY CONTROL**

- A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
  - 1. Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.
  - 2. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.
  - 3. Operational Test: After installation, start units to confirm proper operation.
  - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and components.
- B. An appliance will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

**3.04 DEMONSTRATION**

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain residential appliances.

**END OF SECTION**

**SECTION 12 21 13**  
**HORIZONTAL LOUVER BLINDS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Horizontal louver blinds with aluminum slats.
- B. Related Sections include:
  - 1. Division 06 Section "Miscellaneous Rough Carpentry" for wood blocking and grounds for mounting horizontal louver blinds and accessories.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, 12 inches long.
- C. Samples for Initial Selection: For each type and color of horizontal louver blind.
  - 1. Include Samples of accessories involving color selection.
  - 2. Horizontal Louver Blind: Full-size unit, not less than 16 inches wide by 24 inches long.
  - 3. Valance: Full-size unit, not less than 12 inches wide.
- D. Product Schedule: For horizontal louver blinds. Use same designations indicated on Drawings.

**1.03 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For horizontal louver blinds to include in maintenance manuals.

**1.04 QUALITY ASSURANCE**

- A. Installer Qualifications: Fabricator of products.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver horizontal louver blinds in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

### **1.06 FIELD CONDITIONS**

- A. Environmental Limitations: Do not install horizontal louver blinds until construction and wet-work and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where horizontal louver blinds are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Source Limitations: Obtain horizontal louver blinds from single source from single manufacturer.

### **2.02 HORIZONTAL LOUVER BLINDS, ALUMINUM SLATS**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  1. Hunter Douglas Contract.
  2. Levolor.
  3. Springs Window Fashions; SWFcontract.
- B. Slats: Aluminum; alloy and temper recommended by producer for type of use and finish indicated; with crowned profile and radius corners.

1. Width: 1/2 to 5/8 inch.
  2. Thickness: Manufacturer's standard.
  3. Spacing: Manufacturer's standard.
  4. Finish: Ionized antistatic, dust-repellent, baked polyester finish.
- C. Headrail: Formed steel or extruded aluminum; long edges returned or rolled. Headrails fully enclose operating mechanisms on three sides.
1. Capacity: One blind(s) per headrail unless otherwise indicated.
  2. Ends: Manufacturer's standard.
  3. Manual Lift Mechanism:
    - a. Lift-Cord Lock: Variable; stops lift cord at user-selected position within blind full operating range.
    - b. Operator: Extension of lift cord(s) through lift-cord lock mechanism to form cord pull.
  4. Manual Tilt Mechanism: Enclosed worm-gear mechanism and linkage rod that adjusts ladders.
    - a. Tilt: Full.
    - b. Operator: Clear-plastic wand.
    - c. Over-Rotation Protection: Manufacturer's detachable operator or slip clutch to prevent over rotation of gear.
  5. Manual Lift-Operator and Tilt-Operator Lengths: Manufacturer's standard.
  6. Manual Lift-Operator and Tilt-Operator Locations: Manufacturer's standard unless otherwise indicated.
- D. Bottom Rail: Formed-steel or extruded-aluminum tube that secures and protects ends of ladders and lift cords and has plastic- or metal-capped ends.
1. Type: Manufacturer's standard.
- E. Lift Cords: Manufacturer's standard braided cord.
- F. Ladders: Evenly spaced across headrail at spacing that prevents long-term slat sag.
- G. Valance: Manufacturer's standard.
- H. Mounting Brackets: With spacers and shims required for blind placement and alignment indicated.
1. Type: As indicated.
  2. Intermediate Support: Provide intermediate support brackets to produce support spacing recommended by blind manufacturer for weight and size of blind.
- I. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard.

- J. Colors, Textures, Patterns, and Gloss:
1. Slats: As selected by Architect from manufacturer's standard color selection.
  2. Components: Provide rails, cords, ladders, and materials exposed to view matching or coordinating with slat color unless otherwise indicated.

### **2.03 HORIZONTAL LOUVER BLIND FABRICATION**

- A. Product Safety Standard: Fabricate horizontal louver blinds to comply with WCMA A 100.1 including requirements for corded, flexible, looped devices; lead content of components; and warning labels.
- B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:
1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which blind is installed less 1/4 inch per side or 1/2 inch total, plus or minus 1/8 inch. Length equal to head-to-sill dimension of opening in which blind is installed less 1/4 inch, plus or minus 1/8 inch.
  2. Outside of Jamb Installation: Width and length as indicated, with terminations between blinds of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.
- C. Concealed Components: Noncorrodible or corrosion-resistant-coated materials.
1. Lift-and-Tilt Mechanisms: With permanently lubricated moving parts.
- D. Mounting and Intermediate Brackets: Designed for removal and reinstallation of blind without damaging blind and adjacent surfaces, for supporting blind components, and for bracket positions and blind placement indicated.
- E. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to brackets and adjoining construction; type designed for securing to supporting substrate; and supporting blinds and accessories under conditions of normal use.
- F. Color-Coated Finish:
1. Metal: For components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. Install horizontal louver blinds level and plumb, aligned and centered on openings, and aligned with adjacent units according to manufacturer's written instructions.
  - 1. Locate so exterior slat edges are not closer than 1 inch from interior faces of glass and not closer than 1/2 inch from interior faces of glazing frames through full operating ranges of blinds.
  - 2. Install mounting and intermediate brackets to prevent deflection of headrails.
  - 3. Install with clearances that prevent interference with adjacent blinds, adjacent construction, and operating hardware of glazed openings, other window treatments, and similar building components and furnishings.

### **3.03 ADJUSTING**

- A. Adjust horizontal louver blinds to operate free of binding or malfunction through full operating ranges.

### **3.04 CLEANING AND PROTECTION**

- A. Clean horizontal louver blind surfaces after installation according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions in a manner acceptable to manufacturer and Installer that ensures that horizontal louver blinds are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged horizontal louver blinds that cannot be repaired in a manner approved by Architect before time of Substantial Completion.

### **3.05 SCHEDULE**

- A. Provide louver blinds at all windows in offices on the exterior wall. No blinds required in the Training Room.

**END OF SECTION**



**SECTION 12 24 13**  
**ROLLER WINDOW SHADES**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes:
  - 1. Manually operated single roller shades.

**1.02 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.
- B. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.
- C. Samples: For each exposed product and for each color and texture specified.
- D. Roller-Shade Schedule: Use same designations indicated on Drawings.

**1.04 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: For roller shades to include in maintenance manuals.

**1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: Fabricator of products.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

#### **1.07 FIELD CONDITIONS**

- A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

### **PART 2 - PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  1. Draper Inc.
  2. Hunter Douglas Contract.
  3. MechoShade Systems, Inc.
- B. Source Limitations: Obtain roller shades from single source from single manufacturer.

#### **2.02 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS**

- A. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.

1. Bead Chains: Nickel-plated metal.
  - a. Loop Length: Full length of roller shade.
  - b. Limit Stops: Provide upper and lower ball stops.
  - c. Chain-Retainer Type: Chain tensioner, sill mounted.
  
- B. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
  1. Roller Drive-End Location: Right side of interior face of shade.
  2. Direction of Shadeband Roll: Regular, from back (exterior face) of roller.
  3. Shadeband-to-Roller Attachment: Manufacturer's standard method.
  
- C. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.
  
- D. Shadebands:
  1. Shadeband Material: Light-blocking fabric unless indicated otherwise.
  2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
    - a. Type: Enclosed in sealed pocket of shadeband material.
    - b. Color and Finish: As selected by Architect from manufacturer's full range.
  
- E. Installation Accessories:
  1. Exposed Headbox: Rectangular, extruded-aluminum enclosure including front fascia, top and back covers, endcaps, and removable bottom closure.
    - a. Height: Manufacturer's standard height required to enclose roller and shadeband assembly when shade is fully open, but not less than 3 inches.
    - b. Endcap Covers: To cover exposed endcaps.
  
  2. Installation Accessories Color and Finish: As selected from manufacturer's full range.

### **2.03 SHADEBAND MATERIALS**

- A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701. Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  
- B. Light-Filtering Fabric: Woven fabric, stain and fade resistant.
  1. Source: Roller-shade manufacturer.

2. Type: Vinyl-coated polyester.
3. Roll Width: As indicated on Drawings.
4. Thickness: 30 mils.
5. Orientation on Shadeband: Up the bolt.
6. Openness Factor: 5 percent maximum.
7. Color: As selected by Architect from manufacturer's full range.

C. Light-Blocking Fabric: Opaque fabric, stain and fade resistant.

1. Source: Roller-shade manufacturer.
2. Type: Vinyl-coated polyester.
3. Roll Width: As indicated on Drawings.
4. Thickness: 14 mils.
5. Orientation on Shadeband: Up the bolt.
6. Color: As selected by Architect from manufacturer's full range.

## 2.04 ROLLER-SHADE FABRICATION

- A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.
- B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:
1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch per side or 1/2-inch total, plus or minus 1/8 inch. Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch, plus or minus 1/8 inch.
  2. Outside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.
- C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, locations of connections to building electrical system, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 ROLLER SHADE INSTALLATION**

- A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.
  - 1. Opaque Shadebands: Located so shadeband is not closer than 2 inches to interior face of glass. Allow clearances for window operation hardware.
- B. Roller Shade Locations: Provide light filtering fabric at the training room.

**3.03 ADJUSTING**

- A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

**3.04 CLEANING AND PROTECTION**

- A. Clean roller shade surfaces, after installation, according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

**END OF SECTION**

**SECTION 12 36 23.13**  
**PLASTIC-LAMINATE-CLAD COUNTERTOPS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes plastic-laminate countertops.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product, including panel products and high-pressure decorative laminate.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
- C. Samples for Initial Selection: Plastic laminates.
- D. Samples for Verification: Plastic laminates, 8 by 10 inches, for each type, color, pattern, and surface finish, with one sample applied to core material.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.

**1.04 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Installer Qualifications: Fabricator of products.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Do not deliver countertops until painting and similar operations that could damage countertops have been completed in installation areas. If countertops must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

## **1.06 FIELD CONDITIONS**

- A. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 43 and 70 percent during the remainder of the construction period.
- B. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Established Dimensions: Where countertops are indicated to fit to other construction, establish dimensions for areas where countertops are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

## **PART 2 - PRODUCTS**

### **2.01 PLASTIC-LAMINATE COUNTERTOPS**

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades indicated for construction, installation, and other requirements.
  - 1. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.
- B. Grade: Premium.
- C. High-Pressure Decorative Laminate: NEMA LD 3, Grade HGS.
  - 1. Manufacturers: Basis of Design is products Indicated on Drawings. 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. Formica Corporation.
    - b. Nevamar; a Panolam Industries International, Inc. brand.
    - c. Pionite; a Panolam Industries International, Inc. brand.
    - d. Wilsonart International Holdings.
- D. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces as indicated by manufacturer's designations or if not indicated as selected by Architect from manufacturer's full range of solid colors, matte finish.
- E. Edge Treatment: 3-mm PVC edging.

- F. Core Material: Medium-density fiberboard.
- G. Core Thickness: 3/4 inch.
  - 1. Build up countertop thickness to 1-1/2 inches at front, back, and ends with additional layers of core material laminated to top.
- H. Paper Backing: Provide paper backing on underside of countertop substrate.

## **2.02 WOOD MATERIALS**

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard unless otherwise indicated.
  - 1. Wood Moisture Content: 8 to 13 percent.
- B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
  - 1. Medium-Density Fiberboard: ANSI A208.2, Grade 130, made with binder containing no urea formaldehyde.
  - 2. Particleboard: Not permitted.
  - 3. Softwood Plywood: DOC PS 1.

## **2.03 FABRICATION**

- A. Fabricate countertops to dimensions, profiles, and details indicated. Provide front and end overhang of 1 inch over base cabinets.
- B. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
  - 1. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.
- C. Shop cut openings to maximum extent possible to receive 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.
  - 1. Seal edges of openings in countertops with a coat of varnish.



## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Before installation, condition countertops to average prevailing humidity conditions in installation areas.
- B. Before installing countertops, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

### **3.02 INSTALLATION**

- A. Grade: Install countertops to comply with same grade as item to be installed.
- B. Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.
  - 1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items.
  - 2. Seal edges of cutouts by saturating with varnish.
- C. Field Jointing: Where possible, make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.
  - 1. Secure field joints in plastic-laminate countertops with concealed clamping devices located within 6 inches of front and back edges and at intervals not exceeding 24 inches. Tighten according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.
- D. Install countertops level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
- E. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- F. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
  - 1. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
  - 2. Secure backsplashes to tops with concealed metal brackets at 16 inches o.c. and to walls with adhesive.
  - 3. Seal junctures of tops, splashes, and walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

**3.03 ADJUSTING AND CLEANING**

- A. Repair damaged and defective countertops, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean countertops on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

**END OF SECTION**

**SECTION 12 36 61.19**  
**QUARTZ AGGLOMERATE COUNTERTOPS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes quartz agglomerate countertops.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For countertop materials.
- B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, details of deal tray, and cutouts for plumbing fixtures.
- C. Samples: For each type of material exposed to view.

**PART 2 - PRODUCTS**

**2.01 QUARTZ AGGLOMERATE COUNTERTOP MATERIALS**

- A. Quartz Agglomerate: Solid sheets consisting of quartz aggregates bound together with a matrix of filled plastic resin and complying with ICPA SS-1, except for composition.
  - 1. Basis of Design: Design is based on products scheduled on Drawings. Subject to compliance with requirements, provide named products or comparable products approved by Architect by one of the following:
    - a. Cosentino USA.
    - b. E. I. du Pont de Nemours and Company.
    - c. LG Chemical, Ltd.
    - d. Wilsonart LLC.
  - 2. Colors and Patterns: As indicated by manufacturer's designations or if not indicated as selected by Architect from manufacturer's full range.
- B. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

## **2.02 COUNTERTOP FABRICATION**

- A. Fabricate countertops according to quartz agglomerate manufacturer's written instructions and the AWI/AWMAC/WI's "Architectural Woodwork Standards."
  - 1. Grade: Premium.
- B. Configuration: As indicated on Drawings.
- C. Countertops: 3/4-inch- thick, quartz agglomerate with front edge built up with same material.
- D. Backsplashes: 1/2-inch- thick, quartz agglomerate.
- E. Joints: Fabricate countertops in sections for joining in field, with joints at locations indicated.
- F. Cutouts and Holes:
  - 1. Undercounter Plumbing Fixtures: Make cutouts for fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.
  - 2. Counter-Mounted Recessed Deal Trays: Prepare countertops in shop for field cutting openings for counter-mounted recessed deal trays. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.

## **2.03 ACCESSORIES**

- A. Recessed Deal Trays: Formed from stainless steel; fabricated in curved shape with exposed flanges for recessed installation into horizontal surface.
  - 1. Clear Opening Size: 12 inches wide by 8 inches deep by 1-1/2 inches high.

## **2.04 INSTALLATION MATERIALS**

- A. Adhesive: Product recommended by quartz agglomerate manufacturer.
- B. Sealant for Countertops: Comply with applicable requirements in Division 07 Section "Joint Sealants."

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.

- B. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.
- C. Install backsplashes and end splashes by adhering to wall and countertops with adhesive.
- D. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
- E. Apply sealant to gaps at walls; comply with Division 07 Section "Joint Sealants."

**END OF SECTION**

**SECTION 31 31 16**  
**TERMITE CONTROL**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes soil treatment with termiticide.

**1.02 PREINSTALLATION CONFERENCE**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated. Include the EPA-Registered Label for termiticide products.

**1.04 INFORMATIONAL SUBMITTALS**

- A. Product certificates.
- B. Soil Treatment Application Report: Include the following:
  - 1. Date and time of application.
  - 1. Moisture content of soil before application.
  - 2. Termiticide brand name and manufacturer.
  - 3. Quantity of undiluted termiticide used.
  - 4. Dilutions, methods, volumes used, and rates of application.
  - 5. Areas of application.
  - 6. Water source for application.
- C. Warranties: Sample of special warranties.

**1.05 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 by manufacturer to install manufacturer's products.
- B. Regulatory Requirements: Formulate and apply termiticides and termiticide devices according to the EPA-Registered Label.

## **1.06 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.
- B. Coordinate soil treatment application with excavating, filling, grading, and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs before construction.

## **1.07 WARRANTY**

- A. Soil Treatment 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.

## **1.08 MAINTENANCE SERVICE**

- A. Continuing Service: Beginning at Substantial Completion, provide 12 months' continuing service including monitoring, inspection, and re-treatment for occurrences of termite activity. Provide a standard continuing service agreement. State services, obligations, conditions, terms for agreement period, and terms for future renewal options.

## **PART 2 - PRODUCTS**

### **2.01 SOIL TREATMENT**

- A. Termiticide: Provide an EPA-Registered termiticide, complying with requirements of authorities having jurisdiction, in an aqueous solution 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.
  - 1. 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. BASF Corporation, Agricultural Products.
    - b. Bayer Environmental Science.
    - c. FMC Corporation, Agricultural Products Group.
    - d. Syngenta.

2. Service Life of Treatment: Soil treatment termiticide that is effective for not less than five years against infestation of subterranean termites.

### **PART 3 - EXECUTION**

#### **3.01 APPLICATION, GENERAL**

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

#### **3.02 APPLYING SOIL TREATMENT**

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of soil per termiticide label requirements, interfaces with earthwork, slab and foundation work, landscaping, utility installation, and other conditions affecting performance of termite control.
- B. Proceed with application only after unsatisfactory conditions have been corrected.
- C. 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.
  1. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.
- D. 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; along both sides of interior partition walls; around plumbing pipes and electric conduit penetrating the slab; around interior column footers, piers, and chimney bases; and along the entire outside perimeter, from grade to bottom of footing. Avoid soil washout around footings.
  3. Masonry: Treat voids.
  4. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.



- E. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.
- F. 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.
- G. Post warning signs in areas of application.
- H. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

**END OF SECTION**

**SECTION 32 31 19**  
**DECORATIVE METAL FENCES AND GATES**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes steel gates with exposed fastener, lap-seam metal panels for dumpster enclosure.
- B. Related sections include Division 09 Section "Exterior Painting" for field painting of dumpster gate frame.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings: For fencing and gates. Include plans, elevations, sections, gate locations, post spacing and attachment details.
- C. Samples: for Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

**1.03 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For metal panels to include in maintenance manuals.

**1.04 QUALITY ASSURANCE**

- A. Installer Qualifications: Fabricator of products.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
  - 1. Include 6-foot length of gate panel complying with requirements.
  - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal panels during installation.

## **PART 2 - PRODUCTS**

### **2.01 STEEL SWING GATES AND POSTS FOR DUMPSTER ENCLOSURE**

- A. Gate Configuration: Double leaf.
- B. Gate Frame Height and Width: As indicated on Drawings.
- C. Galvanized-Steel Frames and Bracing: Fabricate members from square tubes 2-1/2 by 2-1/2 inches formed from 0.108-inch nominal-thickness, metallic-coated steel sheet or formed from 0.105-inch nominal-thickness steel sheet and hot-dip galvanized after fabrication.
- D. Frame Corner Construction: Welded.
- E. Additional Rails: Provide as indicated.
- F. Swing Gate Posts: 4 by 4 inches with 3/16 inch wall thickness.
- G. Post Caps: Formed from sheet steel.
- H. Infill: Exposed fastener, lap-seam metal panel formed with raised, trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced between major ribs.
  - 1. Basis of Design: Design is based on Berridge Manufacturing R-Panel. Subject to compliance with requirements, provide named product or comparable product approved by Architect.
  - 2. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 coating designation;

structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

- a. Nominal Thickness: 0.028 inch.
  - b. Exterior Finish: Two-coat fluoropolymer.
  - c. Color: As selected by Architect from manufacturer's full range.
- I. Hardware: Latches permitting operation from both sides of gate, hinges, and keepers for each gate leaf more than 5 feet wide. Provide center gate stops and cane bolts for pairs of gates. Provide hasp for locking with padlock.
- J. Hinges: BHMA A156.1, Grade 1, suitable for exterior use.
1. Function: 39 - Full surface, triple weight, antifriction bearing.
  2. Material: Wrought steel, forged steel, cast steel, or malleable iron; galvanized.
- K. Cane Bolts: Provide for inactive leaf of pairs of gates. Fabricated from 3/4-inch- diameter, round steel bars, hot-dip galvanized after fabrication. Finish to match gates. Provide galvanized-steel pipe strikes to receive cane bolts in both open and closed positions.
- L. Finish exposed welds to comply with NOMMA Guideline 1, Finish #4 - good-quality, uniform undressed weld with minimal splatter.
- M. Steel Finish for Gate Frame and Posts: Primed.

## **2.02 STEEL AND IRON**

- A. Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Tubing: ASTM A 500/A 500M, cold-formed steel tubing.

## **2.03 MISCELLANEOUS MATERIALS**

- A. Concrete: Normal-weight, air-entrained, ready-mix concrete complying with requirements in Division 03 Section "Cast-in-Place Concrete" with a minimum 28-day compressive strength of 3000 psi, 3-inch slump, and 1-inch maximum aggregate size or dry, packaged, normal-weight concrete mix complying with ASTM C 387/C 387M mixed with potable water according to manufacturer's written instructions.

## **2.04 STEEL FINISHES**

- A. Shop Primers for Steel Gate Frame and Posts: Provide primers that comply with Division 09 Section "Exterior Painting."
- B. Steel Panels:

1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
3. 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 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.

## **2.05 MISCELLANEOUS MATERIALS**

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Nonshrink Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M and specifically recommended by manufacturer for exterior applications.

## **PART 3 - EXECUTION**

### **3.01 GATE INSTALLATION**

- A. Install gate level, plumb, and secure for full opening without interference. 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.

### **3.02 METAL PANEL INSTALLATION**

- A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
  1. Shim or otherwise plumb substrates receiving metal panels.
  2. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
- B. Fasteners for Steel Panels: Use stainless-steel fasteners.
- C. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Lap ribbed or fluted sheets one full rib. Apply panels and associated items true to line for neat and weathertight enclosure.
2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.

### **3.03 ADJUSTING**

- A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware and other moving parts.

### **3.04 CLEANING AND PROTECTION**

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
- B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

**END OF SECTION**

**SECTION 32 80 00**

**LANDSCAPE IRRIGATION SYSTEM**

**PART 1 - GENERAL**

1.01 SUMMARY

- A. Related Documents: Drawings and general provisions of Contract, including General and Supplementary Conditions.

1.02 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and install complete irrigation system in the locations as shown on the Drawings and as specified herein.
- B. The Contractor's attention is called to the fact that all PVC piping, fittings, drip tubing and accessories are not shown on the Drawings. Some piping is simply shown in schematic form. The Contractor shall furnish and install all piping indicated or required for the proper operation of the irrigation system.

1.03 RELATED WORK

- A. The following sections contain requirements that relate to this section:

- 1. Section 02900 - Landscaping

1.04 LICENSED IRRIGATOR

Installation of the irrigation system shall be under the supervision of a superintendent or foreman currently registered as a Licensed Irrigator by the State of Texas.

1.05 STANDARDS

ASTM D1785 (ANSI B72.7): Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.

ASTM D2241 (ANSI B72.2): Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR).

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ASTM D2466: Standard Specification for Poly (Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40.

ASTM D2564 (ANSI B72.16): Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Pipe and Fittings.

ASTM D2855 (ANSI K65.55): Standard Recommended Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.

#### 1.06 EQUAL MATERIALS

- A. It is not the intent of these specifications to limit materials to the product of any particular manufacturer. Where definite materials, equipment and/or fixtures have been specified, it has been done to set a definite standard and a reference for comparison as to quality, application, physical conformity, and other characteristics. It is not the intention of the Owner or the Consultant to discriminate against or prevent any dealer, jobber or manufacturer from furnishing materials, equipment, and/or fixtures which meet or exceed the characteristics of the specified items. Substitution of materials shall not be made without prior written approval from the Owner and the Consultant.
- B. Design criteria and water pressure must be carefully considered when selecting equipment. Only equipment that performs as specified will be considered.

#### 1.07 LOCATION OF AND DAMAGE TO EXISTING UTILITIES

The Contractor is responsible for locating underground obstacles. Exercise caution to prevent damage to existing facilities during the progress of the work, taking care to locate same, where possible, in advance of the actual work. The Owner's representative will render all assistance possible to the Contractor in determining the location of existing utilities by making available such maps, records and other information as may be accessible to him, when requested to do so, but the accuracy of such information will not be guaranteed. The Contractor shall be responsible for repairs resulting from damage to existing utilities resulting from his operations. Should the Contractor, in the layout of work, encounter any pipe, underground utility, or structure, the location of which has not been furnished to him by the Owner, he shall bring such conditions to the attention of the Owner's representative for his determination of the method to be used to remove or bypass such obstructions.

#### 1.08 WATER SUPPLY

Make connections to the existing water line at the location shown on the civil

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engineer's plans. Taps and water meters are to be furnished and installed at the expense of the Contractor. The pipe from the meter to the backflow preventer shall be of the size specified on the irrigation plans, and be the same type as the service line to the meter. All connections shall be made horizontally and at right angles.

#### 1.09 WORKMANSHIP

Install equipment in accordance with the recommendations of the manufacturer and the best standard practice for this type of work. Care must be taken to keep the inside of the pipes clean and free of dirt, rock, cutting, etc. Flush all systems clean prior to installing sprinkler heads and drip lines.

#### 1.10 CODES AND PERMITS

Install all work according to applicable codes and ordinances of TCEQ, local jurisdictions and the National Electrical Code. Obtain and pay for all required permits.

#### 1.11 WEATHER PROTECTION

Protect and maintain all work, materials and fixtures from weather damage. All new work likely to be damaged shall be covered or otherwise protected.

#### 1.12 SITE CONDITIONS

Before ordering materials or beginning work, verify dimensions of existing and new work. Any differences found shall be submitted to the Owner's representative for consideration before proceeding with work. No extra compensation will be allowed because of differences between actual dimensions and measurements indicated on the plans. Plans are diagrammatic and approximate.

#### 1.13 PROTECTION AND SAFETY

- A. Send proper notices, make all necessary arrangements and perform other services required for the care, protection and maintenance of public utilities, and services, including fire plugs, telephone and telegraph poles and wires, and all other items of this nature on or about the site, assuming all responsibility and paying all costs for which the Owner may be liable.
- B. Construct and maintain necessary temporary drainage and provide pumping, as required, to keep excavations free of water.

- C. Provide all shoring, bracing and sheeting as required by OSHA Regulations and for the proper execution of the work; and have same removed from the site when the work is completed.
- D. Fires are not permitted.
- E. All work shall be performed in accordance with the national "Occupational Safety And Health Standards" (OSHA).

#### 1.14 SUBMITTALS

Provide copies of complete brochures describing equipment and materials, including names of manufacturer's catalog numbers, trade names, and instructions for setting, connecting and operation, and technical data and any special information requested. An approved copy of submittals shall be in the file of the Contractor's representative at the project site.

#### 1.15 RECORD PRINTS

- A. Provide and keep a complete up-to-date Record Set of prints which shall be corrected daily and show every change, in red ink, from the original plans and specifications and the exact locations, sizes and kinds of equipment. Prints for this purpose may be obtained from the Owner's representative at cost. This set of drawings shall be kept on the site and shall be used only as a record set.
- B. These drawings shall also serve as work progress sheets and shall be the basis for measurement and payment for work completed. Make neat and legible annotations thereon daily as the work proceeds, showing the work as actually installed. These plans shall be available at all times for inspection and shall be kept in a location designated by the Consultant.
- C. Before the date of the final inspection, transfer all information from the record prints to an as-built plan, procured from the Consultant. All work shall be neat, in ink, and subject to the approval of the Consultant.
- D. Dimension from two (2) permanent points of reference, building corners, sidewalks, or road intersections, etc., the location of the following items:
  - 1. Connection to existing water lines.
  - 2. Connection to existing electrical power.
  - 3. Gate valves.
  - 4. Routing of irrigation pressure lines (dimension maximum 100' along routing).
  - 5. Remote control valves.

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6. Routing of control tubing.
7. Quick coupling valves.
8. Routing of irrigation lateral lines (with a change of two (2) feet each way).
9. Other related equipment as directed by the Owner's representative.

- E. Prior to the date of the final inspection, deliver the corrected and completed as-built plan to the Consultant for approval. Delivery of the as-built plans will not relieve the responsibility of furnishing required information that may be omitted from the prints.

#### 1.16 CONTROLLER CHARTS

- A. Record prints shall be approved by the Consultant before controller charts are prepared.
- B. Provide one controller chart for each automatic controller.
- C. The chart shall show the area controlled by the automatic controller and shall be the maximum size which the controller door will allow.
- D. The chart is to be a reduced plan of the actual approved in-place system.
- E. The chart shall be a color print with different colors used to indicate the area of coverage for each zone, along with recommended summer run times for each zone.
- F. When completed and approved, the chart shall be laminated and affixed to inside of controller door.
- G. These charts shall be completed and approved by the Consultant prior to final inspection of the irrigation system.

#### 1.17 IRRIGATION CONTRACTOR'S RESPONSIBILITY

- A. Prior to submittal of the bid, the Contractor shall acquaint himself with all matters and conditions concerning the site and existing conditions.
- B. Coordinate work with the other trades so that all phases of the work may be properly coordinated without delays or damage to any parts of the work.
- C. The Contractor shall be responsible for all sleeves and chases under paving, through walls, etc., unless otherwise noted on plans.

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#### 1.18 CHANGES IN THE WORK

- A. The Owner may, without invalidating the contract, order additional work or alterations to the contract.
- B. Any changes shall be requested in writing and the contract sum shall be adjusted according to the unit cost bid submitted by the Contractor. Any extension of time due to additions in work shall be adjusted at the time of the change order.
- C. Minor changes, such as head locations and controller locations, which do not involve extra cost and are consistent with the purpose of the work may be ordered by the Owner's representative and no claim for an addition to the contract sum or time schedule will be considered.

#### 1.19 FINAL INSPECTION

A qualified person duly authorized in writing to represent the Irrigation Contractor shall be present at the final inspection to demonstrate the systems and prove the performance of the equipment. Prior to this inspection, all work under this division shall have been completed, tested, balanced, and adjusted and in final operating condition.

#### 1.20 GUARANTEE

- A. Guarantee the satisfactory operation of the entire system, to the extent possible under the scope of the work included in this contract. The entire system shall be guaranteed to be complete and work properly for a period of one year from date of final acceptance. Repair any defects or replace any defective parts found or occurring within that year, free of expense to the Owner.
- B. Include a copy of the guarantee form in the Operation and Maintenance Manual.

#### 1.21 MISCELLANEOUS SERVICES OF IRRIGATION CONTRACTOR

- A. Train at least two (2) of the Owner's employees in the operation and maintenance of the system. This shall include the operation of the controllers and valves, how to most effectively use the system, and maintenance on all equipment including the removal and replacement of valve and controller components.
- B. Provide two (2) quick coupling valve keys and two (2) sets of automatic controller keys for each controller. This equipment shall be turned over to the Owner upon final acceptance of the work by the Owner.

- C. Provide a watering program to the Owner showing the scheduling or sequencing of the valves, including which valves may be run simultaneously, and a desirable timing program for each zone representing the maximum seasonal demand and suggested monthly seasonal percentage adjustments. The controllers shall be scheduled to prevent an excessive amount of head loss in the system. The program shall include suggested operating time for new planting and established growth.
- D. Operation and Maintenance Manuals - Prepare and deliver to the Owner and Consultant, within ten calendar days prior to completion of construction, the following information:
  - 1. Index sheet stating Contractor's address and telephone number, with list of equipment including name and addresses of local manufacturer's representative.
  - 2. A suggested seasonal or monthly watering schedule based on current evapotranspiration data for the geographic region and minimum water requirements for the plant material in each zone based on the soil type and plant material where the system is installed.
  - 3. Catalog and parts sheets on each product and equipment type installed under this contract.
  - 4. Guarantee statement.
  - 5. Complete operating and maintenance instruction on all major equipment.

#### 1.22 SITE OR FIELD VISITS BY THE CONSULTANT

- A. The Consultant will visit the site once to examine materials for type, size and character specified. The Consultant will also visit the site once to examine the installation and operation of the system.
- B. Should additional trips be required due to rejection of materials or improper or inadequate completion of the work, the costs of additional trips will be paid for by the Contractor. Such costs will include the Consultant's time, travel and other miscellaneous related expenses.

## **PART 2 - MATERIALS**

### 2.01 GENERAL

All materials and accessories shall be of new and unused material. Any section of pipe found to be defective before or after installation shall be replaced with new pipe. All new irrigation equipment shall be essentially the standard product of the manufacturer. All new equipment furnished shall have in-service performance records sufficient to verify published capabilities.

### 2.02 PIPE AND FITTINGS

#### A. PVC Pressure Main Line and Fittings:

1. Pressure main line piping shall be SDR 21 (200 PSI) PVC. Main line piping less than three (3) inches in diameter shall have solvent welded joints. Main line piping greater than three (3) inches in diameter shall be JM Ring-Tite gasketed bell joint pipe, or approved equal.
2. Pipe shall be made from NSF approved Type I, Grade I PVC compound conforming to ASTM resin specification D1785. All pipe must meet the requirements of Federal Specification S-21-70.
3. PVC solvent-weld fittings shall be Schedule 40, 1-2, II-1 NSF approved conforming the ASTM test procedure D2466.
4. Solvent cement and primer for PVC solvent-weld pipe and fittings shall be of type and installation methods prescribed by the manufacturer.
5. All PVC pipe must bear the following markings:
  - a. Manufacturer's name.
  - b. Nominal pipe size.
  - c. Schedule or class.
  - d. Pressure rating in PSI.
  - e. NSF (National Sanitation Foundation) approval.
  - f. Date of extrusion.
6. All fittings shall bear the manufacturer's name of trademark, material designation, size applicable IPS schedule and NSF seal of approval.

B. PVC Non-Pressure Lateral Line Piping:

1. Non-Pressure buried lateral line piping shall be SDR 21 (200 PSI) PVC with solvent-weld joints.
2. Pipe shall be made from NSF approved, Type I, Grade II PVC compound conforming to ASTM resin specification D1785. All pipe must meet the requirements of Federal Specification PS-21-70 with an appropriate standard dimension ratio.
3. Except as noted in paragraphs above, pipe and fittings for PVC non-pressure lateral line piping will be the same as for solvent-weld pressure main line pipe and fittings as set forth in "PVC Pressure Main Line Pipe and Fittings" above.

2.03 AUTOMATIC CONTROLLERS

- A. Automatic controllers shall be of type and size shown on the plans.
- B. Final location of automatic controllers shall be approved by the Owner's Representative prior to installation.
- C. The 120 volt electrical power for the automatic controllers shall be provided by the Contractor.
- D. Controller shall be housed in a locking weatherproof case if located outdoors.

2.04 GATE VALVES

Gate valves shall have bell or spigot ends, flanges or screw joints as required for the piping in which they are installed. All gate valves shall be manufactured of brass conforming to the AWWA Standard C-500, or to Federal Specification WW-V-58, Class B. Gate Valves shall be designed for a minimum water working pressure of 150 psi. Gate valves shall have a clear waterway equal to the full nominal diameter of the valve and shall be opened by turning counterclockwise.

2.05 REMOTE CONTROL VALVES

The remote control valves shall be of the type shown on the drawings, and shall be electrically operated, normally closed diaphragm type valves. Valves shall be slow opening and closing. Valves shall have a manual flow control and manual bleed plug.

## 2.06 QUICK COUPLING VALVES

All quick coupling valves shall be a one piece, 3/4 inch in size, single lug brass or bronze unit with a self-closing rubber cover or as noted on plans. Valves shall be guaranteed to withstand 125 psi pressure without leaking. Quick coupler valves must be installed using a quick coupler key and placed in a valve box with a purple lid that states "non-potable, not safe for drinking." An isolation valve must be installed upstream of each quick coupler or on both sides in the case of a looped main line configuration.

## 2.07 BACKFLOW PREVENTER

The backflow prevention device shall be of the type and size shown on the Drawings. The backflow preventer will be installed at location(s) shown on the drawings and shall be winterized upon installation. Install backflow preventer in accordance with local codes and ordinances.

## 2.08 REMOTE CONTROL WIRE

- A. Connections between the automatic controllers and the remote control valves shall be made with direct burial copper wire AWG-U.F. 600 volt. Pilot wires shall be different color wire for each automatic controller. Common wires shall be white with a different color stripe for each controller. Install in accordance with automatic controller manufacturer's specifications and wire chart. In no case shall wire size be less than WG #14 U.F.
- B. All wire shall be installed according to local electrical codes and must bear UL approved (Type UF) for direct underground burial.

## 2.09 CONTROL WIRE SPLICES

Control wire splices shall be made with Rain Bird DBRY wire connectors, or an approved equal. Connectors shall be of the proper size to match the wire. Only make wire splices in valve boxes or junction boxes approved by the Owner's representative.

## 2.10 VALVE BOXES

- A. Valve boxes for remote control valves shall be a round, thermoplastic, Ametek No. 10-181 014 with twist lock cover No. 10-181-015, or approved equal.



## 2.11 ROTARY POP-UP HEADS

Provide rotary pop-up heads as indicated on the drawings. Rotary pop-up heads shall be installed in a cyclolac or cast metal case. Heads shall pop-up until the nozzle is a minimum of 2" above ground level. If cast metal cases are used they shall have a vinyl or plastic coating. All internal parts shall be removable from above ground. See the equipment schedule on the plans for the performance data.

## 2.12 SPRAY POP-UP HEADS

Pop-up spray heads shall be the type as shown on plans with a 1/2" female inlet. The nozzle shall have the angle of trajectory specified on the equipment schedule, and a screw adjustment for regulating the spray radius. See the Equipment Schedule on the plans for the performance data.

## 2.13 SWING JOINT NIPPLES

All swing joint nipples shall be unplasticized polyvinyl chloride, Schedule 40, threaded pipe. Fittings at swing joints shall be schedule 40 PVC threaded elbows.

# **PART 3 - INSTALLATION**

## 3.01 GENERAL

- A. Provide a complete and properly functioning automatic irrigation system as indicated herein and on the Drawings.
- B. Unless otherwise specified or shown on the plans, the construction of irrigation lines shall include excavation and backfill, the furnishing, installing and testing or irrigation pipe and fittings, and electrical conductors and all other work in accordance with the plans and specifications. The irrigation system installation shall be coordinated with other construction activities.
- C. All valves and other irrigation equipment shall be located in planting areas, unless otherwise noted on the Drawings.

## 3.02 PIPE AND FITTINGS

- A. PVC pipe, couplings and fittings shall be handled and installed in accordance with the manufacturer's recommendations. Each pipe length shall be properly spaced

in jointing to allow for expansion and contraction. Piping will be snaked in trench as shown in the trenching details. If necessary, stakes are to be used to make pipe snake in trench. All stakes are to be removed as the trench is backfilled.

- B. All lines shall have a minimum clearance of six (6) inches from each other and from lines of other trades. Parallel lines shall not be installed directly over one another.
- C. All irrigation piping and valves must meet the separation distances from the on-site sewage facilities system as required from a private water line in 289.91(10) of TAC Title 30 relating to minimum required separation distances for on-site sewage facilities.
- D. Install concrete thrust blocks as indicated on the details in the drawings. Blocking shall be a minimum of 1.5 C.F. each. Set concrete blocking against undisturbed earth.
- E. The interior of the pipe shall be thoroughly cleaned of all foreign matter before being lowered into the trench, and shall be kept clean during laying operations by means of lugs or other approved methods. The pipe shall not be laid in water, or when trench or weather conditions are unsuitable for the work. Water shall be kept out of the trench until the joints are completed. When work is not in progress, open ends of pipe and fittings shall be securely closed so that no trench water, earth or other substance will enter the pipes or fittings. Any pipe that has the grade or joint disturbed after laying shall be taken up and re-laid. Fittings at bends in the pipe line and at ends of lines shall be firmly wedged against the vertical face of the trench by means of concrete thrust blocks.
- F. Joints in all screwed fittings shall be made by applying teflon tape on male threads. Use of pipe joint compound or similar substance is prohibited.
- G. After installation, the lines will be flushed until they are free of rocks, dirt, debris, etc., before the heads are installed.
- H. Pipes and/or sleeves placed underground and not immediately connected to other pipes shall be capped or plugged to prevent water and dirt from entering the pipe. Sleeves for wires shall be capped or sealed with mastic tape after wires have been installed.

### 3.03 AUTOMATIC CONTROLLERS

- A. Controllers shall be installed at locations shown on the plans or as directed by the Owner or Owner's representative. Controllers shall be installed as shown in the

details on the plans. Excavation for proper construction of concrete slab shall be unclassified. Contractor shall dress and clean up around slab upon completion of each unit.

- B. All electrical wiring and connections shall be installed according to the local city and national codes.

### 3.04 GATE AND REMOTE CONTROL VALVES

- A. Install all new valves as indicated on the plans or as may be required for the proper control of the piping systems in which they are incorporated. Valves shall be set vertically. Valves shall be set as shown on the drawings and as approved by the Owner's representative.
- B. Control valves shall be adjusted to give the correct pressure at the spray head.
- C. Teflon tape is to be used on all male threads when installing valves.

### 3.05 QUICK COUPLING VALVES

Quick coupling valves shall be installed in a vertical position as shown in the details and at locations shown on the plans.

### 3.06 BACKFLOW PREVENTER

Backflow preventer shall be installed as shown on drawings and in accordance with the City of Houston codes and ordinances.

### 3.07 REMOTE CONTROL WIRE

- A. Connections between the automatic controllers and the remote control valves shall be made with direct burial copper wire AWG-U.F. 600 volt. Pilot wires shall be different color wire for each automatic controller. Common wires shall be white with a different color stripe for each controller. Install in accordance with valve manufacturer's specifications and wire chart. In no case shall wire size be less than AWG #14 U.F.
- B. All wire shall be installed according to local electrical codes and must be insulated with PVC and bear UL approved (Type UF) for direct underground burial.

### 3.08 CONTROL WIRE SPLICES

- A. Control wire splices shall be made with Rain Bird Pen-Tite wire connectors and

sealant, or an approved equal. Connectors shall be of the proper size to match the wire.

- B. No control wire splices will be permitted between remote control valve boxes and controllers.

### 3.09 VALVE BOXES

Valve boxes shall be installed in an accessible place as shown on plans with top 1" above finished grade. Box shall be level. Box shall sit on a 12" layer of gravel. Box shall be at right angle to the main line.

### 3.10 IRRIGATION HEADS

Irrigation heads shall be installed in plumb position at intervals not to exceed those shown and in the approximate location and configuration shown on the plans. Head swing joints, risers and flexible connectors shall be as shown on the details. All nipples shall be the minimum length required to allow irrigation head adjustment motion without including load on the supply pipe. Irrigation heads shall be installed as detailed on the plans.

### 3.11 DRIP IRRIGATION

- A. Coordinate installation of zone piping and placement of dripline tubing with placement of topsoil and installation of trees, shrubs, and ground cover.
- B. Install 1 and 1 ½-inch solid PVC zone piping a minimum of 18-inches below finished grade. Grade and slope shall be uniform from low point to high points with air/vacuum relief valves installed at high points within an irrigation zone.
- C. Install a flush valve and box at the end of each irrigation zone to facilitate manual flushing. Provide drainage for each flush valve box.
- D. Drip tubing shall be uniform spaced at a minimum of 12-inch to provide uniform wetting at a depth of 3-6 inches below finish grade.
- E. Place air/vacuum relief valve(s) at the highest point(s) of each zone. Connect the air/vacuum relief to all dripline laterals within the most elevated area with an air/vacuum relief lateral.
- F. Place dripline four inches from the edge of the areas to be irrigated. Uniformly space drip tubing such that maximum spacing between drip tubing is 12 inches.

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- G. Thoroughly flush and pressure test the drip tubing to a minimum of 10 psi prior to covering tubing to identify leaks in fittings, splices, and compressions fittings. Repair all leaks.
- H. Exercise extreme care when placing plants so as not to damage or cut any drip tubing or zone piping. Repair or place cut or damage sections as may be warranted.
- I. Install properly sized control wiring in minimum  $\frac{3}{4}$ -inch PVC conduit to each control valve box for each irrigation zone. Bury conduit a minimum of 12-inches below finish grade.
- J. Mount and install irrigation system control panel in filter building (constructed by others). Wire control panel to electric panel in filter building.
- K. Test irrigation system and control panel operation and demonstrate operation to owner's personnel.

### 3.11 TRENCH EXCAVATION AND BACKFILL

- A. The Contractor shall perform all excavation to the depth indicated in these specifications and plans. All excavated material not required for fill or backfill shall be removed from the site. The banks of trenches shall be kept as nearly vertical as practicable. Trenches shall be wide enough to permit proper placing of pipe. Where rock excavation is required, or where stones are encountered in the bottom of the trench, the rock or stones shall be removed to a depth of four (4) inches minimum below the trench depth indicated. The over depth rock excavation and all excess trench excavation shall be backfilled with loose, moist earth or sand, thoroughly compacted. Whenever soil which is wet or otherwise incapable of supporting the pipe is encountered in the trench bottom, such soil shall be removed to a depth and length required and the trench backfilled to trench bottom grade as hereinafter specified, with coarse sand, fine gravel or other suitable material.
- B. Bottom of trench grade shall be continued past ground surface deviations to avoid air pockets and low collection points in line. The minimum cover specifications shall govern regardless of variations in ground surface profile and occasional deeper excavation required at banks and other field conditions. Excavation shall be such that a uniform trench grade variation will occur in all cases where variations are necessary. In no case shall the angle of deflection from one pipe length to another exceed 5 degrees.

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- C. Trench excavation shall consist of the satisfactory removal and disposition of all materials, and shall include all shoring and sheeting required by state and local regulations to protect the excavation and to safeguard employees.
- D. During excavation, materials suitable for backfilling shall be stockpiled in an orderly manner a sufficient distance back from edge of trenches to avoid overloading and prevent slides or cave-ins. No excavated materials shall be placed within or permitted to fall upon roadways.
- E. The trenches shall be carefully backfilled with the excavated materials approved for backfilling, consisting of earth, loam, sandy clay, sand, or other approved materials, free from large clods of earth or stone. Rock, broken concrete or pavements and large boulders shall not be used as backfill material. The backfill shall be thoroughly compacted and evened off with the adjacent soil level. Any materials not suitable for backfill shall be removed from the site and disposed of.
- F. Select fill dirt or sand shall be used if soil conditions are rocky. In rocky areas the trenching depth shall be four inches below normal trench depths to allow for this bedding. The fill or dirt or sand shall be used in filling four inches above the pipe or wires. The remainder of the backfill shall contain no lumps or rocks larger than one inch. The top six inches of backfill shall be free of rocks, subsoil or trash.
- G. Backfill shall be placed in layers, the thickness of the layers shall depend on the nature of the material and the method of compaction used. Compaction shall be accomplished in such a manner as to assure that there will be no future subsidence.
- H. Any trenches improperly backfilled, or where settlement occurs, shall be reopened to the depth required for compaction, then filled and compacted with the surface restored to the required grade and left in a completed surface condition as described above.
- I. All excavation and backfill shall be unclassified and covered in the base bid. No additional charges will be allowed for rock encountered.

### 3.12 LEAK TEST

- A. When the main line or sections of the main line, laterals, swing joints and valves have been installed, the system (or section) will be thoroughly flushed. The system (or section) will then be pressurized for 8 hours at the operating pressure.

- B. All joints and connections shall be pressure tested and checked for leaks prior to backfilling.
- C. Lateral lines, from the control valve to the spray head, shall be tested by capping the pipe at the sprinkler head and pressurizing the pipe to operating pressure for 8 hours.
- D. Any leakage found will be repaired and retested for another 8 hour period prior to backfilling.

### 3.13 CLEANING AND FLUSHING SYSTEM

After pipe, fittings, and valves have been installed and connections made to the water source, flush pipes several times until free of all rocks, dirt, trash, pipe shavings or debris before installing heads. After the pipe has been thoroughly flushed, start installing the heads with the water running, beginning with the one nearest the valve and working toward the ends of the laterals forcing the water and any debris left in the pipe out the last head connection. After the heads have been installed the system is to be operated several times before final inspection. The heads shall also be cleaned or replaced if necessary before final inspection.

### 3.14 EXISTING PLANT MATERIALS

Where it is necessary to excavate adjacent to existing plant materials, the Contractor shall use all possible care to avoid injury to plants and plant roots. Excavation in areas where two (2) inch and larger roots occur shall be done by hand. All roots two (2) inches and larger in diameter, except directly in the path of pipe or conduit, shall be tunneled under and shall be heavily wrapped with burlap to prevent scarring or excessive drying. Where a trencher is run close to plants having roots smaller than two (2) inches in diameter, the wall of the trench adjacent to the tree shall be hand trimmed, making clean cuts through. Roots one (1) inch and larger in diameter shall be painted with two coats of Tree Seal, or equal. Trenches adjacent to plant should be closed within twenty-four (24) hours; and where this is not possible, the side of the trench adjacent to the plant shall be kept shaded with burlap or canvas.

### 3.15 TEMPORARY REPAIRS

The Owner reserves the right to make temporary repairs as necessary to keep the irrigation system equipment in operating condition. The exercise of this right by the Owner shall not relieve the Contractor of his responsibilities under the terms of the guarantee as herein specified.

3.16 CLEANUP

- A. Make final cleanup of all parts of the work before final acceptance. This cleanup shall include removal of all construction materials and equipment, and in general leaving the site in an orderly and finished appearance.
- B. The Contractor shall also remove from the site any rock or extra soil resulting from this contract and he shall restore the site to its original condition or better.

END OF SECTION 32 80 00



## **SECTION 32 90 00**

### **PLANTING**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Related Documents: Drawings and general provisions of Contract, including General and Supplementary Conditions.

##### **1.2 DESCRIPTION OF WORK**

- A. Extent of the landscape development work is shown on the drawings and in the schedules. Landscape work shall include the supplying of all materials and completion of all work items associated with the installation, warranty and maintenance of all trees, shrubs, groundcover, vines, perennials, annuals, grasses, and lawns shown on the plans and specified herein. Further landscape work shall include all ancillary materials necessary to complete the work as specified including but not limited to topsoil, mulch, filter fabrics, fertilizers, stakes, guys, etc.
- B. Subgrade Elevations: Excavations, filling and grading required to establish elevations shown on the drawings are not specified in this section.
- C. Grading: Landscape Contractor will be responsible for providing and installing prepared soil material to meet finish grades.

##### **1.3 QUALITY ASSURANCE**

- A. Any Subcontractors to be under Subcontract to the Contractor shall be identified to the Owner prior to construction.
- B. Source Quality Control:
  - 1. American Association of Nurserymen, Inc. (AAN) Standard: American Standard for Nursery Stock (ANSI Z60.1-1986)
  - 2. Hortus Third, Cornell University, 1976
  - 3. Fertilizers; Mixed Commercial.

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- C. General: Ship landscape materials with certificates of inspection as required by governing authorities. Comply with governing regulations applicable to landscape materials.
- D. Do not make substitutions: If specified landscape material is not obtainable, submit to Landscape Architect proof of non-availability and proposal for use of equivalent material. When authorized, adjustment of contract amount will be made.
- E. Analysis and Standards: Package standard products with manufacturer's certified analysis.
- F. Trees and Shrubs: Provide trees and shrubs grown in a recognized nursery in accordance with good horticultural practice. Provide healthy, vigorous stock grown under climatic conditions similar to conditions in the locality of the project and free of disease, insects, eggs, larvae, and defects such as knots, sun-scald, injuries, abrasions, or disfigurement.
  - 1. Sizes: Provide trees and shrubs of the sizes shown or specified. Trees and shrubs of larger size may be used if acceptable to Landscape Architect, and if sizes of roots or balls are increased proportionately.
- G. Inspection: The Landscape Architect reserves the right to inspect trees and shrubs at place of growth or at site before planting, for compliance with requirements for name, variety, size and quality.
- H. Notify the Landscape Architect of material location for tagging no less than 30 days prior to digging.

#### 1.4 SUBMITTALS

- A. Samples: Representative samples of the following materials shall be provided to the Landscape Architect from the supply source being used:
  - 1. Plant Material: Samples or photos may be requested in lieu of inspection.
  - 2. Mulch: 5 lb. sample.
  - 3. Staking and guying material.
  - 4. Package label for each type of fertilizer to be used as specified.

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B. Test Reports: Submit to the Landscape Architect copies each of certified test reports for:

1. Topsoil.
2. Compost

C. Certification:

1. Phytosanitary Certification: All plant material inspection certificates required by federal, state or other governing authorities will accompany each shipment and be turned over to the Landscape Architect upon delivery.

D. Invoice: Vendor or grower's invoice for each shipment of plants shall show sizes, quantities, and root treatment of plants, i.e., containerized, balled and burlapped, or bare root.

E. Construction Schedule: Upon authorization to proceed with the work, submit copies of Construction Schedule indicating dates for the items of work.

F. Maintenance Instructions: Submit copies of instructions recommending procedures to be established by the Owner for the maintenance of landscape work for one (1) full year. Submit prior to expiration of required maintenance period.

G. Toxic Chemicals: Submit products; rates of application; and anticipated use of pesticides, herbicides, and fumigants.

## 1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Plant Materials: As indicated in the drawings.

B. Trees and Shrubs: Provide freshly dug trees and shrubs. Do not use trees or shrubs which have been in cold storage or heeled-in. Do not prune prior to delivery. Do not bend or bind-tie trees or shrubs in such manner as to damage bark, break branches, or destroy natural shape. Provide protective covering during delivery.

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- C. Deliver trees and shrubs after preparations for planting have been completed and plant immediately. If planting is delayed more than six (6) hours after delivery, set trees and shrubs in shade, protect from weather and mechanical damage, and keep roots moist.

## 1.6 JOB CONDITIONS

### A. General:

1. Prior to beginning work, the Contractor shall examine and verify the acceptability of the job site and notify the Landscape Architect of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected or resolved in writing by the Landscape Architect.
2. Where planting occurs in close proximity to other site improvements, adequate protection shall be given to all features prior to commencing work. Any items damaged during planting operations shall be promptly repaired to their original condition at no cost to the Owner.

B. Planting Time: Plant material shall not be installed during the months of July and August or during periods when temperatures exceed 95 degrees, or when earth is frozen, except when approved by Landscape Architect. Correlate planting with specified maintenance periods to provide maintenance from date of substantial completion of landscape work.

C. Existing Irrigation: Any damage to existing irrigation systems will be the responsibility of the landscape contractor.

D. Utilities: Have all underground utilities located by servicing agencies. In the vicinity of utilities, hand excavate to minimize possibility of damage to underground utilities.

E. Excavation: When conditions detrimental to plant growth are encountered such as rubble fill, adverse drainage conditions, or obstructions, notify Landscape Architect before planting for written recommendation to remedy condition.

### F. Planting Season:

1. Materials shall be installed during planting seasons normally recognized

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in the job locality for the species being utilized.

G. Work Schedule:

1. Upon authorization to proceed with the work, submit a project work schedule indicating the dates of each of the following items:
  - a. Tagging of plants in nurseries.
  - b. Staking of plant locations on the site.
  - c. Delivery of other materials to the site.
  - d. Digging and preparation of plant pits and beds.
  - e. Delivery of plant material to the site.
  - f. Planting.
  - g. Substantial completion of the work.
2. Notify Landscape Architect in advance of any deviations from schedule.

I. Coordination With Other Work:

1. Proceed with and complete landscape work as rapidly as portions of the site become available, working within the seasonal limitations for each kind of landscape work required.

1.7 GUARANTEE

- A. Guarantee lawns through the specified maintenance period.
- B. Guarantee trees and shrubs through 2 complete growing seasons.
- C. All trees and shrubs planted in the fall shall be alive in the following planting season.
- D. Warrant all plant material to be true to botanical name, variety, and specified size.
- E. After receiving a Notice of Provisional Acceptance, all plant materials shall be maintained in a vigorous condition and warranted against defects including death, improper maintenance, and unsatisfactory growth for the following time periods:
  1. Guarantee lawns for 90 days.
  2. Guarantee trees, shrubs, vines grasses and groundcover for 365 days.

PLANTING

32 90 00-5

100% Construction Documents – January 17, 2024

- F. During the warranty period, replace, at no additional expense to the Owner, plant materials that are dead or that are, in the opinion of the Landscape Architect, in an unhealthy or unsightly condition, or that have lost their natural shape due to dead branches, excessive pruning, or inadequate or improper maintenance. Rejected plant materials shall be removed from the site and legally disposed of at no additional expense to the Owner.
- G. Replacement plants and planting operations shall be in accordance with the original specifications. Replacements shall be made as soon as possible but no later than the next succeeding planting season. Fully restore areas damaged by replacement operations to their original and specified condition.

## **PART 2 - PRODUCTS**

### 2.1 SOIL AMENDMENTS:

- A. Commercial Fertilizer: Must meet the following minimum specifications as well as conform to the fertilizer laws in effect as regulated by the Texas Department of Agriculture. Provide fertilizer in bags clearly labeled with name and address of the manufacturer, weight and guaranteed analysis. Fertilizer shall be delivered to the job site(s) in clean, unopened and undamaged bags. Complete fertilizer of neutral character, with some elements derived from organic sources and containing the following percentages of available plant nutrients.
  - 1. For lawns, provide fertilizer with not less than 6% phosphoric acid and not less than 4% potassium, and the percentage of nitrogen required to provide not less than 1 lb. of actual nitrogen per 1000 sq. ft. of lawn area.
  - 2. For seeded grass areas, provide a min. NPK formula with a ratio of 1;2:1 with 70% stabilized Nitrogen for establishment and 3:1:2 with 50% stabilized Nitrogen for promotion. Fertilizer containing objectionable materials that may hinder proper distribution such as caked fertilizer will be rejected.
  - 3. For groundcover beds, provide 10-10-10 fertilizer applied at 3lbs. per 1000 sq. ft.

PLANTING

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4. For trees and shrubs, Scott Agriform Planting Tablets per manufacturer's recommendations for quantity and rate for the size and species, or approved equal.

**B. Soil Conditioners**

1. Soil conditioners will be Granulated Lime (CaCO<sub>3</sub>), Sulfur (S), or Gypsum (CaSO<sub>4</sub>).
2. Soil conditioners will be delivered to the job site in clean, unopened and undamaged bags.
3. Apply soil conditioners to seedbed prior to seeding or as part of a hydro-seeding or overseeding application or as directed. Apply at the maximum rates listed below for each product.
  - a. Gypsum – 2,500 lbs. per acre
  - b. Sulfur – 300 lbs. per acre
  - c. Lime – 2,500 lbs. per acre

**C. Topsoil: Friable topsoil.**

**D. Sand: Coarse river sand (100% passing through 30 mesh screen).**

**E. Leaf Mold: Composted leaves, deteriorated such that individual leaves are indistinguishable.**

**F. Peat Moss: Shall be finely shredded, consisting of 90% organic moss peat, be brown in color and suitable for horticultural purposes. Shredded particles shall not exceed 1/2" in diameter.**

**F. Staking and Guying Materials: Provide new sound materials per details on drawings. Staking must be capable of remaining effective for two (2) years.**

**G. Mulch: Clean shredded hardwood bark mulch.**

**H. Turface: Provide a calcined clay product of brand name or approved equal.**

**I. Bed Edger: 1/2 x 4 Benda Board by Epic Plastics, Distributed by Ewing, Installed as recommended by manufacturer.**

**PLANTING**

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## 2.2 PLANT MATERIALS

- A. Name and Variety: Provide plant materials true to name and variety established by the American Joint Committee on Horticultural Nomenclature "Standardized Plant Names", Second Edition, 1942.
- B. Quality: Provide trees, shrubs and other plants complying with the recommendations and requirements of ANSI Z60.1 "Standard for Nursery Stock" and as further specified.

## 2.3 GRASS MATERIALS

- A. Sod: Provide strongly rooted sod of 100% Bermuda (Cynodon Dactylon), not less than two years old and free of weeds and undesirable native grasses. Provide only sod capable of growth and development when planted (viable, not dormant).
- B. Grass Seed: Provide fresh, clean, new-crop seed complying with the tolerance for purity and germination established by the Official Seed Analysts of North America. Provide seed of the grass, species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified on plans.

## 2.4 GROUND COVER

- A. Provide plants established and well-rooted in removable containers or integral peat pots and with not less than the minimum number and length or runners required by ANSI Z60.1 for the pot size shown or listed.

## 2.5 PREPARATION OF PLANTING SOIL

- A. Assemble:
  - 2 parts sharp sand
  - 3 parts pine bark mulch
  - 3 parts compost
- B. Mixed thoroughly to provide equal distribution.
- C. Mulch: Double ground bark mulch.

PLANTING

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## **PART 3 - EXECUTION**

### 3.1 PREPARATION

- A. Layout individual tree and shrub locations and areas for multiple plantings. Stake locations and outline areas and secure Landscape Architect's acceptance before start of planting work. Make minor adjustments as may be requested without cost to Owner.
- B. If obstructions are encountered that are not indicated, do not proceed with planting operations until alternative plant locations have been selected and approved in writing by the Landscape Architect. Where location or spacing dimensions are not clearly shown, request clarification by the Landscape Architect.
- C. Preparation for Planting Lawns:
  - 1. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 4 inches (100 mm). Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
    - a. Apply fertilizer directly to subgrade before loosening.
    - b. Thoroughly blend planting soil mix off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.
    - c. Spread planting soil mix to a depth of 4 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
    - d. Reduce elevation of planting soil to allow for soil thickness of sod.
  - D. Unchanged Subgrades: If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:
    - 1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
    - 2. Loosen surface soil to a depth of at least 6 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 6 inches of soil. Till soil to

PLANTING

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a homogeneous mixture of fine texture. Apply fertilizer directly to surface soil before loosening.

3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter.
4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.

G. Finish Grading: Grade planting areas to a smooth, uniform surface with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future. Grade for proper drainage.

H. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

I. Before planting, restore areas if eroded or otherwise disturbed after finish grading.

J. Preparation of Groundcover and Planting Beds:

1. Excavate existing soils to a depth of 12" for perennial and shrub beds and 6" for groundcover and annual beds.
2. Roto till to a depth of 3" after excavation.
3. Install planting mix and fertilizer to a depth of 12" for perennial and shrub beds and 6" for groundcover and annual beds.
4. Grade beds for proper surface drainage.

### 3.2 PLANTING

A. Planting Trees:

1. Excavate pit to twice the diameter of the tree ball and not less than 6" deeper. Compact a layer of topsoil in pit to locate collar of plant properly in a slightly dished finish grade. Place Agriform plant tablets in pit at rate per manufacturer's recommendations. Backfill around ball with topsoil compacted to eliminate voids and air pockets, watering thoroughly as layers are placed. Build 3" high berm of topsoil beyond edge of excavation. Apply 3" mulch of wood chips.
2. Cut away burlap, rope, wire, or other wrapping materials from the top of

PLANTING

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the ball and remove from pit. Do not remove burlap or ties from sides or bottom of ball. If plastic wrap or other non-degradable materials are used in lieu of burlap, completely remove them before placing of backfill. Cleanly cut off broken or frayed roots.

3. Backfill around ball with soil compacted to eliminate voids and air pockets, watering thoroughly as layers are placed. Build 3" high berm of topsoil beyond edge of excavation. Apply 3" mulch within 48 hours of planting.
  4. Prune trees to remove damaged branches, improve natural shape, thin out structure and remove not more than 15% of branches. Paint cuts more than 1-1/2" in size with pine tar.
  5. Paint cuts over 1-1/2" in size with standard tree paint or compound, covering exposed, living tissue.
  6. Guy and stake trees immediately after planting with galvanized wire, through garden hose tree protectors, with green metal T-Post anchors. See typical planting detail on drawings. Keep supports in place during entire guarantee period.
- B. Planting Shrubs: Excavate pit to twice the diameter of balls or containers. Place Agriform plant tablets in pit at rate per manufacturer's recommendations.  
Backfill around plants with soil, compacted to eliminate voids and air pockets. Form grade slightly dished, and bermed at edges of excavation. Apply 3" mulch and water thoroughly.
- C. Mulch: Mulch all planting beds to a depth of 3".
- D. Sodding New Lawns:
1. Lay sod within 24 hours from time of stripping. Do not plant dormant sod or if ground is frozen.
  2. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod strips; do not stretch or overlap. Stagger strips to offset joints in adjacent courses. Work from boards to avoid damage to subgrade or sod. Tamp or roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil into minor cracks

**PLANTING**

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between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

3. Lay sod across angle of slopes exceeding 1:3
4. Anchor sod on slopes exceeding 1:6 with wood pegs spaced as recommended by sod manufacture but not less than 2 anchors per sod strip to prevent slippage.
5. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.
6. Apply fertilizer per Section 2.1 above.

E. Seeding New Lawns:

1. Place topsoil approx. 4" deep and till in. If on slope, till parallel to contours to discourage riling.
2. Sow seed using a spreader or seeding machine. Do not seed when wind velocity exceeds five miles per hour. Distribute seed evenly over entire area by sowing equal quantity in two directions at right angles to each other.
3. Sow not less than the quantity of seed specified or scheduled.
4. Rake seed lightly into top 1/8" of soil. If on slope, rake parallel to contour. Roll lightly and water with a fine spray.
5. Protect seeded areas against erosion by placing erosion control blankets after completion of seeding operations. Spread uniformly to form a continuous blanket over seeded areas.
6. Apply fertilizer per Section 2.1 above.

F. Planting Groundcover:

1. Prepare planting bed as specified in Section 3.1.

2. Space groundcover plants as indicated on plans.
3. Dig holes large enough to allow for spreading of roots. Backfill with planting soil. Work soil around roots to eliminate air pockets.
4. Rake and smooth surface and place min. 3" depth of mulch.
5. Water thoroughly after planting, taking care not to cover crowns of plants with wet soils.
6. Apply fertilizer per Section 2.1 above.

### 3.3 MAINTENANCE

- A. Maintain trees, shrubs and groundcover for a period of 365 calendar days immediately following complete installation. Include watering, weeding, cultivating, restoration of grade, pruning trees and shrubs, protection from insects and diseases, fertilizing and similar operations as needed to ensure normal growth and good health for live plant material.
- B. Maintain Lawns for a period of 90 calendar days immediately following complete installation. Include watering, weeding, mowing and trimming, protection from insects and diseases, fertilizing and similar operations as needed to ensure normal growth and good health for live plant material.
- C. Maintenance During Installation: Planting maintenance shall begin immediately after each plant is planted and shall continue as required until final acceptance.
- D. Plants shall be inspected at least once per week by the Contractor during the installation period and needed maintenance performed promptly.
- E. The Contractor shall irrigate all plants on a schedule approved by the Landscape Architect. The schedule shall maintain an adequate supply of moisture within the root zone. If the irrigation system is inoperative, hand watering shall be accomplished from a course approved by the Landscape Architect. Water shall not be applied with a force that will displace mulch or cause soil erosion and shall not be applied so quickly that it cannot be absorbed by the mulch and plants.

PLANTING  
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- F. Plants shall be pruned and mulch replaced as required.
- G. Stakes, guys, and eroded plant saucers shall be tightened or replaced as required.
- H. In plant beds, grass and weeds shall not be allowed to reach a height of 3" before being completely removed, including root growth.
- I. Other work such as spraying with approved insecticides and fungicides to control pests shall be done to insure plant survival in a health growing condition.
- J. Dead plants shall be removed immediately at the Contractor's expense.

### 3.4 CLEANUP AND PROTECTION

- A. Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades and trespassers. Maintain protection during installation and maintenance periods. Treat, repair or replace damaged landscape work as directed.

### 3.5 ACCEPTANCE

- A. Inspections for Acceptance of Work:

#### 1. Provisional Acceptance Observation

- a. Notify the Landscape Architect in writing of the completion of planting.
- b. Within ten (10) days after notification of completion of work, the Landscape Architect will observe the work and prepare a Notice of Provisional Acceptance, along with a list of items that require completion or correction.
- c. Issuance of the Notice of Provisional Acceptance shall constitute the start of the warranty period for portion accepted.

#### 2. Final Acceptance Observation

- a. The final observation of all planting or phase of planting work under the contract will be made by the Owner, Contractor, and Landscape Architect.

- b. Before final acceptance will be made, the terms of the warranty shall be met.

END OF SECTION 32 90 00

# FBC Elections Administration Building

3700 Bamore Rd. Rosenberg TX, 77471

01/07/2023



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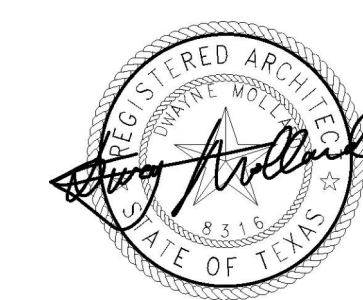
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**FOR BID & PERMIT**

12/07/2023

Project No. 2330

Architect



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3700 Bamore Rd. Rosenberg TX, 77471

3700 BAMORE ROAD ROSENBERG, TX 77471 FOR BID AND PERMIT

A B

KEY PLAN PLAN NORTH TRUE NORTH

Project No.: 2330

Drawing Date: 01.17.2024 Drawn: YG Checked: DM Scale: AS NOTED

Issue Log table with columns: No., Description, Date. Includes Revisions table with columns: No., Description, Date.

SHEET INDEX, DRAWING CONVENTIONS, AND LOCATION G0.01

DRAWING CONVENTIONS. Includes symbols for property lines, area drains, elevations, match lines, and various annotations.

ABBREVIATIONS table listing abbreviations for various building components and materials, such as AREA DRAIN, AREA DRAIN, AMERICANS WITH DISABILITIES ACT, etc.

DRAWING INDEX table listing drawing titles and sheet numbers, categorized by GENERAL, CIVIL, LANDSCAPE, STRUCTURAL, ARCHITECTURAL, and MECHANICAL.

MATERIALS CONVENTIONS. Includes patterns and symbols for site construction, concrete, masonry, woods and plastics, thermal & moisture protection, glazing, and finishes.

SITE LOCATION MAP. Aerial map showing the project location in Rosenberg, Texas, near Cottonwood and other landmarks.

SHEET NUMBERING. Explains the format A2.01A and provides a key for building area, sequence, and discipline type.

MECHANICAL table listing drawing titles and sheet numbers for mechanical systems, including MEP1.0, M1.0, M1.1, M1.2, M2.0, etc.

**PROJECT INFORMATION**

**APPLICABLE BUILDING CODES & REGULATIONS**

- 2018 INTERNATIONAL BUILDING CODE
- 2018 INTERNATIONAL FIRE CODE
- 2015 UNIFORM MECHANICAL CODE
- 2015 UNIFORM PLUMBING CODE
- 2017 NATIONAL ELECTRICAL CODE
- 2015 INTERNATIONAL ENERGY CONSERVATION CODE
- 2012 TEXAS ACCESSIBILITY STANDARDS

\*\*CITY OF ROSENBERG AMENDMENTS WILL APPLY\*\*

**CIVIL REFERENCE:**

**TDLR PROJECT NO.**

TABS2024008536

**PROJECT DESCRIPTION**

Proposed facility for Fort Bend County with office space for elections administration and warehouse for voting and general equipment storage

**BUILDING NAME:**

Fort Bend County Administration Building

**BUILDING ADDRESS:**

3700 Bamore Rd. Rosenberg, TX 77471

**LEASE SPACE ADDRESS AND/OR SUITE NO.**

**SCOPE OF PROJECT:**

- NEW CONSTRUCTION:  X
- ADDITION: \_\_\_\_\_
- REMODEL: \_\_\_\_\_
- FOUNDATION: \_\_\_\_\_
- DEMOLITION: \_\_\_\_\_
- OTHER: \_\_\_\_\_

**GRADE ELEVATION OF BUILDING:**

95'

**BUILDING LENGTH:**

445' - 0"

**BUILDING WIDTH:**

109' - 0"

**TOTAL SQUARE FOOTAGE (GROSS):**

48,007 SF

**NUMBER OF FLOORS:**

1

**ESTIMATED COST OF CONSTRUCTION:**

\$12,000,000

**SPRINKLERED:**

YES

**OCCUPANCY TYPE:**

- SINGLE OCCUPANCY:  X
- MIXED OCCUPANCY: \_\_\_\_\_
- SEPARATED USES: \_\_\_\_\_
- NON-SEPARATED USES: \_\_\_\_\_

**OCCUPANCY SEPARATION REQUIREMENTS:**

(Per Table 508.4)

**CONSTRUCTION TYPE:**

(Per Section 602)

II-B

**ALLOWABLE HEIGHT:**

(Per Table 504.3 AND 504.4)

75' - 0"

**ALLOWABLE AREA:**

(Per Table 506.2)

70,000 SF

**ACTUAL HEIGHT:**

25' - 6"

Number of Exits and Exit Width from Each Floor	Number of Exits (Per Table 1021)		Exit Width (Per Table 1005.3)			
	Required	Provided	Stairs		Other Egress Components	
			Required	Provided	Required	Provided
First Floor	2	5	N/A	N/A	29.4"	288"

Exit Access Travel Distance (Per Table 1016.1)		
Occupancy	Maximum Travel Distance	Travel Distance Provided
Business (B)	300' - 0"	98' - 0"
Warehouse (S-1)	250' - 0"	198' - 0"

R Value Required	
Walls	R-5.7ci
Roof	R-25ci

Note: in an existing building, General Contractor to verify the existing conditions and supplement the above specified values to achieve a value that complies with the Local Energy Code and any Local Amendments.

**Minimum Corridor Width:** 44" minimum unless provided for otherwise in the Exceptions  
(Per Section 1017.2)

**Minimum Means of Egress Height:** 7'-6" per NFPA unless provided for otherwise in the Exceptions  
(Per Section 1003.2)

**Maximum Dead-End Corridor** 50'-0" maximum based on Exception 2  
(Per Section 1017.3)

**Common Path of Egress Travel** 75'-0" maximum in occupancies other than group H-1, H-2, H-3 unless provided for otherwise in the Exceptions  
(Per Section 1014.3)

Plumbing Fixture Counts						
Occupancy and Area Served	Load Factor Water Closets	Load Factor Lavatories	Occupant Load	Water Closets	Lavatories	Drinking Fountains
				Required	Required	Required
BUSINESS (13,203 SF)	1 PER 25 THEN 1 PER 50 OVER 50	1 PER 40 THEN 1 PER 80 OVER 80	88	3	2	1
WAREHOUSE (34,804 SF)	1 PER 100	1 PER 100	71	1	1	1
<b>Total Number of Fixtures</b>				<b>Required Provided</b>	<b>Required Provided</b>	<b>Required Provided</b>
				4 5	3 5	2 2

OWNER TO PROVIDE

Fire-Resistance Rating Requirements for Building Elements (hours) (Per Table 601)			
Building Element	Rating Required	Rating Provided	U.L. Assembly #
Structural Frame	0 HR	0 HR	
Bearing Walls - Exterior	0 HR	0 HR	
Bearing Walls - Interior	0 HR	0 HR	
Non-bearing walls and partitions - Exterior (Table 602)	0 HR	0 HR	
Non-bearing walls and partitions - Interior (IBC 602.4.6)	0 HR	0 HR	
Floor construction	0 HR	0 HR	
Roof construction	0 HR	0 HR	

Interior Finish Material Requirements (per Table 803.9)				
Building Group	Exit Enclosures & Passageways	Corridors	Rooms & Enclosed Spaces	Sheet
B	A	B	C	
S-1	B	B	C	



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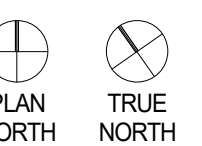
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3700 Bamore Rd. Rosenberg TX, 77471

3700 BAMORE ROAD  
ROSENBERG, TX 77471  
FOR BID AND PERMIT



Project No.: 2330

Drawing Date: 12/07/23  
Drawn: YG  
Checked: DM  
Scale: AS NOTED

**Issue Log**

No.	Description	Date

**Revisions:**

No.	Description	Date

**CODE ANALYSIS & LIFE SAFETY**

**G0.10**



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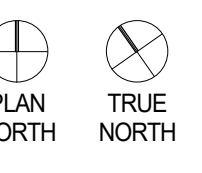
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3700 Bamore Rd. Rosenberg TX, 77471

3700 BAMORE ROAD  
ROSENBERG, TX 77471  
FOR BID AND PERMIT



Project No.: 2330

Drawing Date: 12/07/23  
Drawn: YG  
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Scale: AS NOTED

Issue Log		
No.	Description	Date

Revisions		
No.	Description	Date

LIFE SAFETY -  
WAREHOUSE &  
ADMIN

G0.11

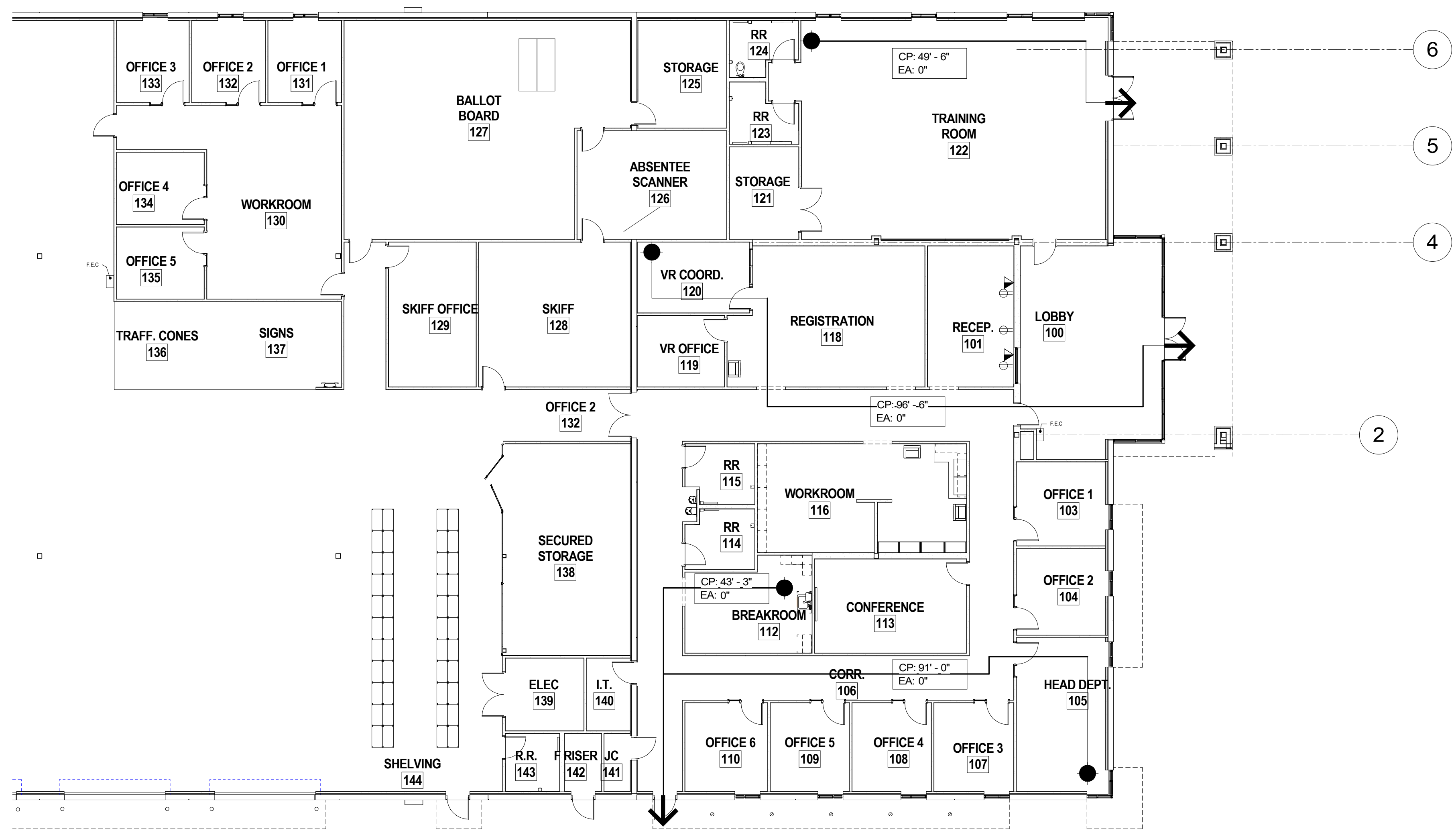
FUNCTION OF SPACE LEGEND - IBC 2015

FUNCTION OF SPACE:

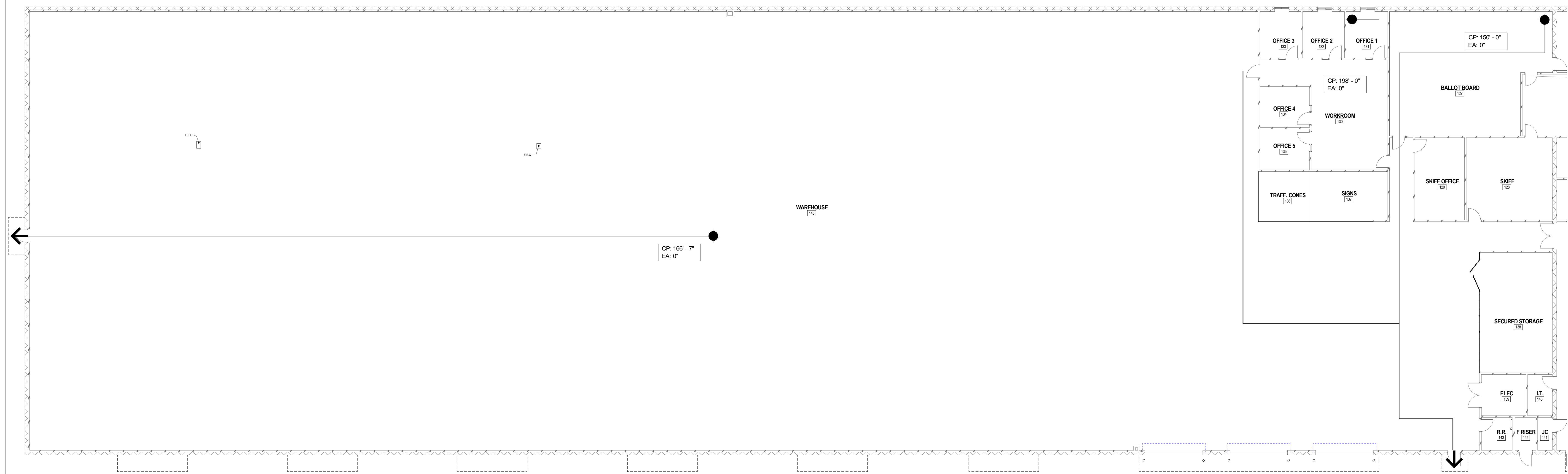
- WAREHOUSE
- ADMINISTRATION

LIFE SAFETY SYMBOLS LEGEND

- MEANS OF EGRESS - PATH OF TRAVEL
- MEANS OF EGRESS - COMMON PATH OF TRAVEL
- EXIT
- EXIT DISCHARGE
- 1-HR FIRE RATED
- 2-HR FIRE RATED
- 3-HR FIRE RATED
- FIRE EXTINGUISHER CABINET
- F.E.C.
- COMMON PATH OF TRAVEL/  
EXIT ACCESS TRAVEL  
DISTANCE



2 LIFE SAFETY - ADMIN  
3/32" = 1'-0"



1 LIFE SAFETY - WAREHOUSE  
3/32" = 1'-0"

Autodesk Docs/2330 FBC Elections Admin Facility revit 2023/24\_0105 FBC Election admin.rvt 1/17/2024 4:20:49 PM

Autodesk Docs/2330 FBC Elections Admin Facility revit 2023/24\_0105 FBC Election admin.rvt  
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DESCRIPTION	APPL. TO
WATER CLOSET To Top of Seat	17'-0"
Clear Floor Space	30'-0"
Flush Control Height (Min)	48"
URINAL, Max. To Top of Basin	17"
Flush Control Height (Max)	48"
LEAVY/DOOR Front Approach	
Wheel Clearance (Min)	27"
To Top of Basin	30"
To Hand Rest	30"
FIXED OR BUILT IN	
Height of Table or Counter	28'-30"
Wheel Clearance (Min)	27"
SHelves, Dispensers: Min. Height to Control Device	
Frontal Approach (Min)	48"
Side Approach (Min)	48"
OVERHEAD TOOLS/SHES	
To Top of Basin	30"
Wheel Clearance (Min)	27"
SWITCHES AND CONTROLS	
Frontal Approach (Min)	48"
Side Approach (Min)	48"
MIRRORS: Max. Height to Bottom of Reflective Surface	
At Location and Counter Top	48"
Full Height	30"
MIRRORS: Max. Height to Top of Reflective Surface	
Full Height	30"
Full Length	30"
SOCKET PAPER DISPENSER: Height to Center of Roll Sheet	17"
PAPER TOWEL DISPENSER: Height to Operating Mechanism	48"
SHOWER	
Top of Seat	17'-0"
Grab Bar	33'-30"
To Hand Shower Head Mounting (Min)	48"
WALLER SOURCES: TOOLS/SHES	COOPER: MOUNTING HEIGHT WITH COVER FROM TO INSTALLATION

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**KEY PLAN**

PLAN NORTH  
TRUE NORTH

Project No.: 2330  
Drawing Date: 12/07/23  
Drawn: YG  
Checked: DM  
Scale: AS NOTED

Issue Log:

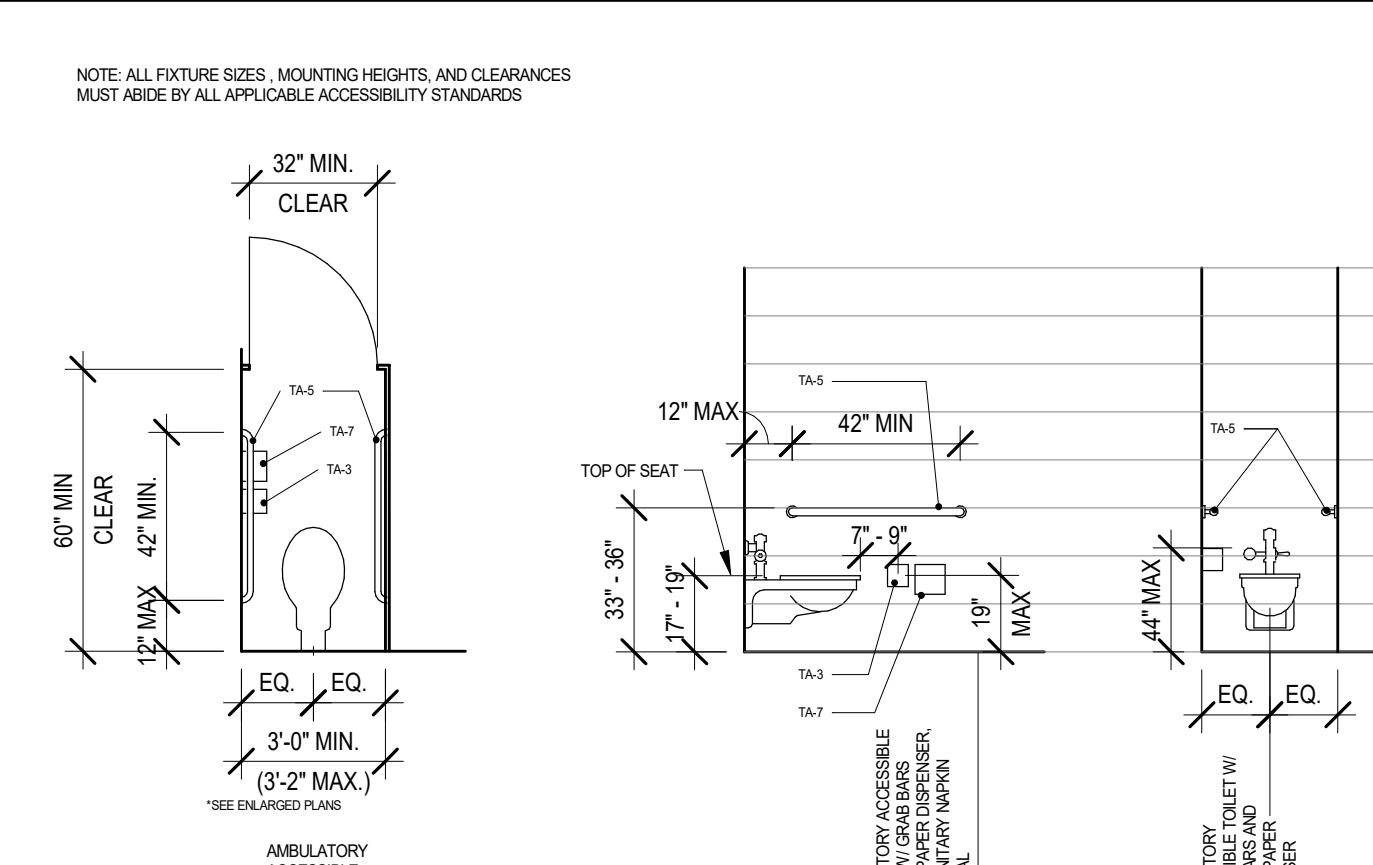
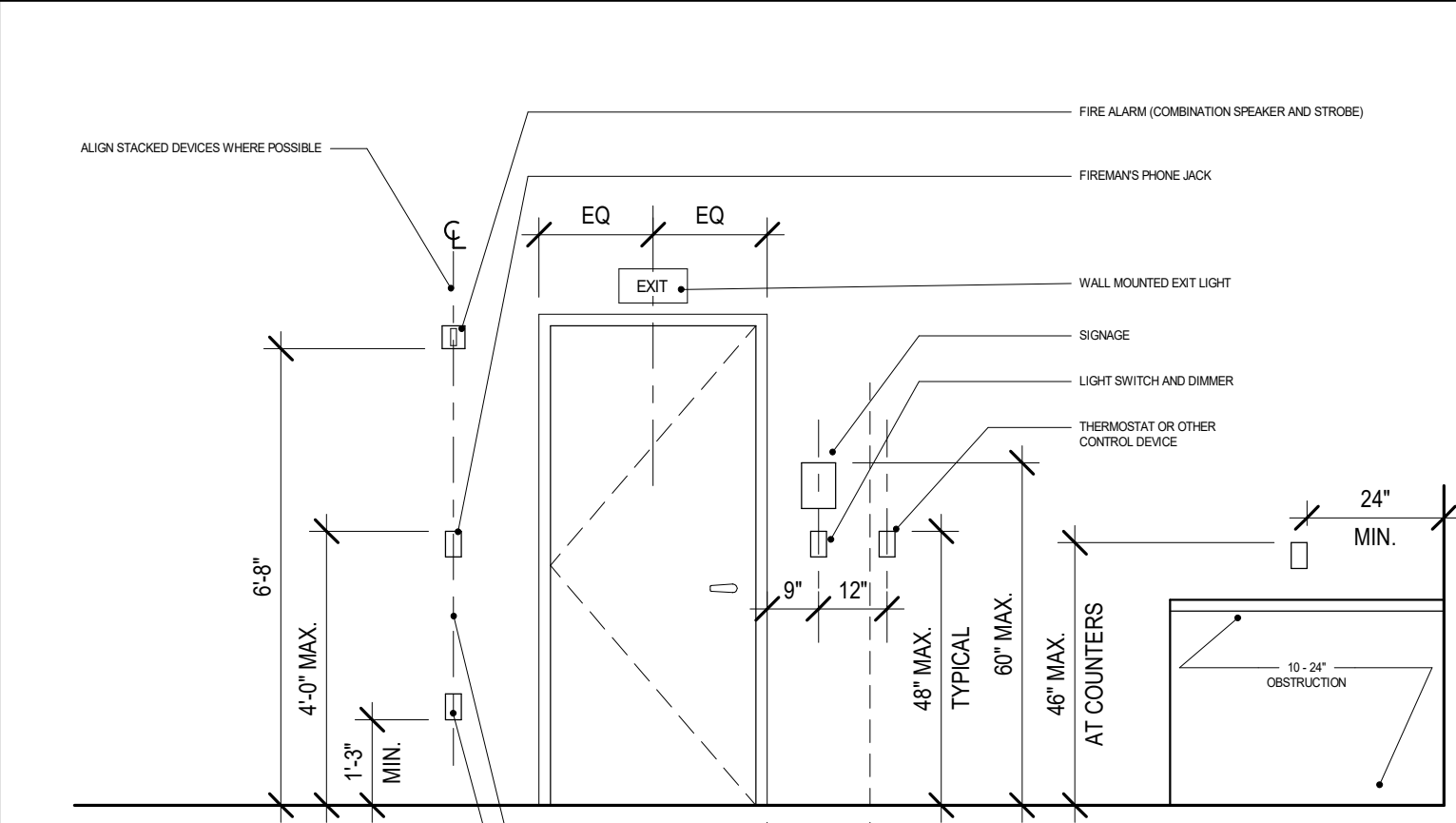
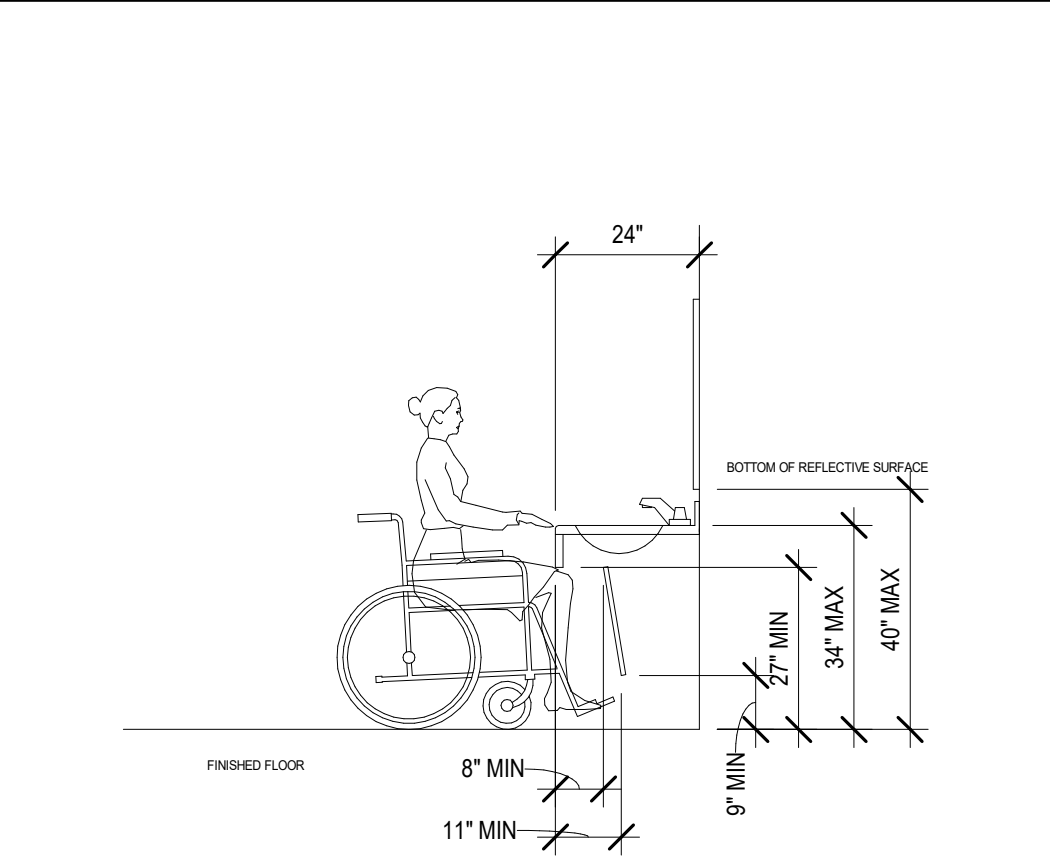
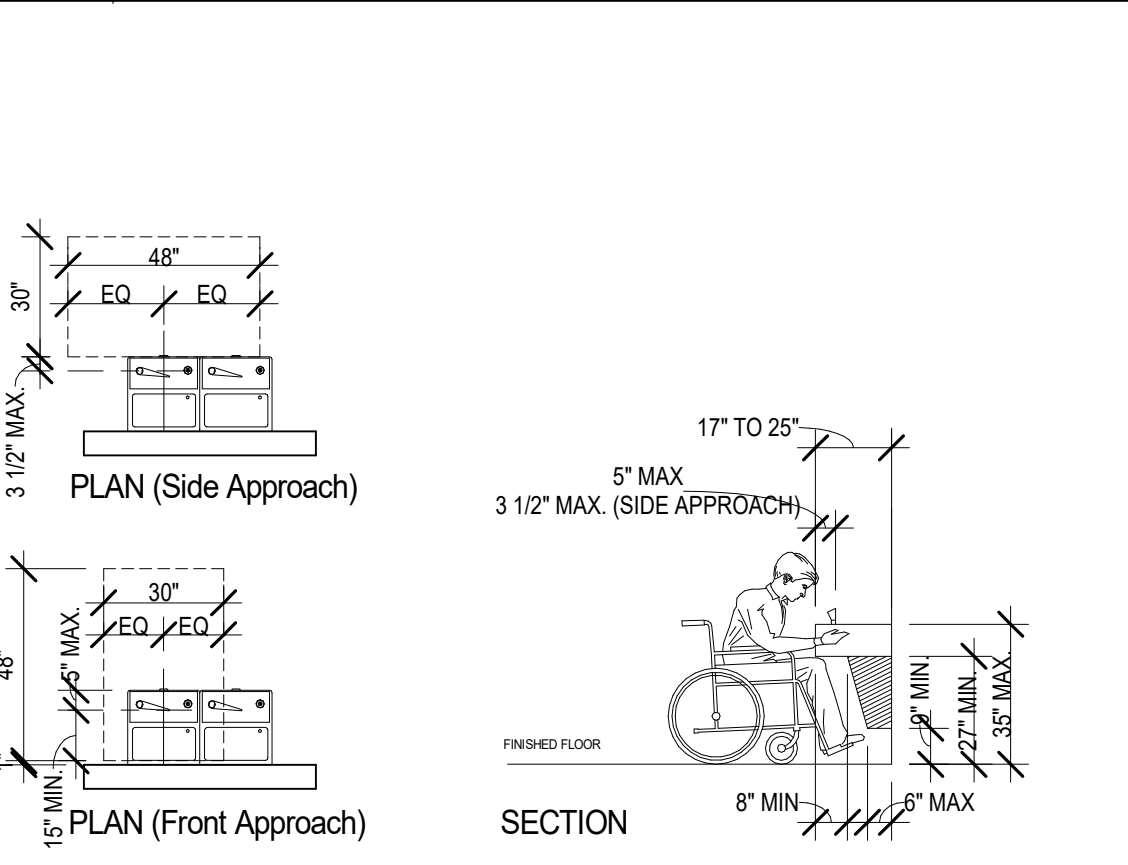
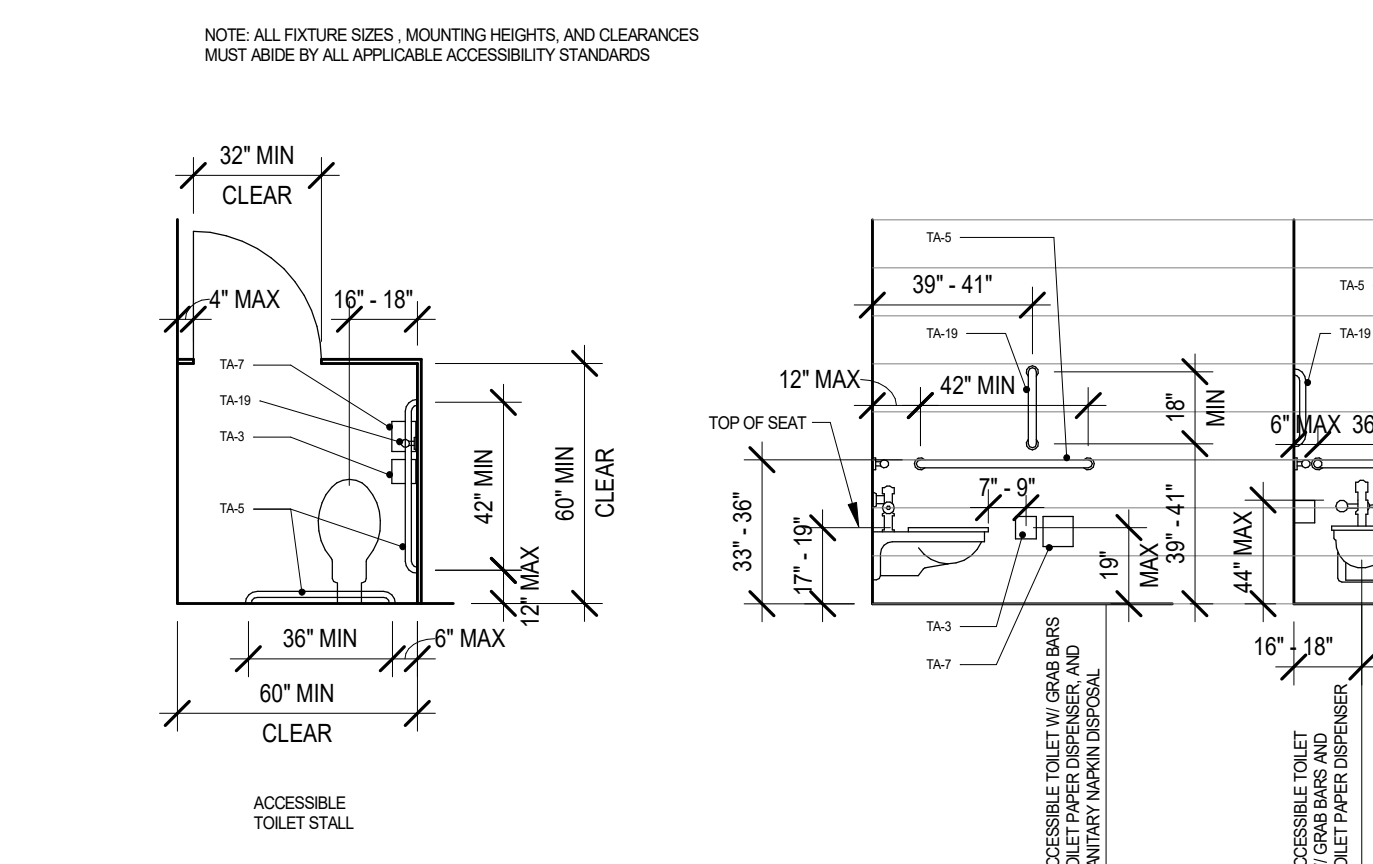
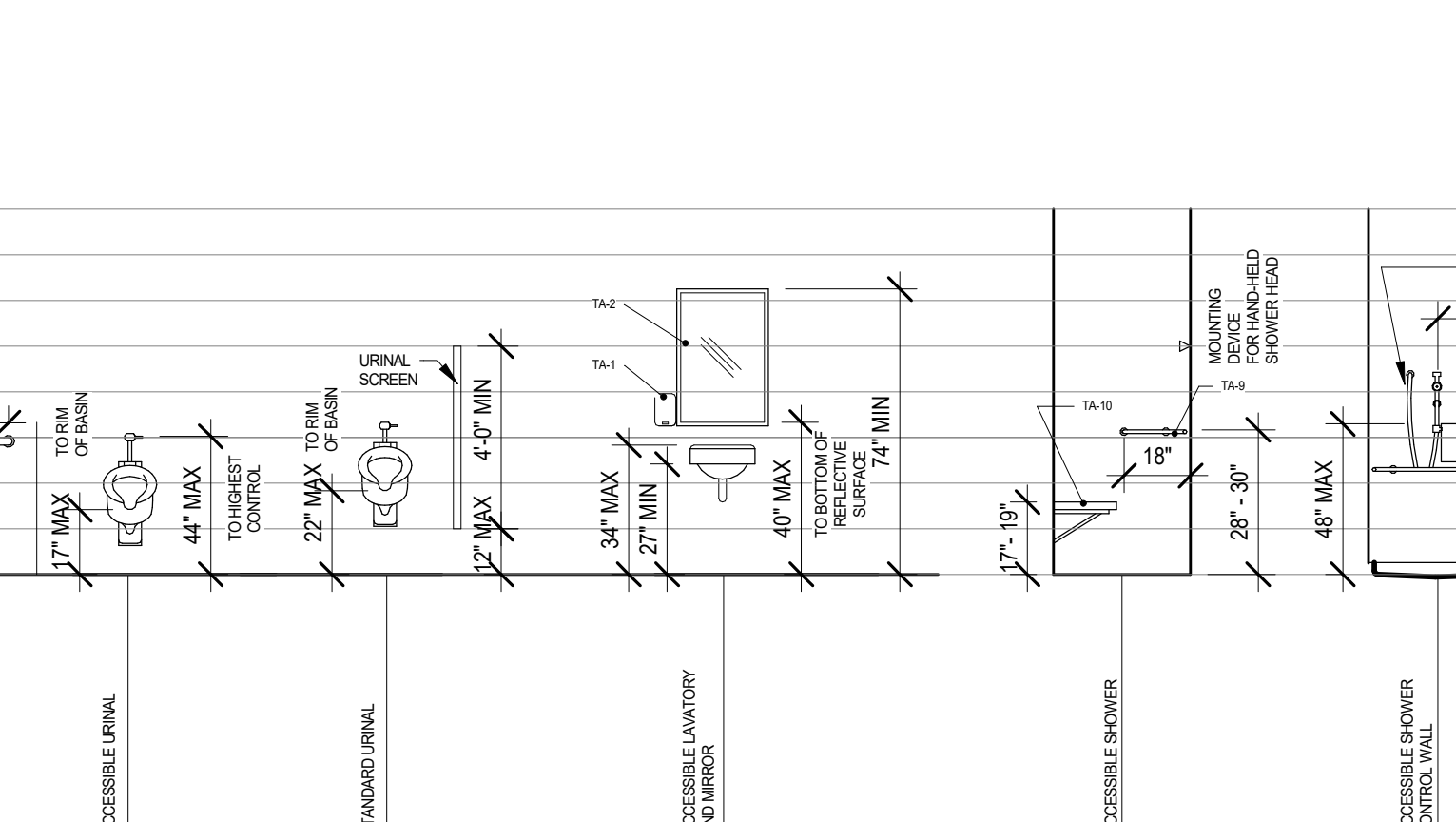
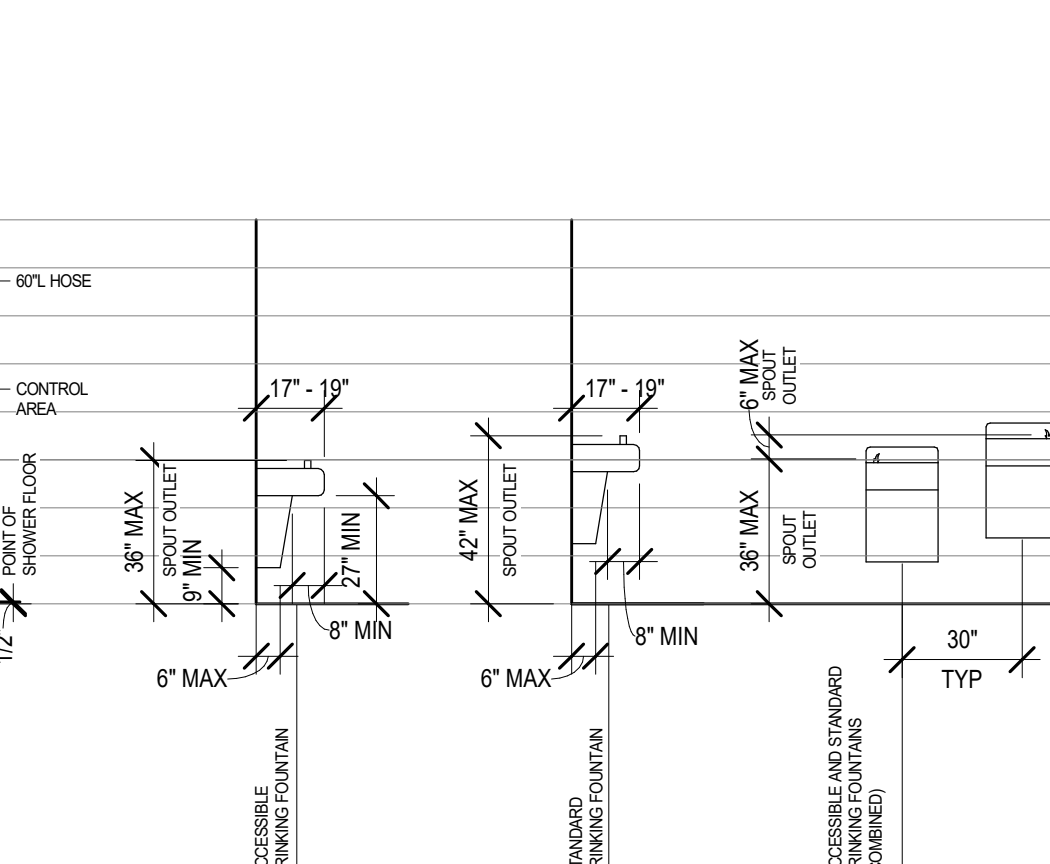
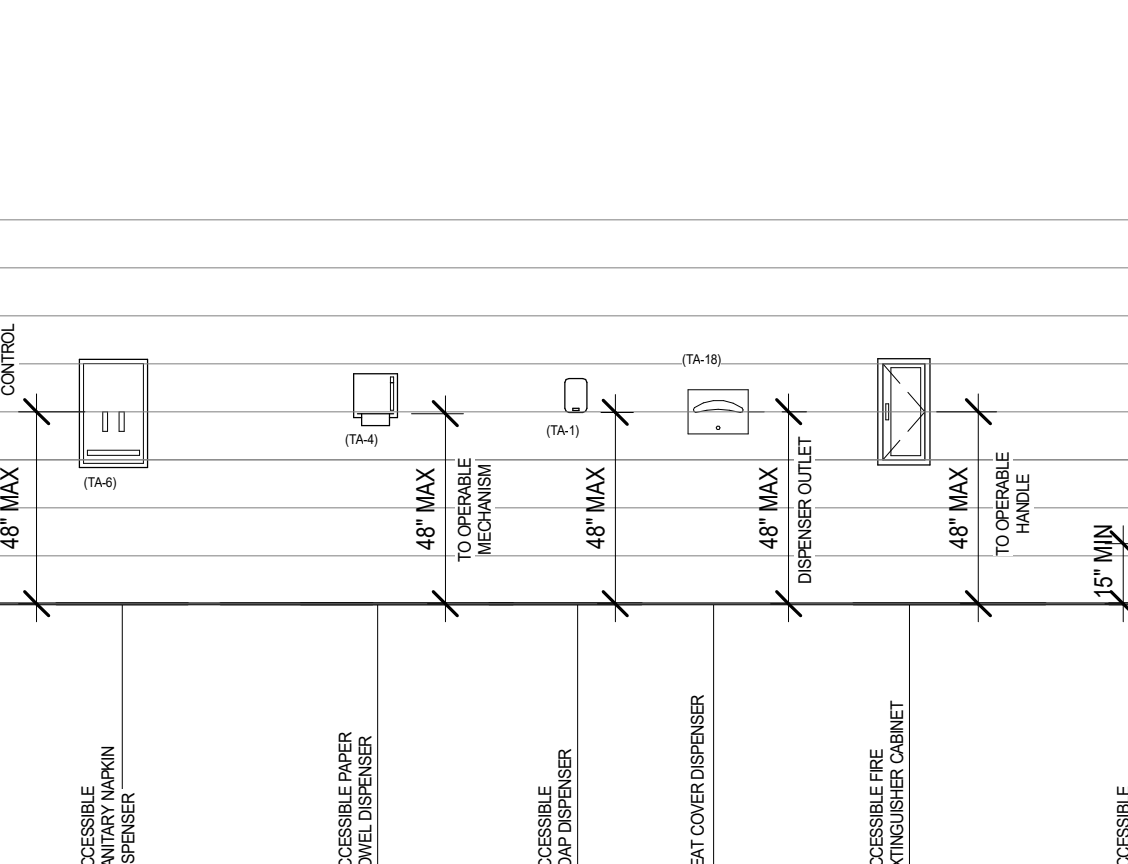
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Revisions:

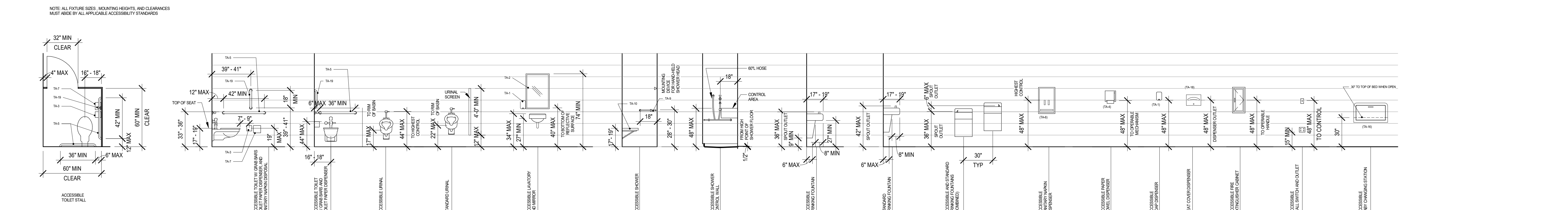
No.	Description	Date

**ACCESSIBILITY GUIDELINES**

**GO.20**

<p><b>6 ACCESSIBILITY</b> 1/4" = 1'-0"</p> 	<p><b>5 MISC MOUNTING HEIGHTS</b> 3/8" = 1'-0"</p> 	<p><b>4 ACCESSIBLE VANITY</b> 3/8" = 1'-0"</p> 	<p><b>7 TYP CUSTODIAL CLOSET</b> 1/2" = 1'-0"</p> 
<p><b>6 ACCESSIBILITY</b> 1/4" = 1'-0"</p> 	<p><b>5 MISC MOUNTING HEIGHTS</b> 3/8" = 1'-0"</p> 	<p><b>4 ACCESSIBLE VANITY</b> 3/8" = 1'-0"</p> 	<p><b>3 DRINKING FOUNTAIN GUIDELINE</b> 1/4" = 1'-0"</p> 

**1 ACCESSIBILITY**  
1/4" = 1'-0"



NOTE: ALL FIXTURE SIZES, MOUNTING HEIGHTS, AND CLEARANCES MUST ABIDE BY ALL APPLICABLE ACCESSIBILITY STANDARDS.

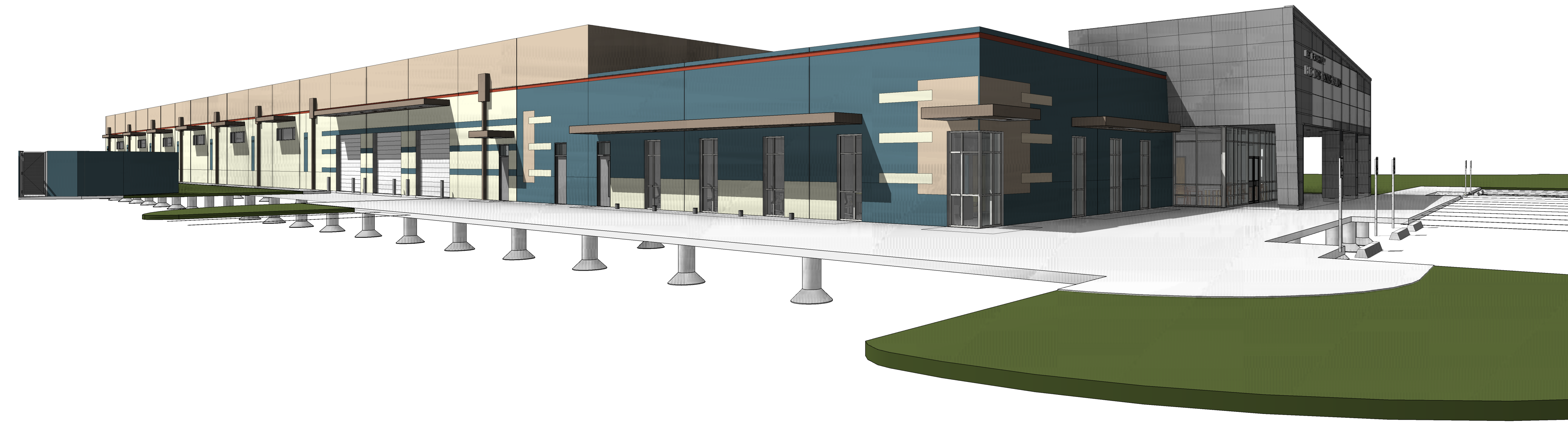


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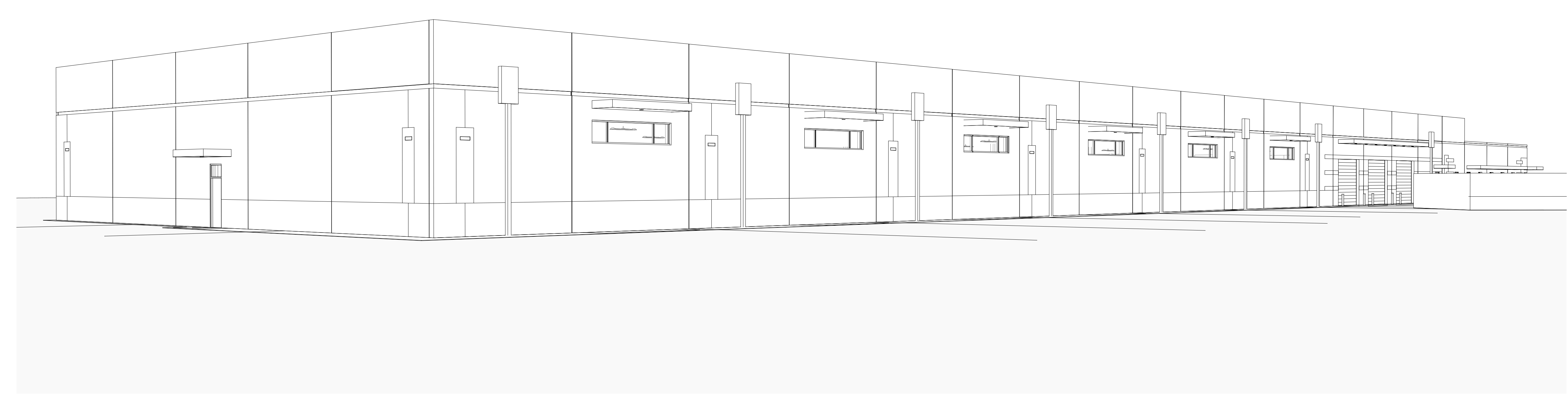
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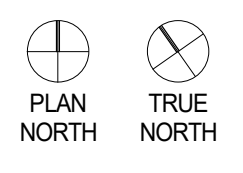
1 3D View A



2 3D View B2

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Project No.: 2330

Drawing Date: 12/07/23  
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Revisions:

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3D PERSPECTIVES

G0.40



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**FBC Elections Administration Building**

3700 BAMORE ROAD,  
ROSENBERG, TX 77471  
FOR BID AND PERMIT

Project No.: 2330

Drawing Date: 01.17.2024  
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No.	Description	Date

Revisions:

No.	Description	Date

NO SCALE  
**GENERAL NOTES**

**C0.01**

This document is for interim review only

**GENERAL NOTES**

- CONSTRUCT WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND PAVING IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, DRAWINGS AND CONSTRUCTION DETAILS.
- THE GEOTECHNICAL INVESTIGATION AND SOILS REPORT WAS PREPARED BY **QC LABORATORIES, INC.**, PROJECT NO. 17G14478, DATED **MARCH 23, 2018**, OR AS AMENDED.
- UTILITIES PRESENTED ON THESE DRAWINGS ARE SHOWN BASED ON THE BEST AVAILABLE INFORMATION. CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS IN THE FIELD PRIOR TO COMMENCING CONSTRUCTION. CONTRACTOR SHALL NOTIFY TEXAS ONE CALL AT 713-223-4567/811 OR 800-344-5377 AND LONE STAR NOTIFICATION CENTER AT 800-669-8344 AT LEAST 48 HOURS BEFORE PROCEEDING WITH ANY EXCAVATION. UTILITIES MARKED WITHIN THE PUBLIC RIGHT OF WAY OR IN EASEMENTS SHALL COMPLY WITH TAC TITLE 16, PART 1, CHAPTER 18, RULE §18.6 AND THE AMERICAN PUBLIC WORKS ADMINISTRATION (APWA) UNIFORM COLOR CODE. REFER TOPOGRAPHIC AND SUE SURVEY SHEET C-100.2.
- CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO EXISTING WATER, WASTEWATER, STORM WATER LINES AND TRAFFIC CONTROL DEVICES. DAMAGES SHALL BE REPAIRED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AT NO ADDITIONAL COST.
- ADEQUATE POSITIVE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND ANY DRAINAGE DITCH OR STRUCTURE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO EXISTING CONDITIONS OR BETTER.
- CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT ROOT SYSTEMS OF SHRUBS, PLANTS AND TREES NOT REMOVED AND WITHIN THE LIMITS OF WORK
- CONTRACTOR SHALL COMPLY WITH LATEST EDITION OF OSHA REGULATIONS AND THE STATE OF TEXAS LAWS CONCERNING EXCAVATION.
- CONTRACTOR SHALL MAINTAIN A SET OF REDLINE DRAWINGS AND RECORD AS-BUILT CONDITIONS DURING CONSTRUCTION. THESE REDLINE MARKED UP DRAWINGS WILL BE SUBMITTED TO THE DESIGN CONSULTANT WHO WILL MAKE THE CHANGES ON "RECORD DRAWINGS", TRACINGS, LABEL EACH SHEET IN THE SET AS "RECORD DRAWINGS", AND RETURN IT TO THE HOUSTON AIRPORT SYSTEM.
- CONTRACTOR TO OBTAIN ALL FEDERAL, STATE AND MUNICIPAL DEVELOPMENT AND CONSTRUCTION PERMITS REQUIRED AT HIS EXPENSE PRIOR TO COMMENCEMENT OF WORK.

**SWPPP CONSTRUCTION NOTES**

- CONTRACTOR SHALL IMPLEMENT INLET PROTECTION DEVICES AND REINFORCED FILTER FABRIC BARRIER ALONG ROAD AND SIDE DITCHES AT LOCATIONS SHOWN ON THE TYPICAL STORM WATER POLLUTION PREVENTION (SWPP) PLANS TO KEEP SILT AND OR EXCAVATED MATERIALS FROM ENTERING INTO THE STORM WATER INLETS AND DITCHES EVENTUALLY POLLUTING THE RECEIVING STORM.
- DURING THE EXCAVATION PHASE OF THE PROJECT, CONTRACTOR SHALL SCHEDULE THE WORK IN SHORT SEGMENTS SO THAT EXCAVATION MATERIAL CAN BE QUICKLY HAULLED AWAY FROM THE SITE AND TO PREVENT IT FROM STAYING UNCOLLECTED ON THE EXISTING PAVEMENT. ANY LOOSE EXCAVATED MATERIAL WHICH FALLS ON PAVEMENTS OR DRIVEWAYS SHALL BE SWEEP BACK INTO THE EXCAVATED AREA.
- CONTRACTOR SHALL CLEAN UP THE EXISTING STREET INTERSECTIONS AND DRIVEWAYS DAILY, AS NECESSARY, TO REMOVE ANY EXCESS MUD, SILT OR ROCK TRACKED FROM THE EXCAVATED AREA.
- CONTRACTOR SHALL FOLLOW GOOD HOUSEKEEPING PRACTICES DURING THE CONSTRUCTION OF THE PROJECT, ALWAYS CLEANING UP DIRT AND LOOSE MATERIAL AS CONSTRUCTION PROGRESSES.  
-LOOSE SOIL TO BE SPRINKLED TO PREVENT BLOWING AWAY BY WIND.  
-USE OF SILT FENCES AROUND CONSTRUCTION SITE.  
-HYDRO-MULCH OR SEEDING TO BE PERFORMED AS NEEDED TO PREVENT EROSION.
- CONTRACTOR TO INSPECT AND MAINTAIN THE AREAS LISTED BELOW AT LEAST ONCE EVERY FOURTEEN (14) CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM EVENT OF 0.5 INCHES OR GREATER.  
-DISTURBED AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN FINAL STABILIZED.  
-AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION.  
-STRUCTURAL CONTROL MEASURES.  
-LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE.
- CONTRACTOR TO BE RESPONSIBLE TO MAINTAIN EXISTING DITCHES AND/OR CULVERTS FOR UNOBSERVED DRAINAGE AT ALL TIMES. WHERE SODDING IS DISTURBED BY EXCAVATION OR BACKFILLING OPERATIONS, SUCH AREAS SHALL BE REPLACED BY SEEDING OR SODDING. SLOPES 4:1 OR STEEPER SHALL BE REPLACED BY BLOCK SODDING.

**GRADING NOTES**

- GENERAL CONTRACTOR AND ALL SUBCONTRACTORS SHALL VERIFY THE SUITABILITY OF ALL EXISTING AND PROPOSED SITE CONDITIONS INCLUDING GRADES AND DIMENSIONS BEFORE STARTING 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 POONDING IN PAVED AREAS, AND SHALL NOTIFY ENGINEER IF ANY DISCREPANCIES ARE FOUND IN THE EXISTING AND PROPOSED GRADES PRIOR TO PLACEMENT OF PAVEMENT OR UTILITIES.
- CONTRACTOR SHALL PROTECT ALL MANHOLES COVERS, VALVE COVERS, VAULT LIDS, FIRE HYDRANTS, POWER POLES, GUY WIRES, AND TELEPHONE BOXES THAT ARE TO REMAIN IN PLACE AND UNDISTURBED DURING CONSTRUCTION.
- EXISTING CONCRETE PAVING, SIDEWALK, AND CURB DEMOLITION SHALL BE REMOVED AS CALLED OUT ON PLANS AND DISPOSED OF BY CONTRACTOR. DISPOSAL SHALL BE AT AN APPROVED OFF-SITE, LAWFUL LOCATION, UNLESS DIRECTED OTHERWISE BY OWNER.

**WATER CONSTRUCTION NOTES**

- WATER LINES SHALL BE CONSTRUCTED AS DESIGNED IN ACCORDANCE WITH THE LATEST CITY OF ROSENBERG DESIGN MANUAL, PROJECT SPECIFICATION, AND CONSTRUCTION DETAILS.
- ALL 4" THROUGH 12" WATER LINE TO BE AWWA C900 PVC CLASS 235, DR-18 BLUE PRESSURE RATED WATER MAIN WITH 1" THRU 3" WATER SERVICE LINE TO BE PVC PRESSURE PIPE CONFORM TO ASTM D 1785 OR CONTINUOUS TYPE K COPPER TUBING PER CITY OF ROSENBERG SPECIFICATIONS. ALL 4" THRU 54" DI PIPE WATER LINES SHALL BE AWWA

C151 WITH INSIDE LINING WITH AWWA C104 AND DOUBLE WRAPPED WITH 8-MIL POLYETHYLENE SHEETS.

- CONCRETE THRUST BLOCKS SHALL BE PROVIDED AS NECESSARY TO PREVENT PIPE MOVEMENT.
- ALL WATER LINES UNDER PROPOSED OR FUTURE PAVING AND TO A POINT OF 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 WITHIN ONE (1) FOOT OF SUBGRADE.
- ALL WATER LINE AND SEWER LINE CROSSINGS SHALL BE CONSTRUCTED PER CITY OF ROSENBERG AND TCEQ REGULATIONS.
- ALL WATER VALVES SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF AWWA C-509 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 EVERY 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.
- 3" 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 PROJECT SPECIFICATIONS. TESTS ARE TO BE PERFORMED ON THE ENTIRE FOOTAGE OF WATER PIPE LINE INCLUDED IN THE PROJECT.
- ALL WATER LINES TO HAVE 4' MINIMUM COVER TO FINISHED GRADE AND MINIMUM 12" CLEARANCE TO OTHER UTILITIES AT CROSSINGS UNLESS OTHERWISE NOTED ON PLANS. ALL WATER LINE INSTALLED OVER 8' DEEP SHALL UTILIZE RESTRAINED JOINT FITTINGS.

**SANITARY SEWER CONSTRUCTION NOTES**

- ALL SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND BE SUBJECT TO A STANDARD EXFILTRATION TEST. 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 DOMESTIC WASTEWATER SYSTEMS SHALL GOVERN WHERE CONFLICTS EXIST EXCEPT WHERE PROJECT REQUIREMENTS ARE MORE STRINGENT.
- ALL MANHOLES ARE TO BE PER CITY OF ROSENBERG STANDARD DETAILS.
- SANITARY SEWER MANHOLES WILL HAVE BEDDING AND BACKFILL PER CITY OF ROSENBERG STANDARD DETAILS UNLESS OTHERWISE NOTED.
- THE SANITARY SEWER PVC PIPE SHALL BE ASTM D 3034, TYPE PSM SDR 26 GRAVITY SEWER PIPE, ASTM D2241 SDR 26 PRESSURE RATED SEWER PIPE OR AWWA C-900 DR-18 GREEN PVC PRESSURE RATED SEWER PIPE BASED ON CONSTRUCTION CONDITION REQUIREMENT AND CONFORMING TO ASTM D1784 AND PROJECT SPECIFICATION SECTION 33 12 00 POLYVINYL CHLORIDE PIPE. ALL LATERALS TO MAIN CONNECTIONS SHALL BE MADE AT A MANHOLE.
- WHEN SS PRESSURE RATED PVC PIPE IS USED ON WATERLINE (WL) CROSSING UNDER CONDITION 1 OF COH IDM TABLE 7.3, THE SAME TYPE OF D2241 SDR 26 PVC PIPE OR C-900 GREEN DR-18 PVC GREEN PRESSURED TO BE UTILIZING IN-BETWEEN TWO SS MH'S. OR TO UTILIZE A DI TRANSITION ADAPTER FOR THE CONNECTING OF ASTM D-3034 PVC GRAVITY PIPE TO DI-OD AWWA C-900 PVC PIPE CENTERED AT WL WHEN CONNECTING TWO DIFFERENT TYPES OF PVC PIPES FOR SEWER CONSTRUCTION.
- AWWA C-900 DR-18 PVC PIPE USES EITHER AWWA C900 DR-18 PVC FITTINGS OR DIP FITTINGS.
- ALL SANITARY SEWER LINES UNDER PROPOSED OR FUTURE PAVEMENT SHALL HAVE BEDDING PER CITY OF ROSENBERG STANDARD DETAILS.
- ALL SANITARY SEWERS CROSSING WATER LINES WITH A CLEARANCE BETWEEN 12 INCHES AND 9 FEET SHALL HAVE A MINIMUM OF ONE 18' JOINT OF 150 PSI DUCTILE IRON OR (GREEN) C900 PVC PIPE MEETING ASTM SPECIFICATION D2241 CENTERED ON WATER LINE. WHEN WATER LINE IS BELOW SANITARY SEWER PROVIDE MINIMUM 2 FOOT SEPARATION.
- CONTRACTOR SHALL PROVIDE A MINIMUM HORIZONTAL CLEARANCE OF 9' FEET BETWEEN WATER LINES AND SANITARY SEWER MANHOLES AND LINES.
- SANITARY SEWER MANHOLE RIMS OUTSIDE OF PROPOSED PAVING WILL BE SET 3" - 6" ABOVE THE SURROUNDING LEVEL FINISHED GRADE AFTER PAVING WITH SLOPED BACKFILL ADDED FOR STORM WATER TO DRAIN AWAY FROM MANHOLE RIM.
- IN WET STABLE TRENCH AREAS USE BEDDING PER CITY OF HOUSTON STANDARD DETAILS DRAWING NUMBER 02317-02.
- DEFLECTION TEST: DEFLECTION TESTS SHALL BE PERFORMED ON ALL FLEXIBLE AND SEMI-RIGID SEWER PIPE. THE TEST SHALL BE CONDUCTED AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS. NO PIPE SHALL EXCEED A DEFLECTION OF 5% IF THE DEFLECTION TEST IS TO BE RUN USING A RIGID MANDREL, IT SHALL HAVE A DIAMETER EQUAL TO 96% OF THE INSIDE DIAMETER OF THE PIPE. THE TEST SHALL BE PERFORMED AS PER 30 TAC 317.2 LATEST AMENDMENT AND WITHOUT MECHANICAL PULLING DEVICES. NO BALL-TYPE MANDREL IS ALLOWED.
- INFILTRATION, EXFILTRATION OR LOW-PRESSURE AIR TEST: EITHER OF THE FOLLOWING TESTS SHALL BE PERFORMED AS PER TAC TITLE 30 317.2 WITHIN THE SPECIFIED TOLERANCES ON ALL GRAVITY SEWERS.

A. INFILTRATION OR EXFILTRATION TEST: TOTAL LEAKAGE AS DETERMINED BY A HYDROSTATIC HEAD TEST SHALL NOT EXCEED 50 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOURS AT A MINIMUM TEST HEAD

OF TWO (2) FEET.

B. LOW-PRESSURE AIR TEST: PERFORM TEST ACCORDING TO UNI-B-6-90 OR OTHER APPROPRIATE PROCEDURES. FOR SECTIONS OF PIPE LESS THAN 36" (INCH) AVERAGE INSIDE DIAMETER, THE MINIMUM ALLOWABLE TIME FOR PRESSURE DROP FROM 3.5 P.S.I.G. TO 2.5 P.S.I.G. SHALL BE AS FOLLOWS:

- 6" 340 SECONDS OR 0.855(L) FOR TEST LENGTHS GREATER THAN 398'
  - 8" 454 SECONDS OR 1.520(L) FOR TEST LENGTHS GREATER THAN 298'
  - 10" 567 SECONDS OR 2.374(L) FOR TEST LENGTHS GREATER THAN 239'
  - 15" 850 SECONDS OR 5.342(L) FOR TEST LENGTHS GREATER THAN 159'
  - 18" 1020 SECONDS OR 7.693(L) FOR TEST LENGTHS GREATER THAN 133'
- WHERE L = LENGTH OF LINE OF SAME PIPE SIZE IN FEET.

**CENTERPOINT ENERGY NOTES**

- CAUTION: UNDERGROUND GAS FACILITIES**
- THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT 1-800-545-6005 OR 811 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.  
-WHEN CENTERPOINT ENERGY PIPE LINE MARKINGS ARE NOT VISIBLE, CALL 713-207-5463 OR 713-945-8037 (7:00 AM TO 4:30 PM) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.  
-WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF CENTERPOINT ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES.  
-WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.  
-FOR EMERGENCIES REGARDING GAS LINES CALL 713-659-3552 OR 713-207-4200
  - THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES.

**WARNING: OVERHEAD ELECTRICAL LINES**

- OVERHEAD LINES MAY EXIST ON THE PROPERTY. THE LOCATION OF OVERHEAD LINES HAS NOT BEEN SHOWN ON THESE DRAWINGS AS THE LINES ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAW, SECTION 752, HEALTH & SAFETY CODE FORBIDS ACTIVITIES THAT OCCUR IN CLOSE PROXIMITY TO HIGH VOLTAGE LINES, SPECIFICALLY:  
-ANY ACTIVITY WHERE PERSONS OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES; AND  
-OPERATING A CRANE, DERRICK, POWER SHOVEL, DRILLING RIG, PILE DRIVER, HOISTING EQUIPMENT, OR SIMILAR APPARATUS WITHIN 10 FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES.
- PARTIES RESPONSIBLE FOR THE WORK, INCLUDING CONTRACTORS, ARE LEGALLY RESPONSIBLE FOR THE SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. THIS LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY. TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED CALL CENTERPOINT ENERGY AT 713-207-2222.

**ACTIVITIES ON/OR ACROSS CENTERPOINT ENERGY FEE OR EASEMENT PROPERTY**

- NO APPROVAL TO USE, CROSS, OR OCCUPY CENTERPOINT FEE OR EASEMENT PROPERTY IS GIVEN. IF YOU NEED TO USE CENTERPOINT PROPERTY, PLEASE CONTACT OUR SURVEYING AND RIGHT OF WAY DIVISION AT (713)207-6348 OR (713)207-5769.



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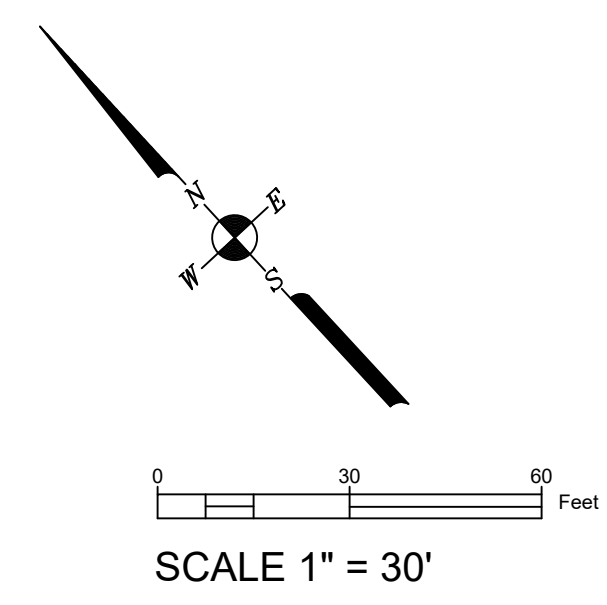
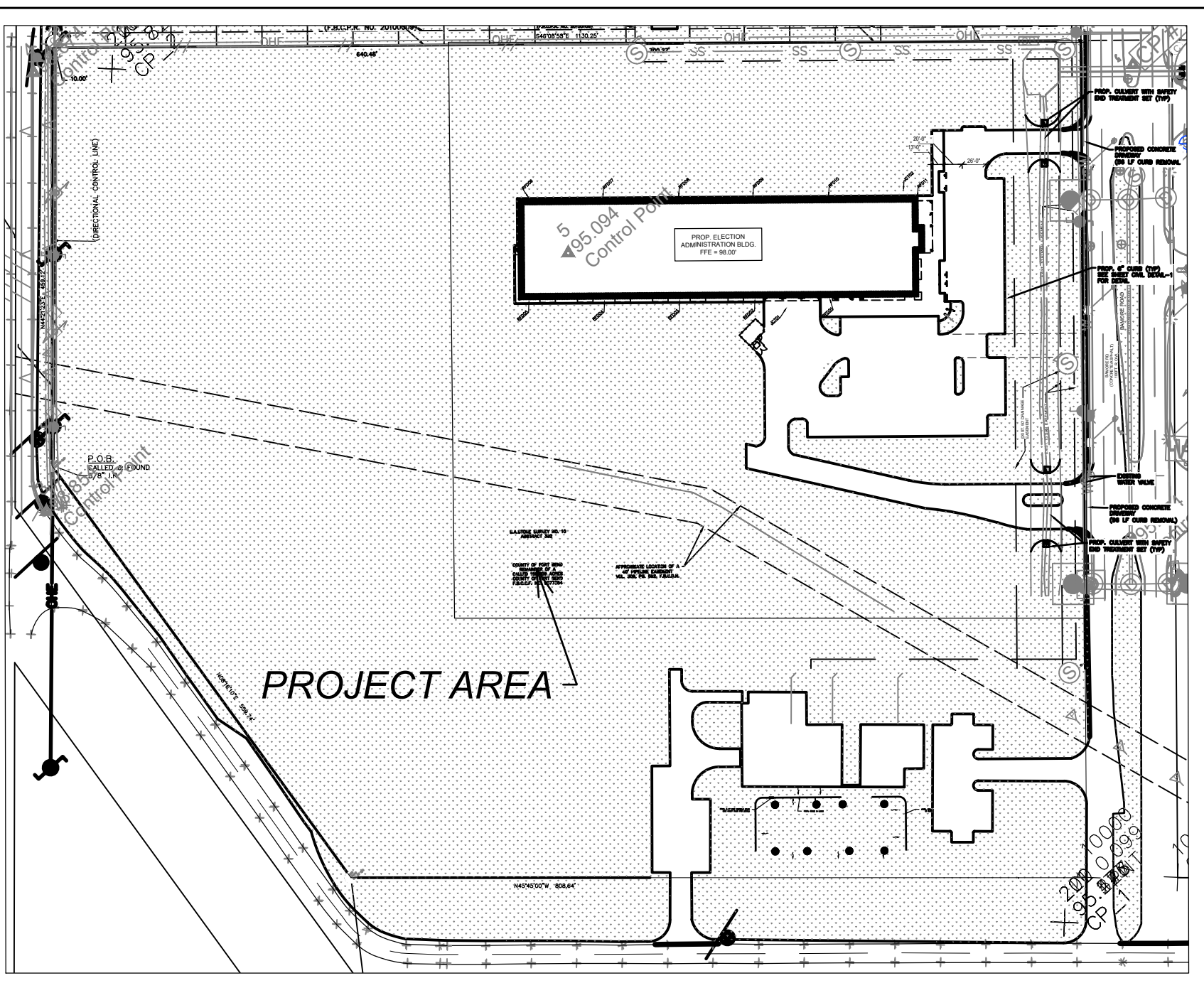
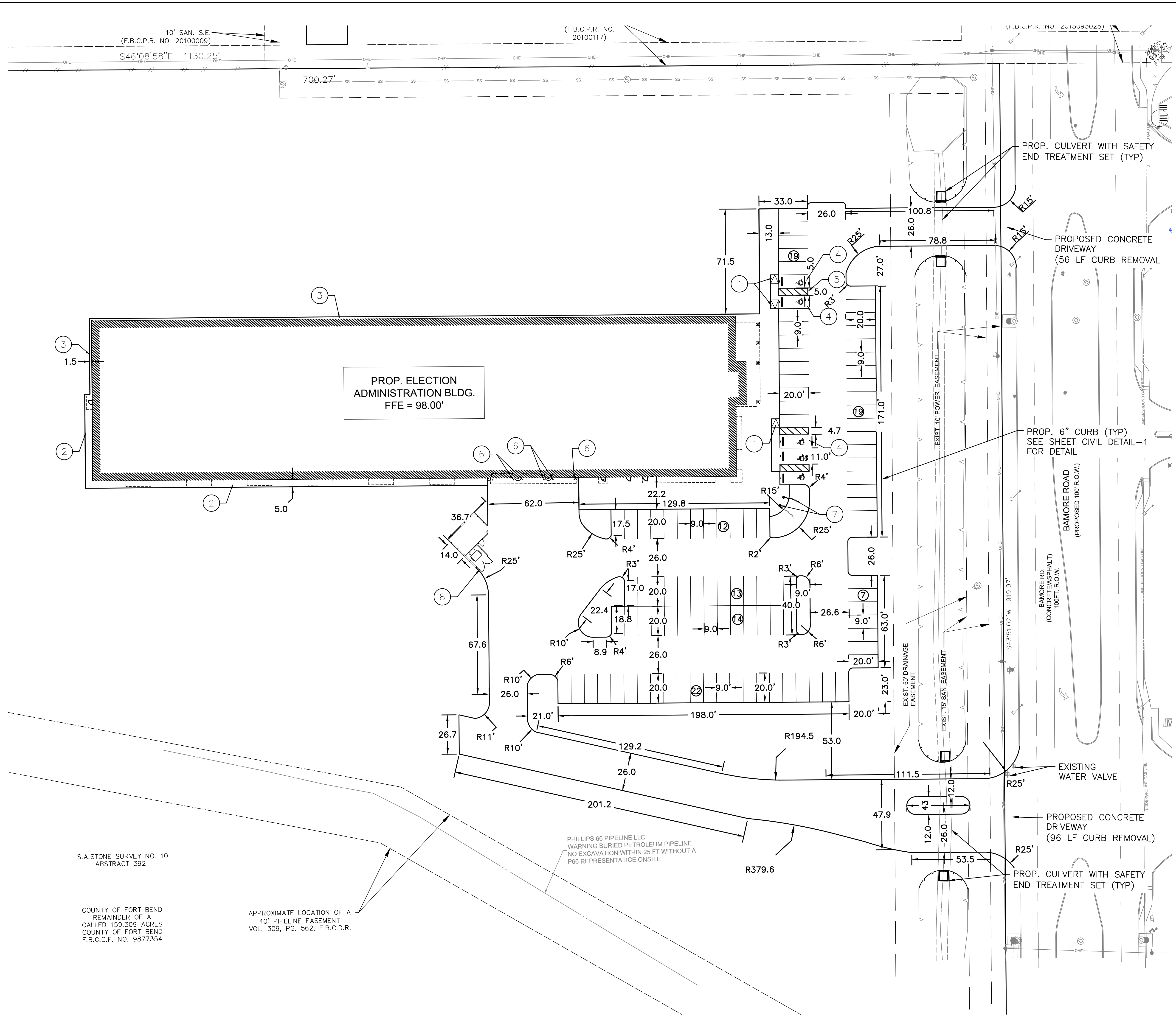
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**FBC Elections Administration Building**

3700 BAMORE ROAD,  
ROSENBERG, TX. 77471  
FOR BID AND PERMIT



**FLOODPLAIN INFORMATION**  
THIS TRACT LIES IN ZONE "X". AS PER THE NATIONAL FLOOD INSURANCE PROGRAM FIRM FOR FORT BEND COUNTY, TEXAS, COMMUNITY NO. 480228, PANEL NUMBER 0240L, MAP NUMBER 48157C0240L, LATEST AVAILABLE PUBLISHED REVISION DATED APRIL 2, 2014.

**BENCHMARK INFORMATION**  
A BRASS DISK (NGS MONUMENT M1219) LOCATED ON THE TOP AND 0.6' SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL OF A 5-CHANNEL CULVERT, APPROXIMATELY 25' EAST OF THE CENTERLINE OF STATE HIGHWAY 36, APPROXIMATELY 0.45 MILE NORTH OF THE JUNCTION OF BAND ROAD.  
ELEVATION = 94.48', NAVD 1988, 2001 ADJUSTMENT

**EXIST LEGEND:**

	PROPERTY LINE
	DITCH FLOWLINE
	WATERLINE
	UTILITY EASEMENT
	OVERHEAD POWER LINE
	SANITARY SEWER
	BUILDING LINE
	SANITARY MANHOLE
	STORM MANHOLE
	POWER POLE

- KEY NOTES**
- 1 PROPOSED A.D.A. RAMP
  - 2 PROPOSED SIDEWALK
  - 3 PROPOSED 1.5-FT MOW STRIP
  - 4 PROPOSED HANDICAP SIGN. SEE SHEET 5.04 FOR DETAIL
  - 5 PROPOSED PARKING STRIPING.
  - 6 PROPOSED BOLLARD. REF. TO ARCHITECTURAL PLANS
  - 7 PROPOSED FLAG POLE. REF. TO ARCHITECTURAL PLANS
  - 8 PROPOSED DUMPSTER AREA. REF. TO S403 STRUCTURAL PLANS

Project No.: 2330  
Drawing Date: 01.17.2024  
Drawn: RR  
Checked: DM  
Scale: AS NOTED

**Issue Log:**

No.	Descriptor	Date

**Revisions:**

No.	Description	Date

1" = 30'-0"  
**CIVIL SITE PLAN**  
**C1.00**

This document is for interim review only

S.A.STONE SURVEY NO. 10  
ABSTRACT 392  
  
COUNTY OF FORT BEND  
REMAINDER OF A  
CALLED 159.309 ACRES  
COUNTY OF FORT BEND  
F.B.C.C.F. NO. 9877354

APPROXIMATE LOCATION OF A  
40' PIPELINE EASEMENT  
VOL. 309, PG. 562, F.B.C.D.R.

PHILLIPS 66 PIPELINE LLC  
WARNING BURIED PETROLEUM PIPELINE  
NO EXCAVATION WITHIN 25 FT WITHOUT A  
P66 REPRESENTATIVE ONSITE



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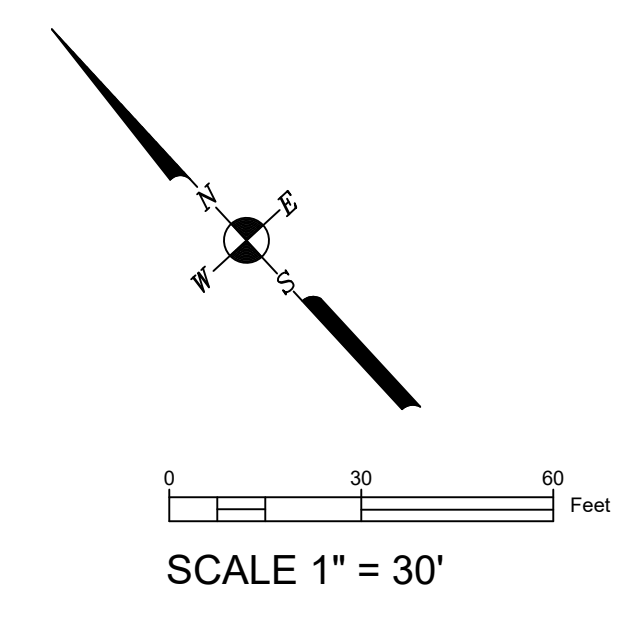
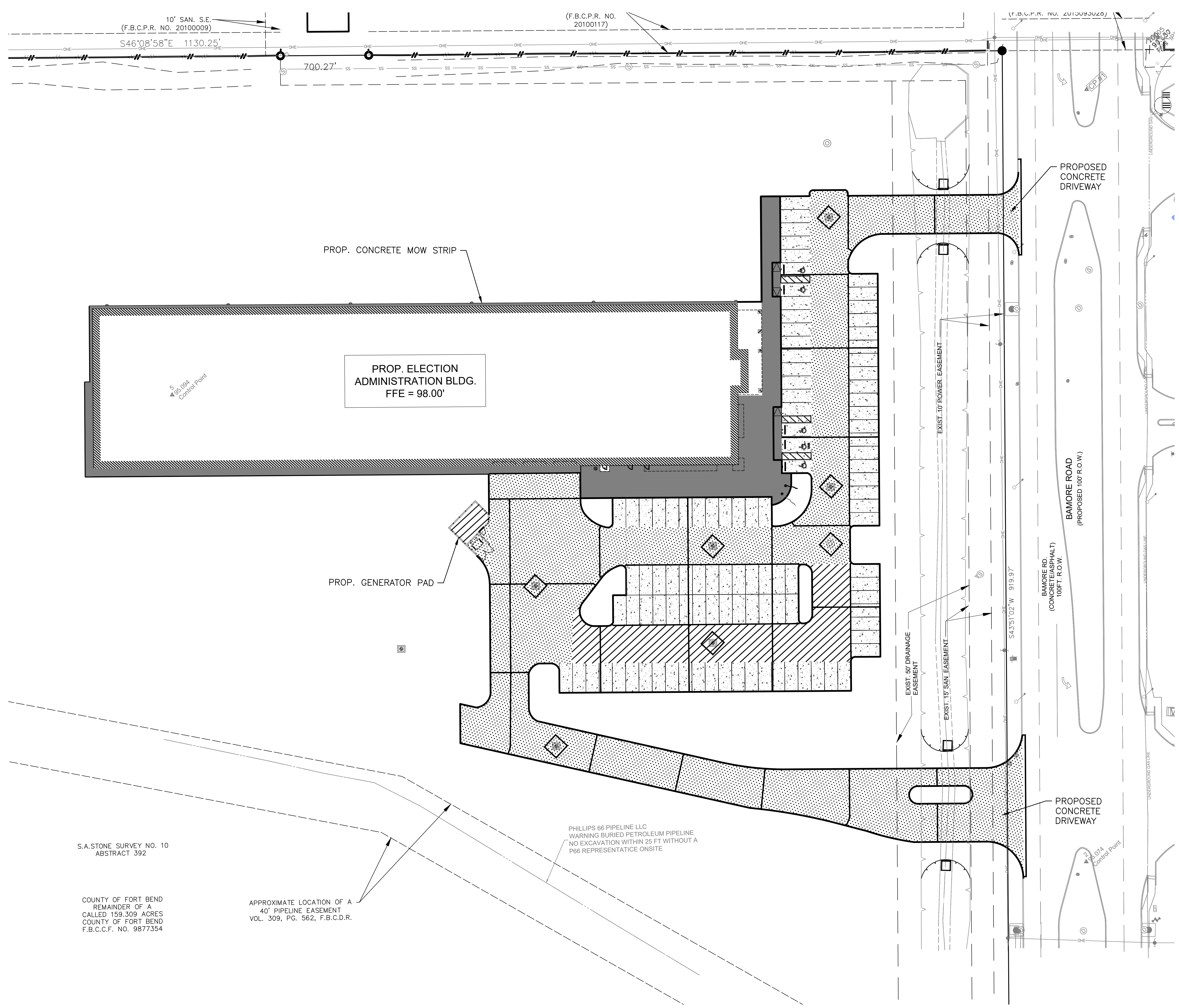
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**FLOODPLAIN INFORMATION**

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ELEVATION = 94.48', NAVD 1988, 2001 ADJUSTMENT

**PROPOSED LEGEND:**

- PROP. EXPANSION JOINTS
- PROP. CONTROL JOINTS
- PROP. ISOLATION JOINTS
- PROP. 5" CONCRETE PAVEMENT
- PROP. 6" CONCRETE PAVEMENT
- PROP. 7" CONCRETE PAVEMENT
- PROP. CONCRETE SIDEWALK

Project No.: 2330

Drawing Date: 01.17.2024  
Drawn: RR  
Checked: DM  
Scale: AS NOTED

Issue Log:

No.	Descriptor	Date

Revisions:

No.	Description	Date

1" = 30'-0"

PAVEMENT PLAN

C1.01

This document is for interim review only





01/17/2024  
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ISAN  
1981 design engineers  
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Project No.: 2330

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Issue Log

No.	Descriptor	Date

Revisions:

No.	Description	Date

1" = 40'-0"

GRADING  
PLAN

**C2.00**

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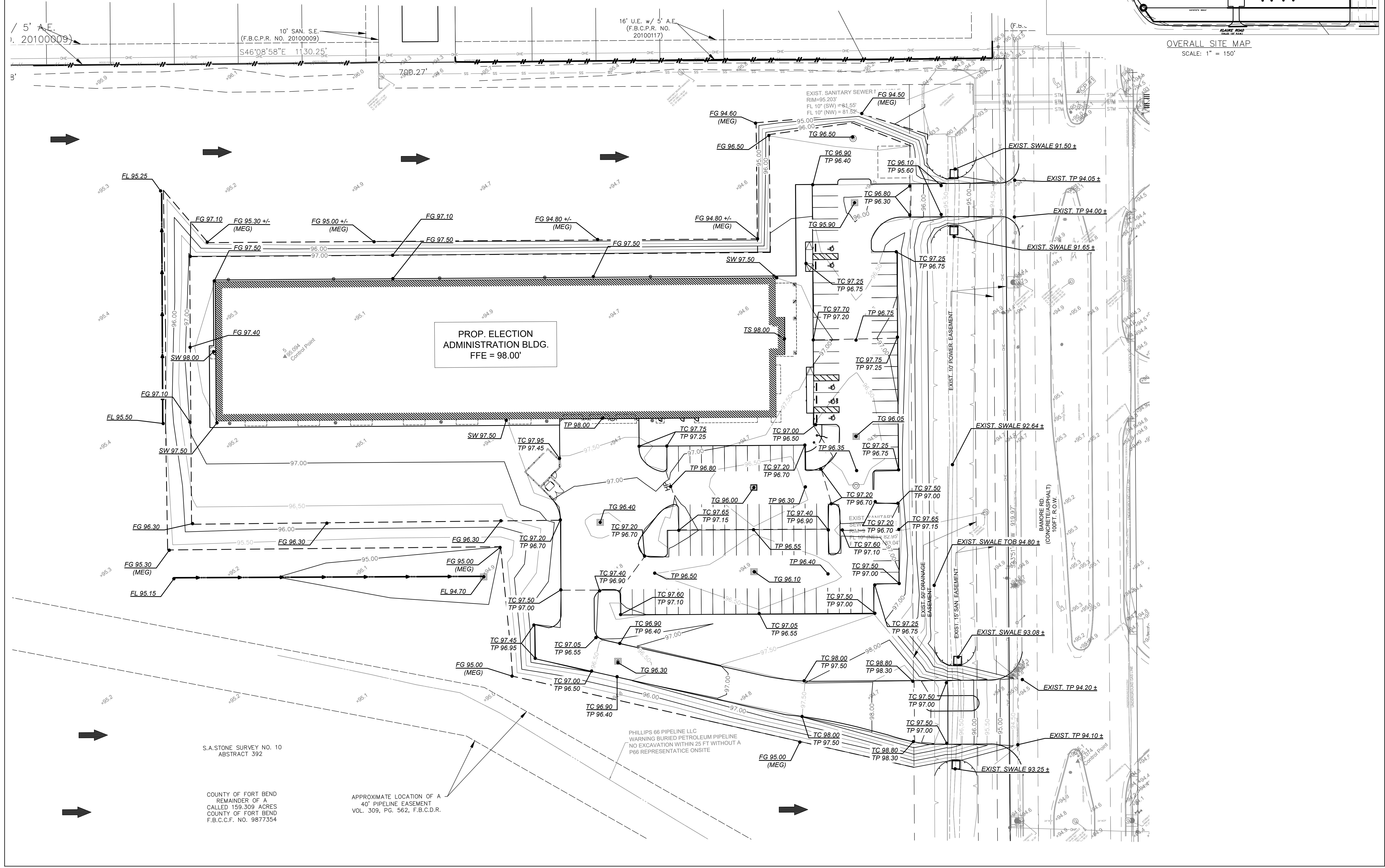
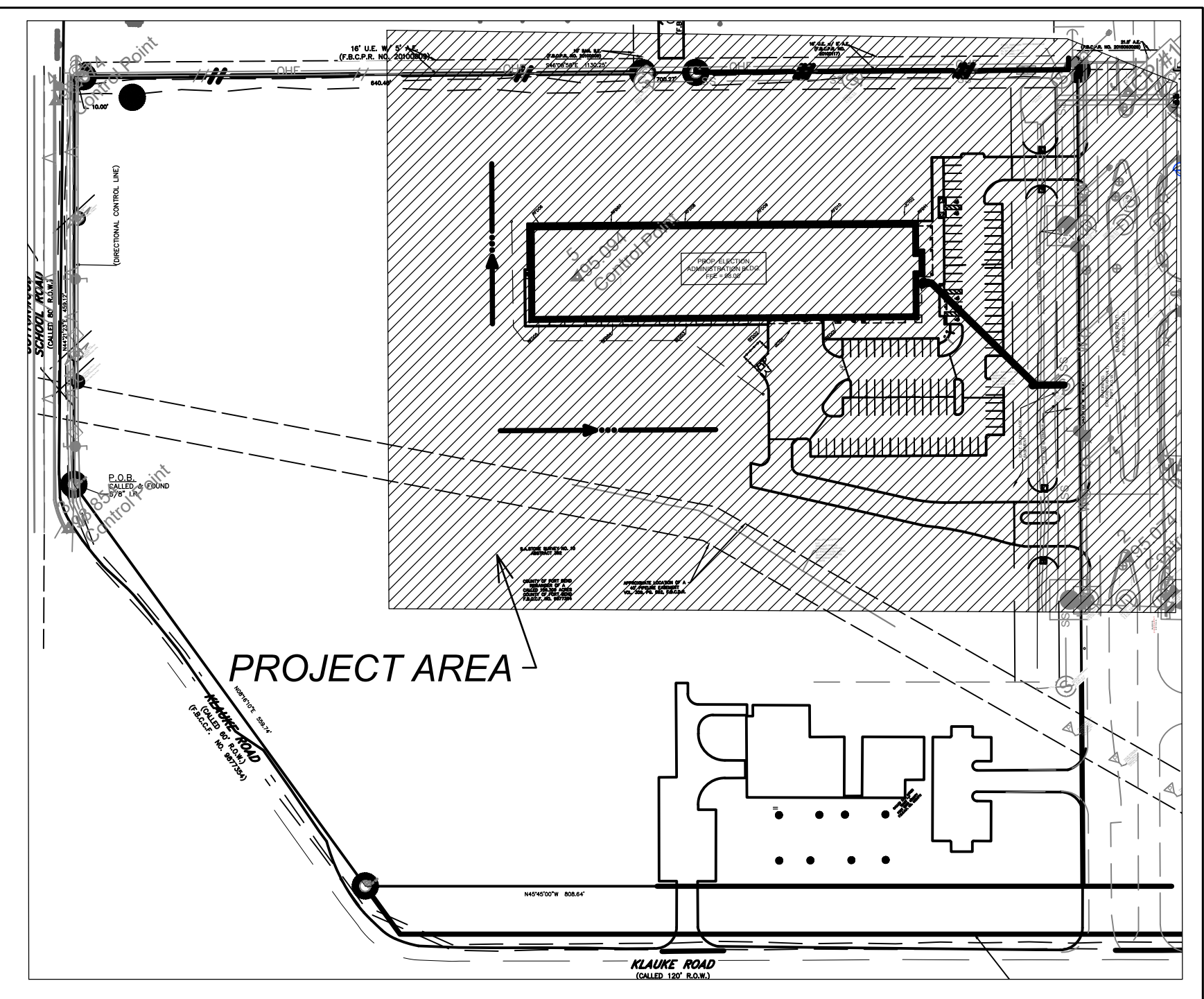
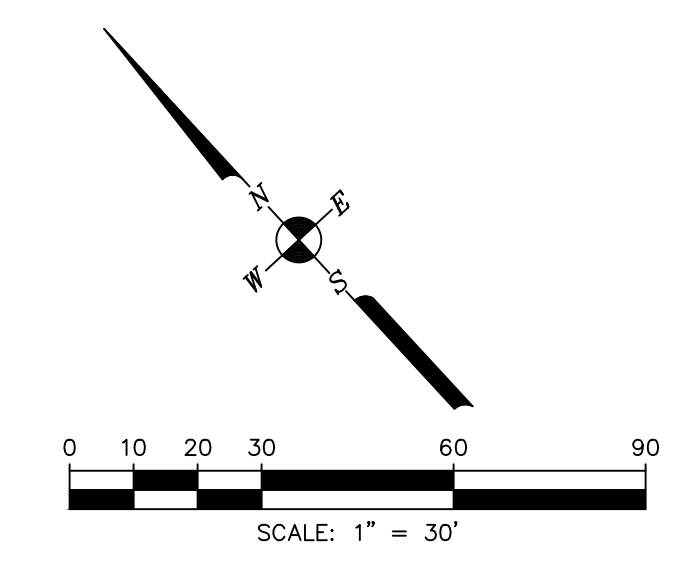
**PROPOSED LEGEND:**

- TC TOP OF CURB
- TP TOP OF PAVEMENT
- SW TOP OF SIDEWALK
- FG FINISHED GRADE
- FL FLOWLINE
- EX NG EXISTING NATURAL GROUND
- PROPOSED SHEET FLOW
- EXISTING SHEET FLOW
- - - GRADE BREAK

**FLOODPLAIN INFORMATION**  
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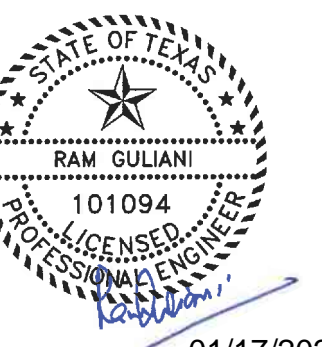


S.A. STONE SURVEY NO. 10  
ABSTRACT 392

COUNTY OF FORT BEND  
REMAINDER OF A  
CALLED 159.309 ACRES  
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F.B.C.C.F. NO. 9877354

APPROXIMATE LOCATION OF A  
40' PIPELINE EASEMENT  
VOL. 309, PG. 562, F.B.C.D.R.

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NO EXCAVATION WITHIN 25 FT WITHOUT A  
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01/17/2024

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**DRAINAGE PLAN**

**C2.01**

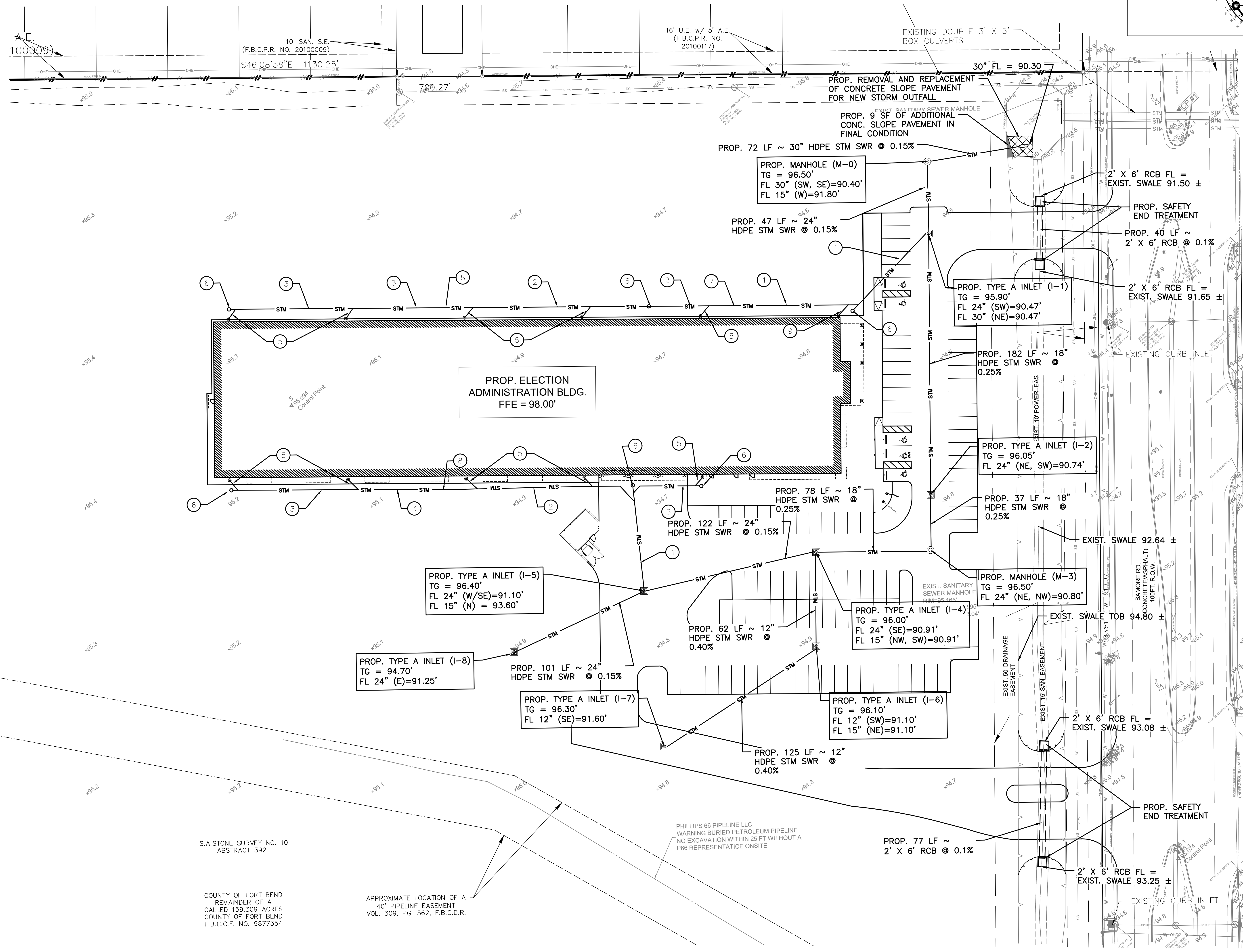
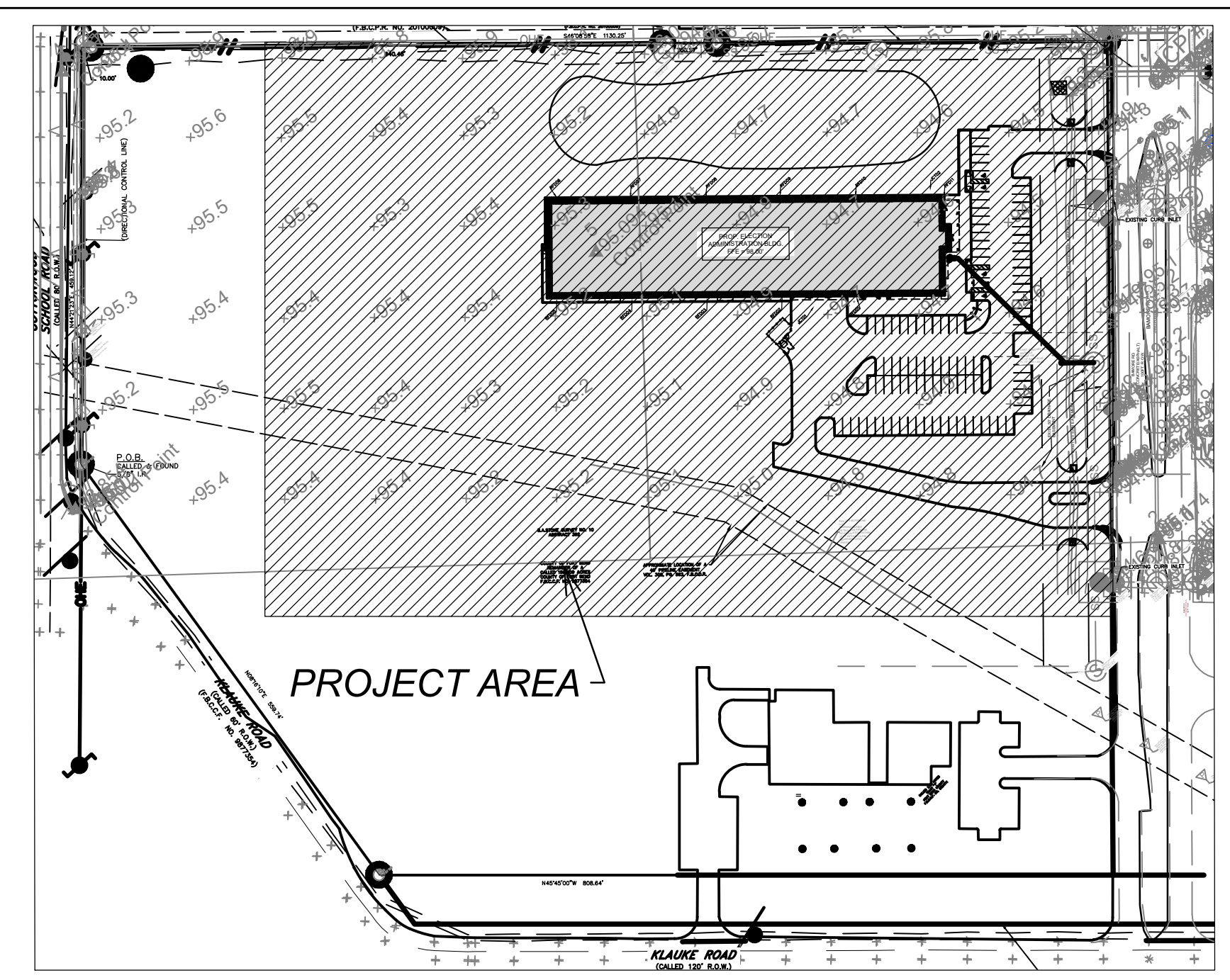
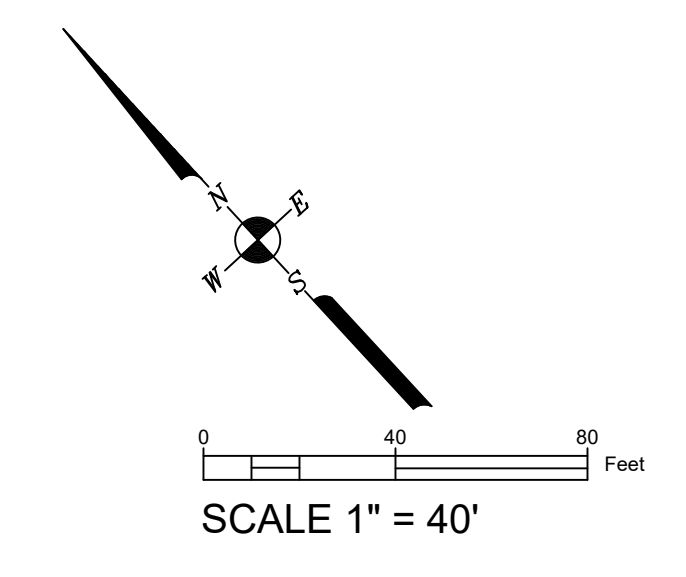
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ELEVATION = 94.48', NAVD 1988, 2001 ADJUSTMENT



**PROPOSED LEGEND:**

- PROP TYPE A INLET
- PROP MANHOLE
- PROP. STORM SEWER

**STORM KEY NOTES**

- 1 PROPOSED 15" HDPE @ 0.40 (ROOF DRAIN HEADER)
- 2 PROPOSED 12" HDPE @ 0.50 (ROOF DRAIN HEADER)
- 3 PROPOSED 10" HDPE @ 0.40 (ROOF DRAIN HEADER)
- 4 PROPOSED 8" HDPE @ 0.70 (ROOF DRAIN HEADER)
- 5 PROPOSED 8" HDPE @ 0.70 (SEE MEP & ARCH. PLANS FOR CONTINUATION)
- 6 PROPOSED CLEANOUT
- 7 PROPOSED 15" X 12" REDUCER
- 8 PROPOSED 12" X 10" REDUCER
- 9 PROPOSED 10" HDPE @ 0.50 (SEE MEP & ARCH. PLANS FOR CONTINUATION)

**DETENTION NOTE:**

PER COORDINATION WITH FORTBEND COUNTY DRAINAGE DISTRICT IT WAS DETERMINED DETENTION WILL NOT BE REQUIRED WITH THIS DEVELOPMENT. DETENTION WILL BE REQUIRED IN FUTURE AS THE REMAINDER OF TRACT GETS FULLY DEVELOPED.

S.A. STONE SURVEY NO. 10  
ABSTRACT 392

COUNTY OF FORT BEND  
REMAINDER OF A  
CALLED 159.309 ACRES  
COUNTY OF FORT BEND  
F.B.C.C.F. NO. 9877354

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Project No.: 2330

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Issue Log		
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Revisions		
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**DRAINAGE  
AREA MAP**

**C2.02**

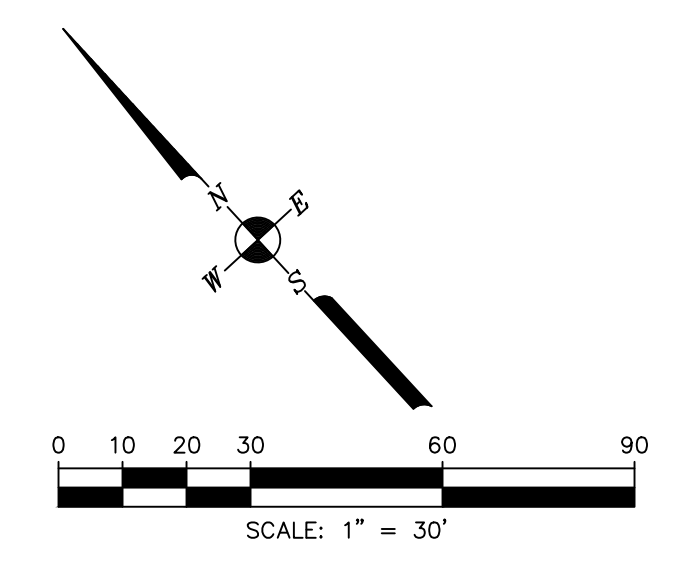
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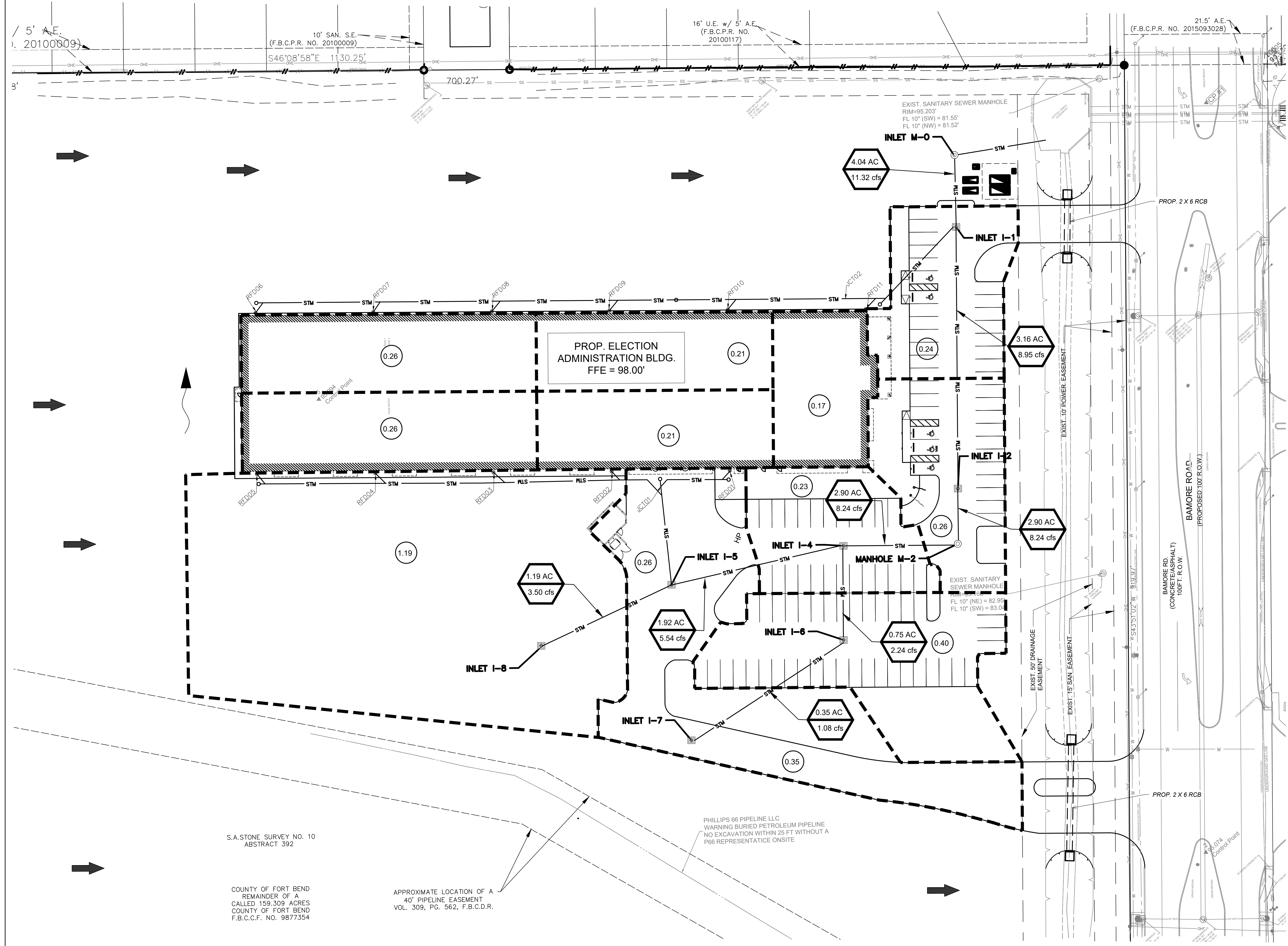
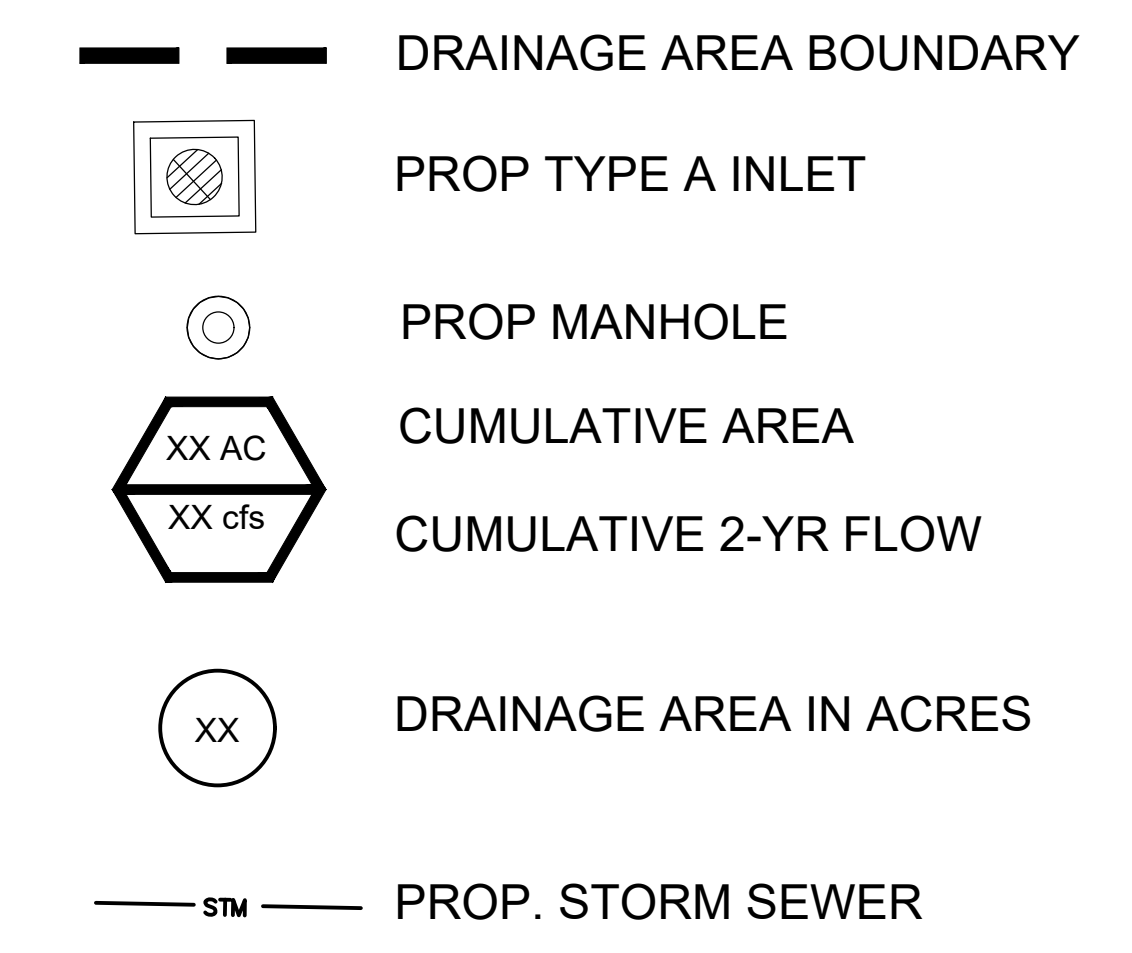
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**PROPOSED LEGEND:**



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**STORM SEWER CALCULATION FORM**

PROJECT: FBC ELECTIONS BUILDING **2YR**  
PROJ. NO. 23DL75 "b" **45.19**  
PREPARED BY: NM DATE: 1/16/2024 "d" **8.51**  
CHECKED BY: JM DATE: 1/16/2024 "e" **0.7122**  
FILENAME: STORM CALCS

LINE	MANHOLE		AREA		"C" (AVG INCR)	"CA" (AVG TOTAL)	"TC" min.	"T" cfs	Q cfs	REACH FT	LINE			DESIGN			FALL FT	OTHER LOSS FT	FLOWLINE		ACT V fps	HYD GRAD %	H	ELEV HYD GRAD		TOP OF PIPE DNSTM	G. ELEV.	
	FROM	TO	INCR ac.	TOTAL ac.							SIZE, IN.	SLOPE %	"N"	Q cfs	V fps	UPSTM			DNSTM	UPSTM				DNSTM	UPSTM		DNSTM	
L7	I-7	I-6	0.35	0.35	0.8	0.28	23.31	3.84	1.08	125	12	0.40%	0.012	2.45	3.12	0.50	0	91.60	91.10	1.37	0.077	0.097	93.46	93.36	92.10	96.30	96.25	
L6	I-6	I-4	0.40	0.75	0.8	0.60	24.51	3.74	2.24	62	15	0.30%	0.012	3.84	3.13	0.19	0	91.10	90.91	1.83	0.102	0.063	93.36	93.30	92.16	96.25	96.00	
L8	I-8	I-5	1.19	1.19	0.8	0.95	25.31	3.68	3.50	101	24	0.15%	0.012	9.51	3.03	0.15	0	91.25	91.10	1.12	0.020	0.021	93.38	93.36	93.10	94.70	96.40	
L5	I-5	I-4	0.26	1.92	0.8	1.54	26.22	3.61	5.54	122	24	0.15%	0.012	9.51	3.03	0.18	0	91.10	90.91	1.77	0.051	0.062	93.36	93.30	92.91	96.40	96.00	
L4	I-4	M-3	0.23	2.90	0.8	2.32	27.06	3.55	8.24	78	24	0.15%	0.012	9.51	3.03	0.12	0	90.91	90.80	2.62	0.113	0.088	93.30	93.21	92.80	96.00	96.50	
L3	M-3	I-2	0.00	2.90	0.8	2.32	27.06	3.55	8.24	37	24	0.15%	0.012	9.51	3.03	0.06	0	90.80	90.74	2.62	0.113	0.042	93.21	93.17	92.74	96.50	96.05	
L2	I-2	I-1	0.26	3.16	0.8	2.53	27.25	3.54	8.95	182	24	0.15%	0.012	9.51	3.03	0.27	0	90.74	90.47	2.85	0.133	0.242	93.17	92.93	92.47	96.05	95.90	
L1	I-1	M-0	0.24	4.04	0.8	3.23	27.79	3.50	11.32	48	30	0.15%	0.012	17.25	3.52	0.07	0	90.47	90.40	2.31	0.065	0.031	92.93	92.90	92.90	95.90	95.50	
L0	M-0	Outlet	0.00	4.04	0.8	3.23	27.79	3.50	11.32	64	30	0.15%	0.012	17.25	3.52	0.10	0	90.40	90.30	2.31	0.065	0.041	92.84	92.80	92.80	95.50	93.30	

**STORM SEWER CALCULATION FORM**

PROJECT: FBC ELECTIONS BUILDING **100 Yr**  
PROJ. NO. 23DL75 "b" **42.99**  
PREPARED BY: NM DATE: 1/16/2024 "d" **1.08**  
CHECKED BY: JM DATE: 1/16/2024 "e" **0.5274**  
FILENAME: STORM CALCS

LINE	MANHOLE		AREA		"C" (AVG INCR)	"CA" (AVG TOTAL)	"TC" min.	"T" cfs	Q cfs	REACH FT	LINE			DESIGN			FALL FT	OTHER LOSS FT	FLOWLINE		ACT V fps	HYD GRAD %	H	ELEV HYD GRAD		TOP OF PIPE DNSTM	G. ELEV.	
	FROM	TO	INCR ac.	TOTAL ac.							SIZE, IN.	SLOPE %	"N"	Q cfs	V fps	UPSTM			DNSTM	UPSTM				DNSTM	UPSTM		DNSTM	
L7	I-7	I-6	0.35	0.35	0.8	0.28	23.31	7.98	2.23	125	12	0.40%	0.012	2.45	3.12	0.50	0	91.60	91.10	2.85	0.334	0.417	97.12	96.70	92.10	96.30	96.25	
L6	I-6	I-4	0.40	0.75	0.8	0.60	24.51	7.78	4.67	62	15	0.30%	0.012	3.84	3.13	0.19	0	91.10	90.91	3.81	0.443	0.275	96.70	96.43	92.16	96.25	96.00	
L8	I-8	I-5	1.19	1.19	0.8	0.95	25.31	7.65	7.28	101	24	0.15%	0.012	9.51	3.03	0.15	0	91.25	91.10	2.32	0.088	0.089	96.13	96.04	93.10	94.70	96.40	
L5	I-5	I-4	0.26	1.92	0.8	1.54	26.22	7.52	11.55	122	24	0.15%	0.012	9.51	3.03	0.18	0	91.10	90.91	3.68	0.221	0.270	96.70	96.43	92.91	96.40	96.00	
L4	I-4	M-3	0.23	2.90	0.8	2.32	27.06	7.40	17.18	78	24	0.15%	0.012	9.51	3.03	0.12	0	90.91	90.80	5.47	0.489	0.381	96.43	96.04	92.80	96.00	96.50	
L3	M-3	I-2	0.00	2.90	0.8	2.32	27.06	7.40	17.18	37	24	0.15%	0.012	9.51	3.03	0.06	0	90.80	90.74	5.47	0.489	0.181	96.04	95.86	92.74	96.50	96.05	
L2	I-2	I-1	0.26	3.16	0.8	2.53	27.25	7.37	18.64	182	24	0.15%	0.012	9.51	3.03	0.27	0	90.74	90.47	5.94	0.576	1.048	95.86	94.81	92.47	96.05	95.90	
L1	I-1	M-0	0.24	4.04	0.8	3.23	27.79	7.30	23.60	48	30	0.15%	0.012	17.25	3.52	0.07	0	90.47	90.40	4.81	0.281	0.135	94.81	94.68	92.90	95.90	95.50	
L0	M-0	Outlet	0.00	4.04	0.8	3.23	27.79	7.30	23.60	64	30	0.15%	0.012	17.25	3.52	0.10	0	90.40	90.30	4.81	0.281	0.180	94.68	94.50	92.80	95.50	93.30	

Project No.: 2330

Drawing Date: 01.17.2024  
Drawn: RR  
Checked: DM  
Scale: AS NOTED

Issue Log:

No.	Descriptor	Date

Revisions:

No.	Description	Date

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**DRAINAGE  
CALCULATIONS**

**C2.03**



01/17/2024  
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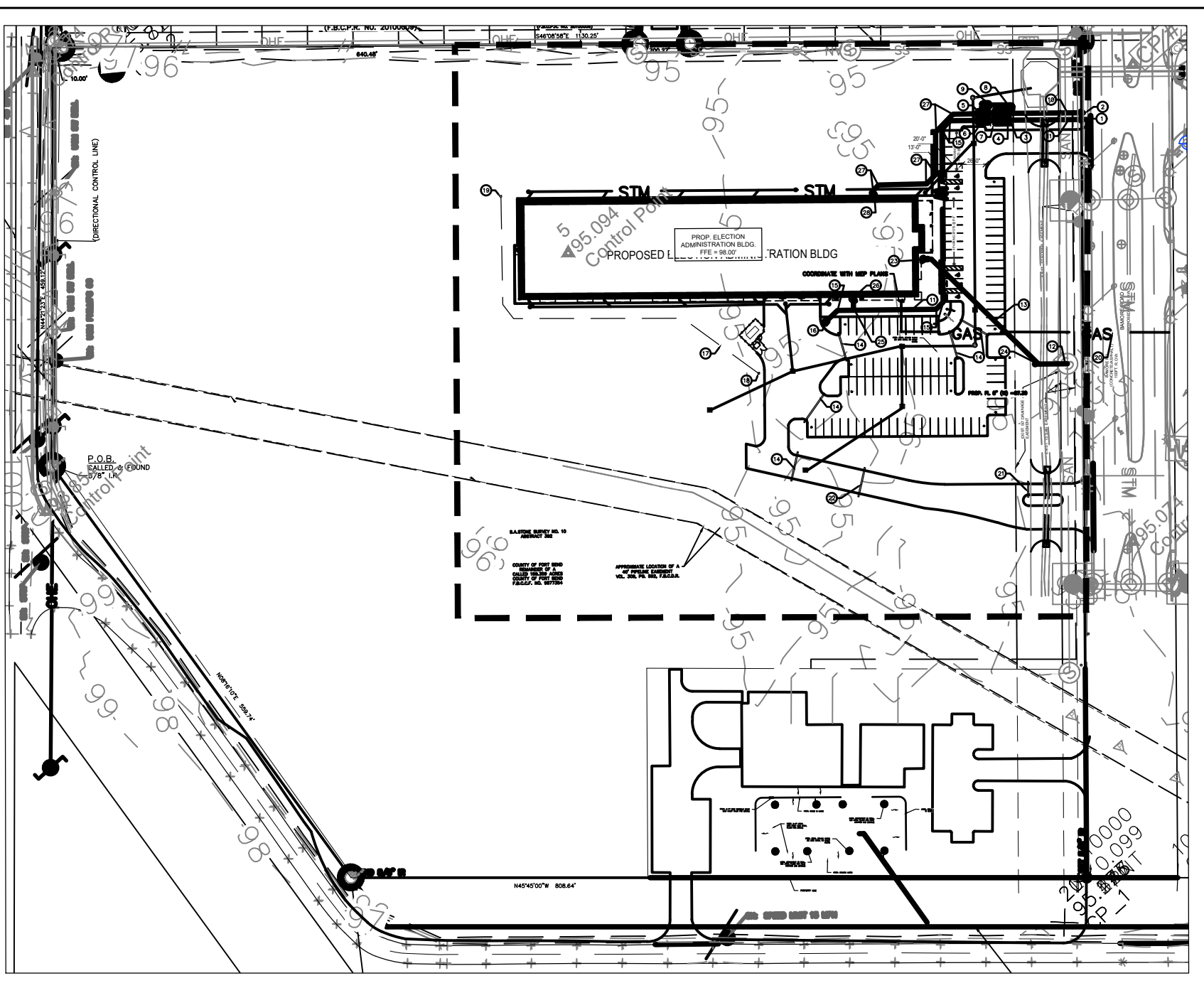
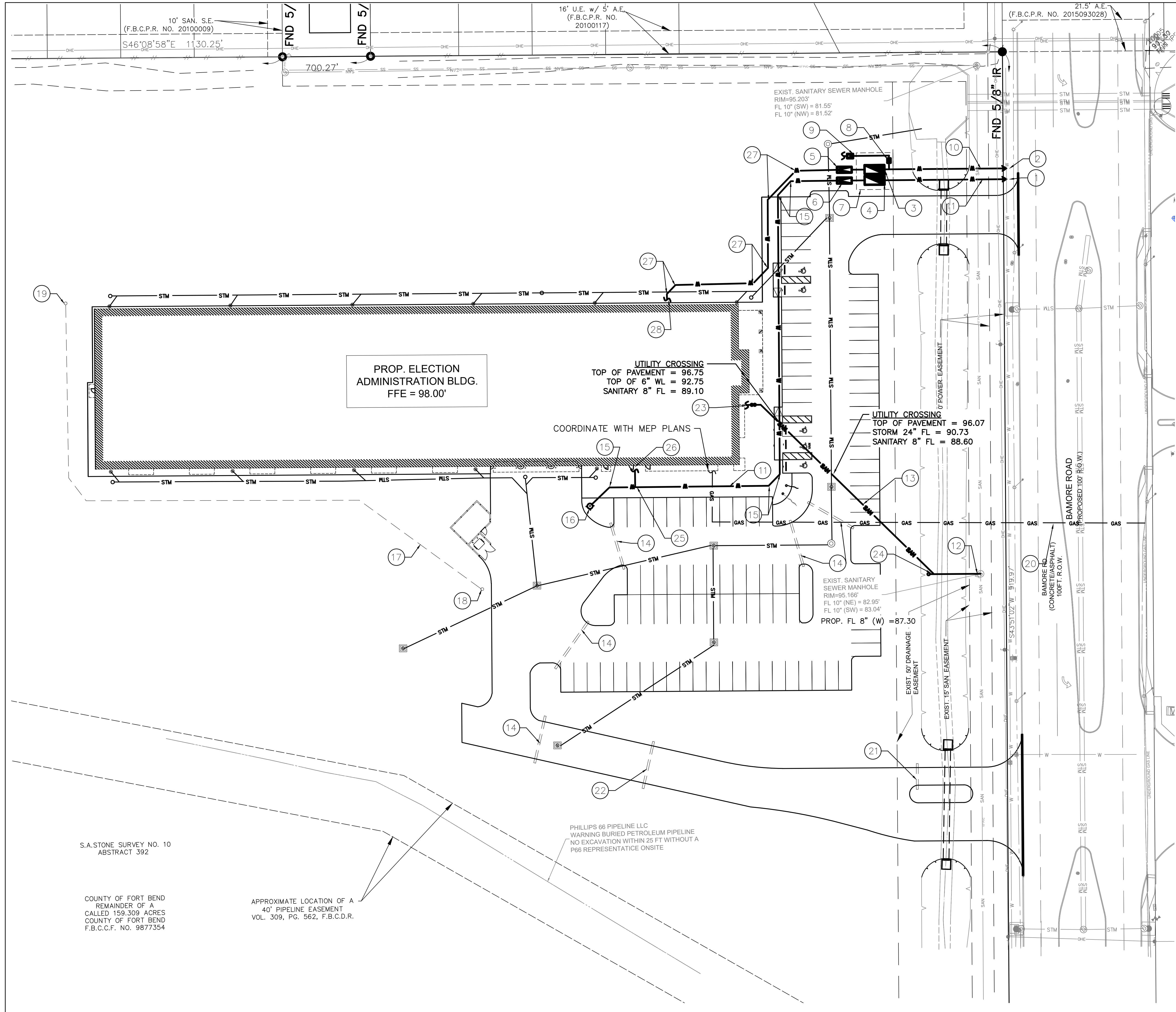
ISAN  
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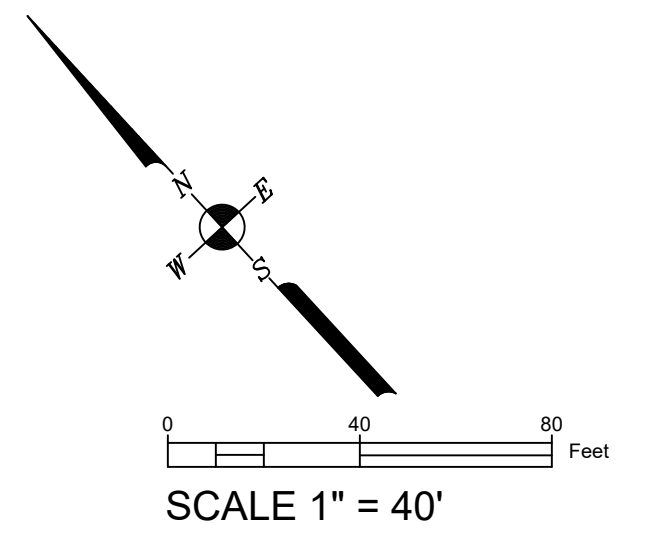
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**FBC Elections Administration Building**

3700 BAMORE ROAD,  
ROSENBERG, TX. 77471  
FOR BID AND PERMIT



OVERALL SITE MAP  
SCALE: 1" = 150'



SCALE 1" = 40'

**FLOODPLAIN INFORMATION**

THIS TRACT LIES IN ZONE "X", AS PER THE NATIONAL FLOOD INSURANCE PROGRAM FIRM FOR FORT BEND COUNTY, TEXAS, COMMUNITY NO. 480228, PANEL NUMBER 0240L, MAP NUMBER 48157C0240L. LATEST AVAILABLE PUBLISHED REVISION DATED APRIL 2, 2014.

**BENCHMARK INFORMATION**

A BRASS DISK (NGS MONUMENT M1219) LOCATED ON THE TOP AND 0.6' SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL OF A 5-CHANNEL CULVERT, APPROXIMATELY 25' EAST OF THE CENTERLINE OF STATE HIGHWAY 36, APPROXIMATELY 0.45 MILE NORTH OF THE JUNCTION OF BAND ROAD.

ELEVATION = 94.48', NAVD 1988, 2001 ADJUSTMENT

**UTILITY KEY NOTES**

1. PROPOSED 1~12"x2" SADDLE CONNECTION W/ CORPORATION STOP
2. PROPOSED 1~12"x6" SADDLE CONNECTION W/ CORPORATION STOP
3. PROPOSED 2" WATER METER
4. PROPOSED 6" COMPOUND FIRE WATER METER
5. PROPOSED 2" BACKFLOW PREVENTER
6. PROPOSED 6" BACKFLOW PREVENTER
7. PROPOSED 20"x20" WATER METER EASEMENT
8. PROPOSED 1 1/2" IRRIGATION WATER METER
9. PROPOSED 1 1/2" RPZ BACKFLOW PREVENTER
10. PROP. 2" DOMESTIC WATER LINE (SCH 40 PVC)
11. PROP. 6" (C900) PVC WATERLINE
12. CONNECT PROP. 8" PIPE TO EXISTING SANITARY MANHOLE
13. PROP. 8" SANITARY SEWER LINE, PVC (SDR 35) @ 1%
14. PROP. 3" IRRIGATION SLEEVE
15. PROP. 6" ~ 45-DEGREE BEND
16. PROP. FIRE HYDRANT WITH BLOW-OFF VALVE
17. PROP. 4" C-900 PVC DRY STAND PIPE
18. PROP. REMOTE FIRE HOSE INLET CONNECTION
19. PROP. REMOTE FIRE HOSE OUTLET CONNECTION
20. PROP. 2" GAS LINE TO BE COORDINATED WITH CENTERPOINT ENERGY (REF: MEP PLANS FOR CONTINUATION)
21. PROP. 2 - 2" PVC SLEEVES FOR FUTURE ELECTRICAL LINES TO SERVE FUTURE MONUMENT SIGN
22. PROP. 2 - 3" PVC SLEEVES FOR FUTURE LIGHTING
23. PROP. SANITARY BUILDING ENTRY/EXIT LOCATION, PROP. DOUBLE CLEANOUT. (REF: MEP PLANS FOR CONTINUATION)
24. PROP. 8" ~ 45-DEGREE BEND AND CLEANOUT
25. PROP. 6" x 6" TEE
26. PROP. 6" WATER LINE FOR BUILDING FIRE PROTECTION (REF: FIRE PROTECTION PLANS)
27. PROP. 2" ~ 45-DEGREE BEND
28. PROP. 2" DOMESTIC WATER BUILDING ENTRY/EXIT LOCATION (REF: MEP PLANS FOR CONTINUATION)

S.A. STONE SURVEY NO. 10  
ABSTRACT 392

COUNTY OF FORT BEND  
REMAINDER OF A  
CALLED 159.309 ACRES  
COUNTY OF FORT BEND  
F.B.C.C.F. NO. 9877354

APPROXIMATE LOCATION OF A  
40' PIPELINE EASEMENT  
VOL. 309, PG. 562, F.B.C.D.R.

PHILLIPS 66 PIPELINE LLC  
WARNING BURIED PETROLEUM PIPELINE  
NO EXCAVATION WITHIN 25 FT WITHOUT A  
P66 REPRESENTATIVE ONSITE

This document is for interim review only

1" = 30'-0"

**CIVIL UTILITY  
PLAN**

**C3.00**



01/17/2024

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**FBC Elections Administration Building**

3700 BAMORE ROAD,  
ROSENBERG, TX. 77471  
FOR BID AND PERMIT

Project No.: 2330

Drawing Date: 01.17.2024  
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Scale: AS NOTED

Issue Log:

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Revisions:

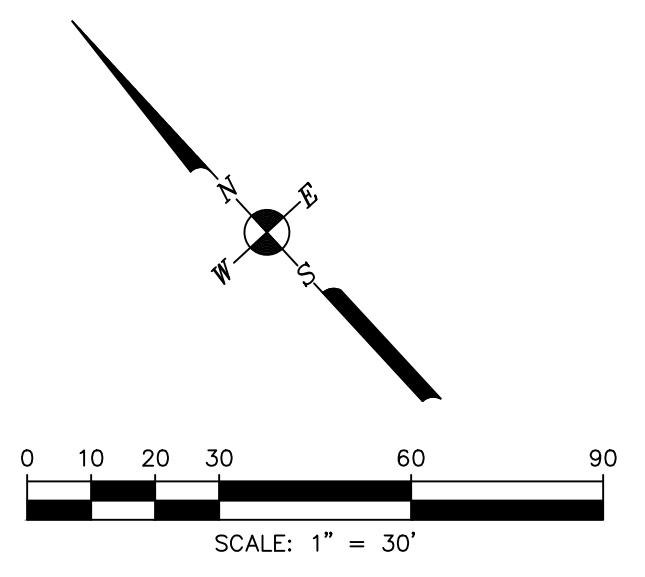
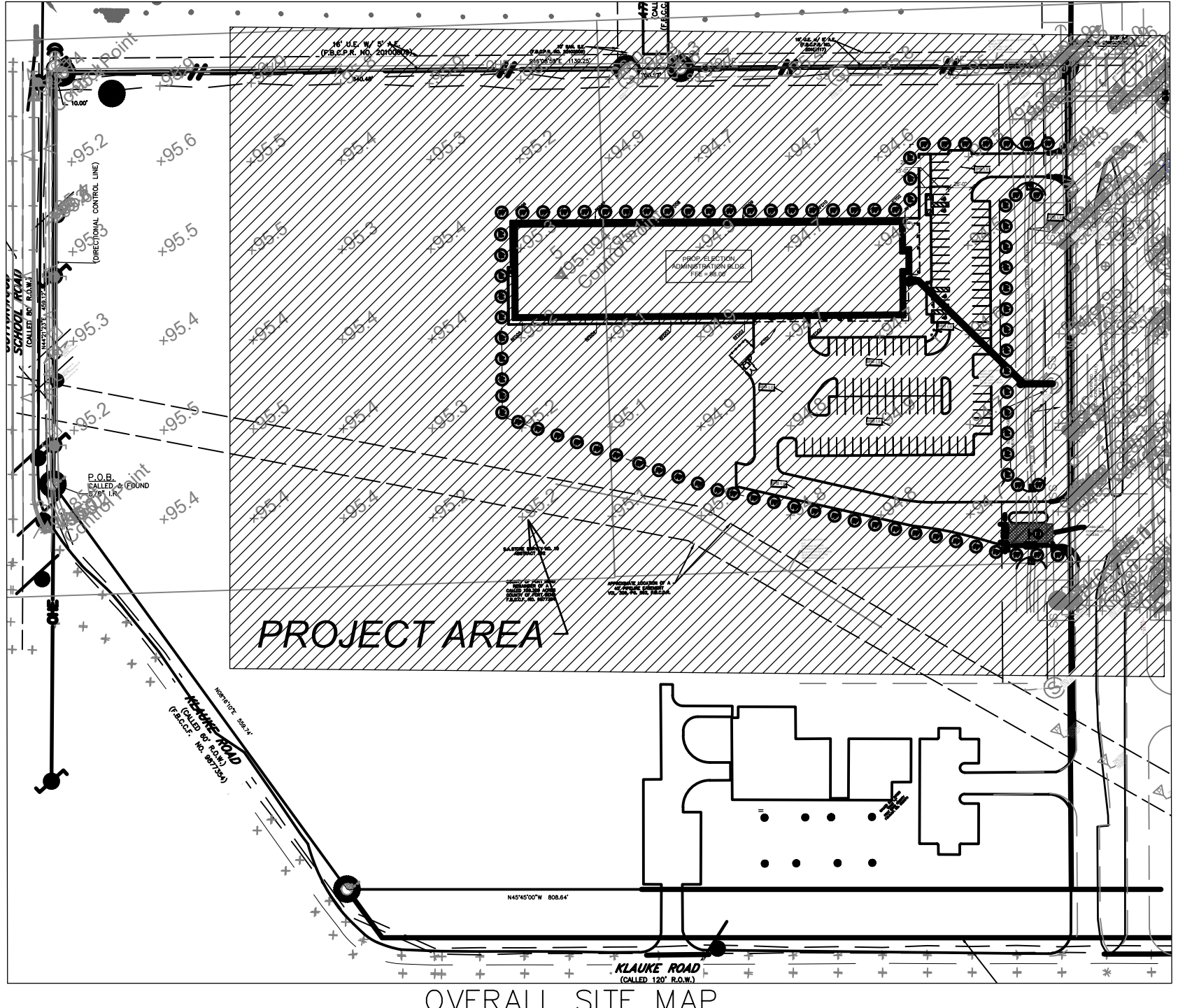
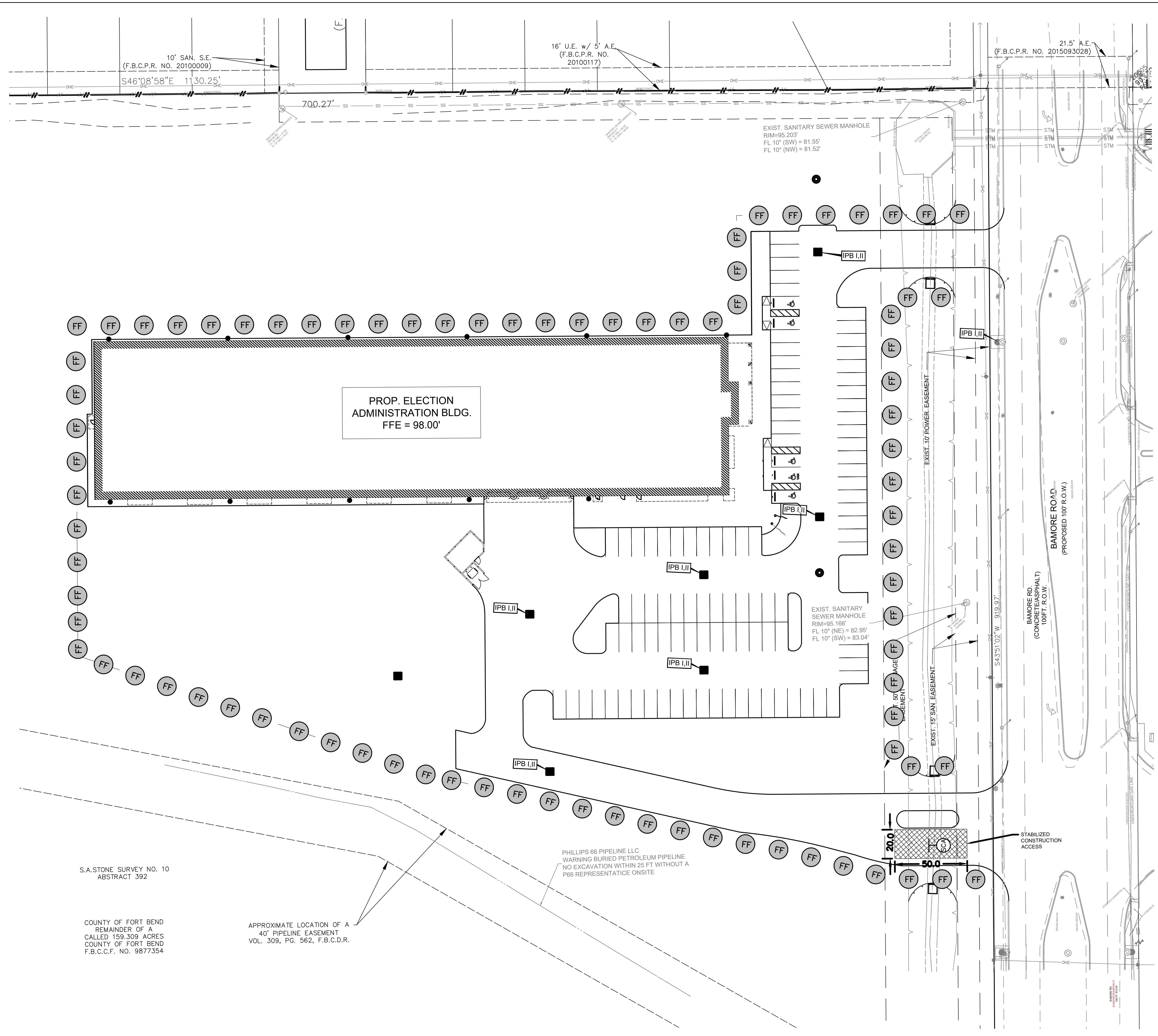
No.	Description	Date

1" = 40'-0"

SWPPP PLAN

**C4.00**

This document is for interim review only



**FLOODPLAIN INFORMATION**

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ELEVATION = 94.48', NAVD 1988, 2001 ADJUSTMENT

**LEGEND PROPOSED:**

- REINFORCED FILTER FABRIC BARRIER
- INLET PROTECTION BARRIER STAGE 1 & 2
- STABILIZED CONSTRUCTION ACCESS

S.A. STONE SURVEY NO. 10  
ABSTRACT 392

COUNTY OF FORT BEND  
REMAINDER OF A  
CALLED 159.309 ACRES  
COUNTY OF FORT BEND  
F.B.C.C.F. NO. 9877354

APPROXIMATE LOCATION OF A  
40' PIPELINE EASEMENT  
VOL. 309, PG. 562, F.B.C.D.R.

PHILLIPS 66 PIPELINE LLC  
WARNING BURIED PETROLEUM PIPELINE  
NO EXCAVATION WITHIN 25 FT WITHOUT A  
P66 REPRESENTATIVE ON SITE

EXIST. SANITARY SEWER MANHOLE  
RIM=95.203'  
FL 10" (SW) = 81.55'  
FL 10" (NW) = 81.52'

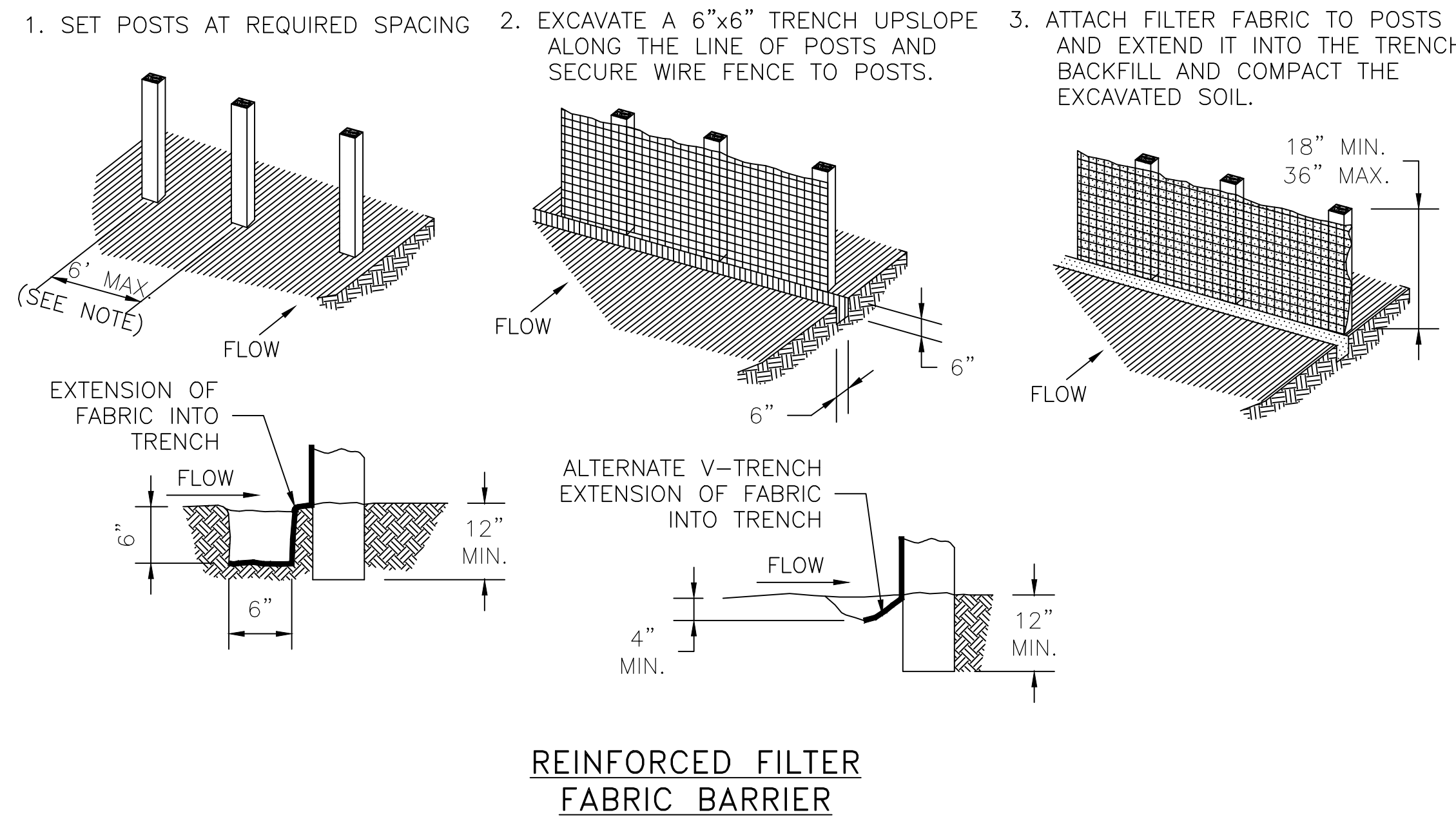
EXIST. SANITARY SEWER MANHOLE  
RIM=95.166'  
FL 10" (NE) = 82.95'  
FL 10" (SW) = 83.04'

BAMORE ROAD  
(PROPOSED 100' R.O.W.)

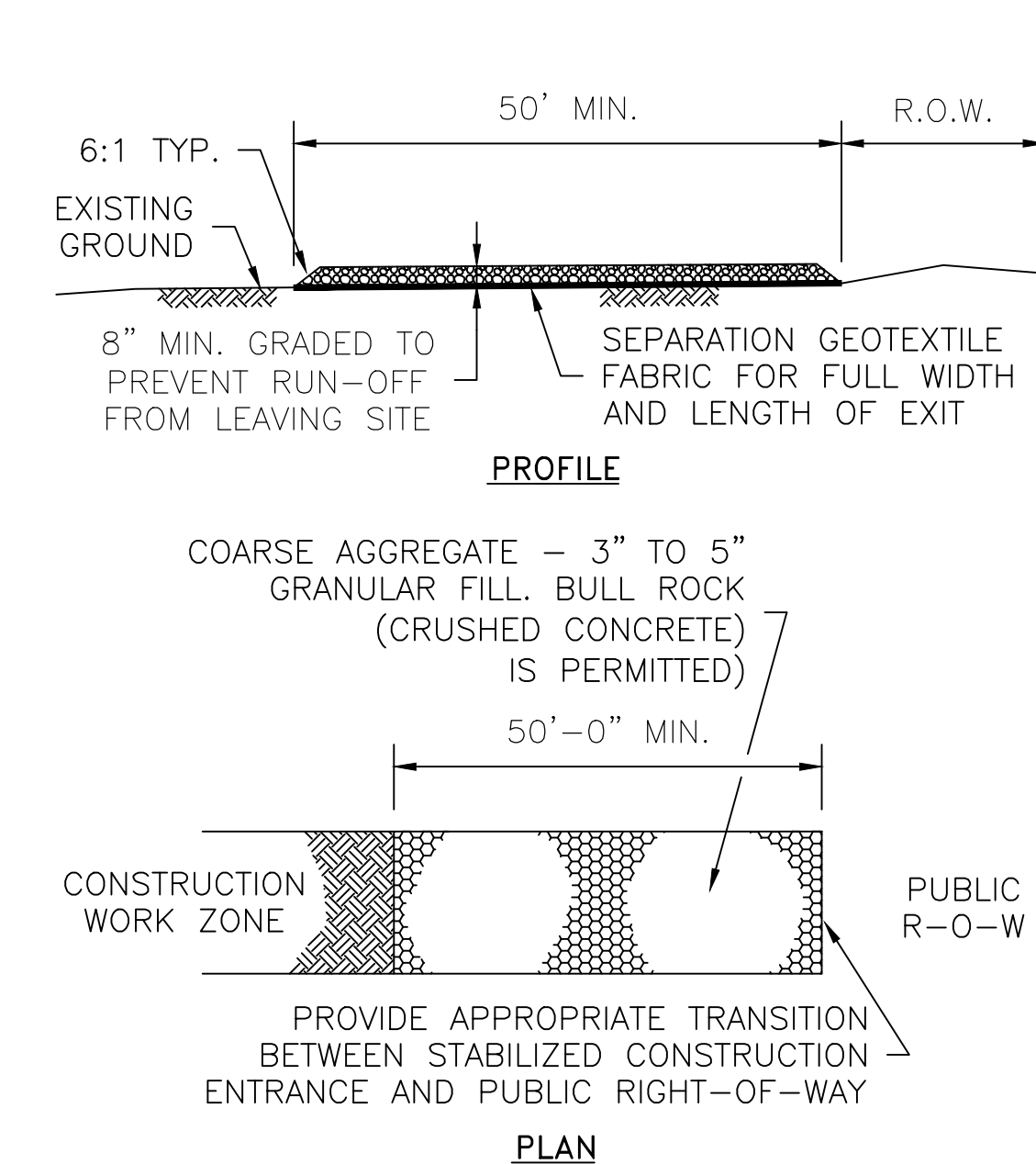
BAMORE RD.  
(CONCRETE HEADWALL)  
INLET FLOW

20.0  
50.0

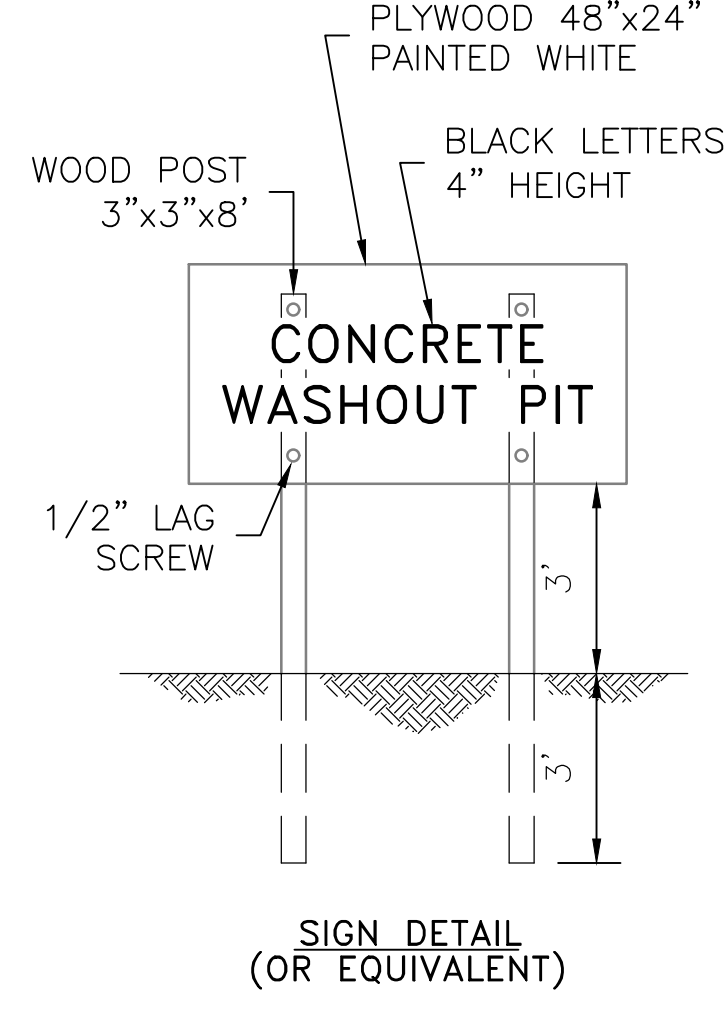
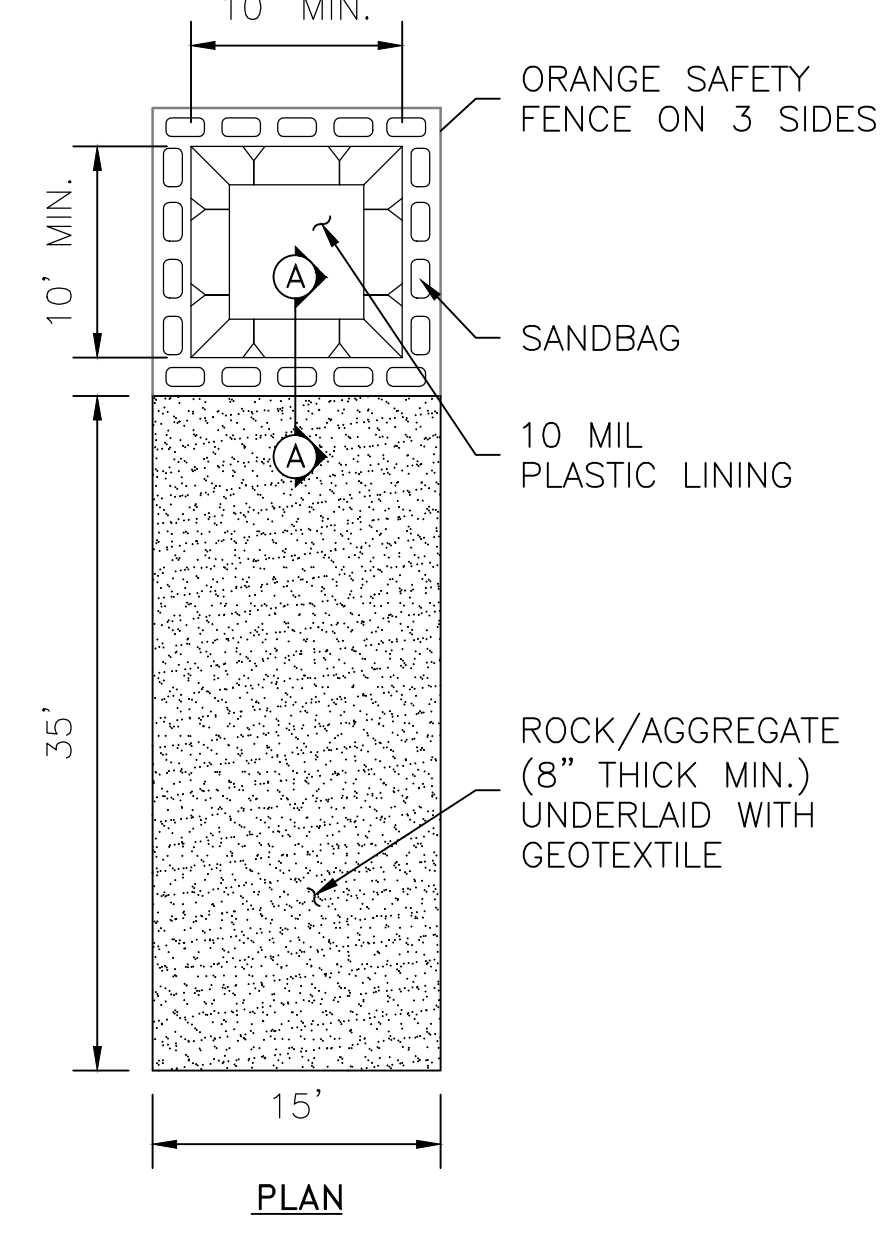
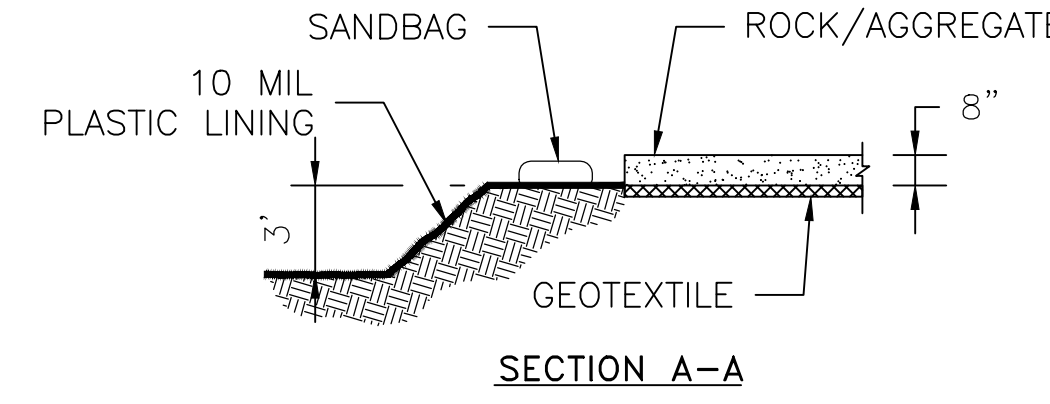
STABILIZED CONSTRUCTION ACCESS



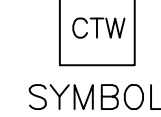
- GENERAL NOTES:**
1. SECURELY FASTEN MESH FENCING TO POSTS WITH STAPLES OR TIE WIRES.
  2. SECURELY FASTEN FILTER FABRIC TO MESH FENCING.
  3. WHEN TWO SECTIONS OF FILTER FABRIC ADJOIN EACH OTHER, OVERLAP 6 INCHES AT A POST, FOLD TOGETHER, AND ATTACH TO A POST.
  4. REMOVE SEDIMENT DEPOSITS WHEN SILT REACHES ONE-THIRD OF THE HEIGHT OF THE FENCE IN DEPTH.



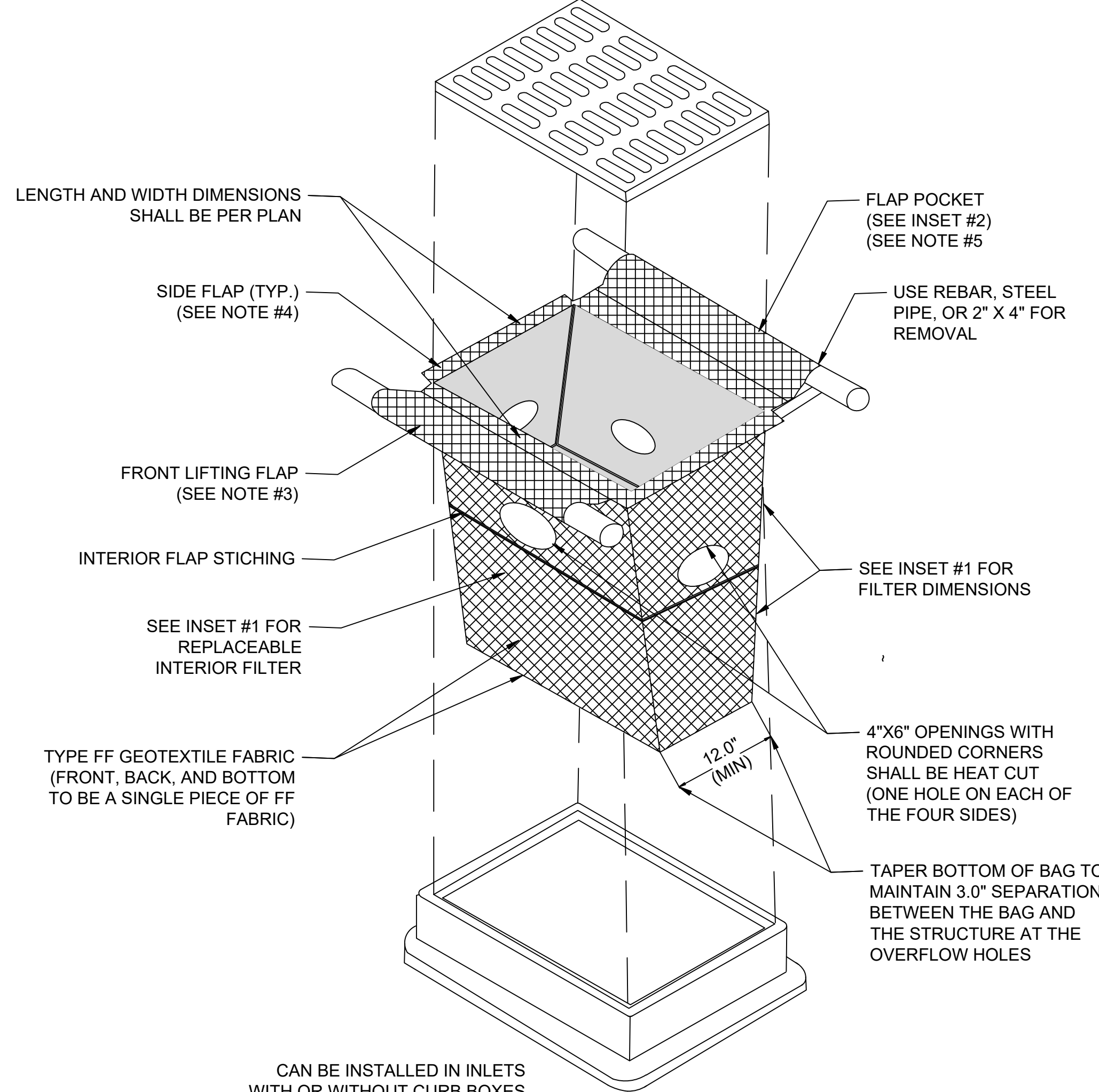
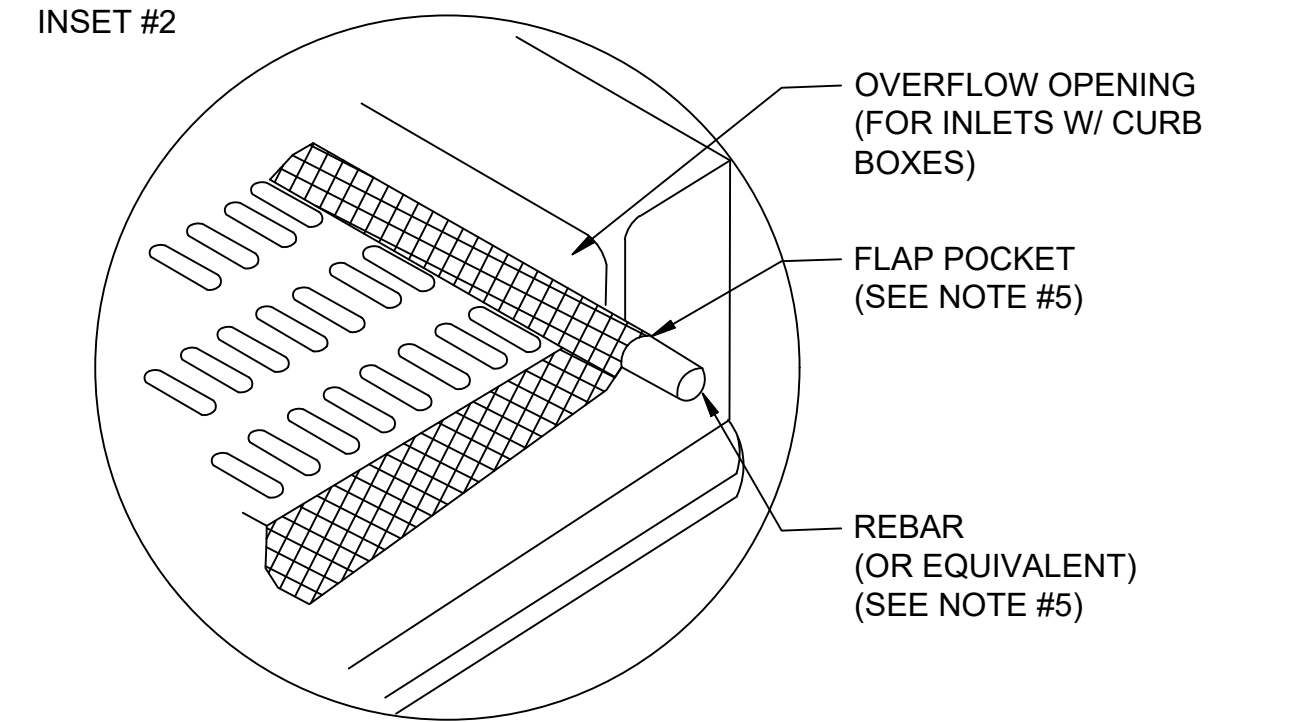
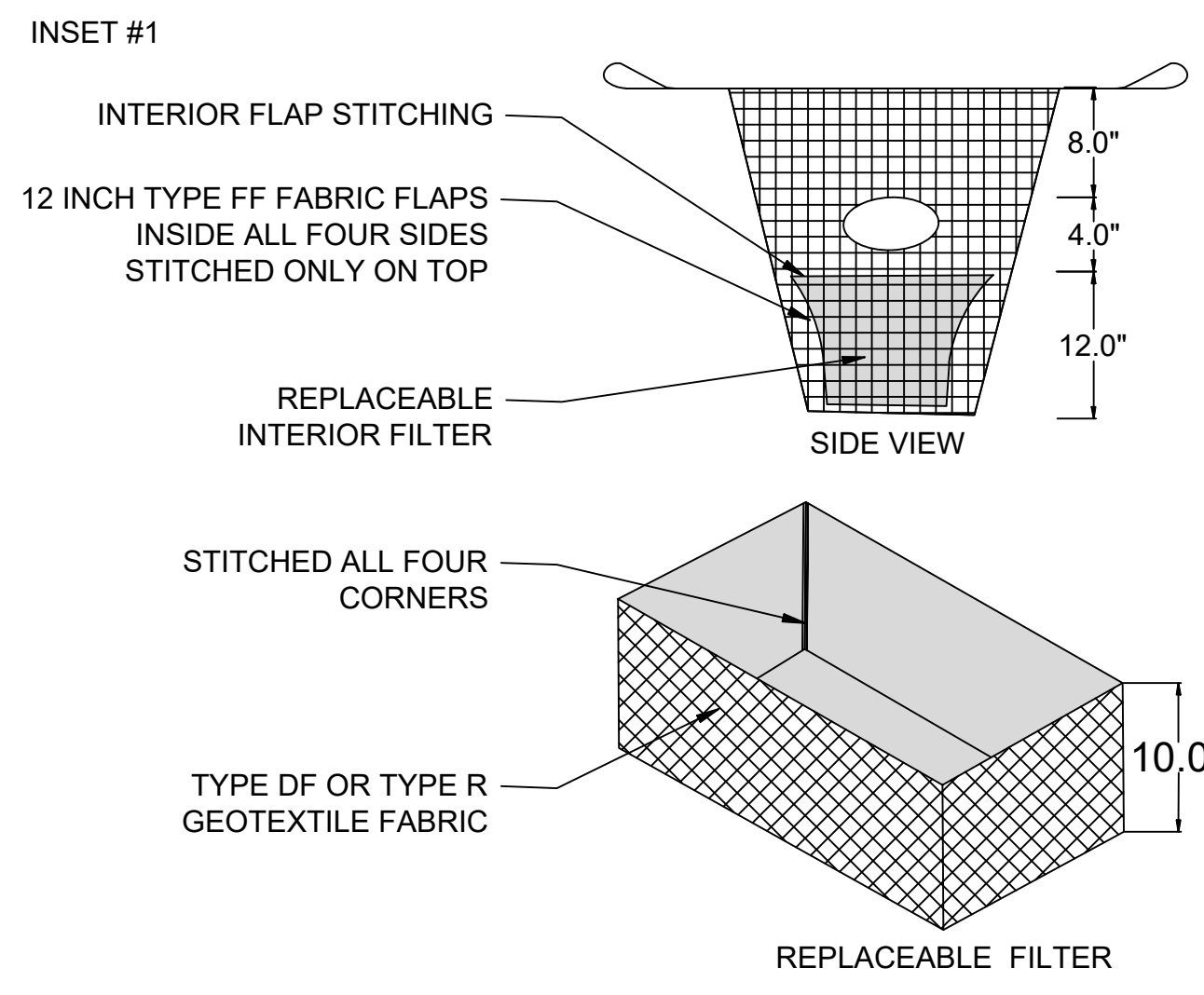
- GENERAL NOTES:**
1. MINIMUM LENGTH IS AS SHOWN ON CONSTRUCTION DRAWINGS OR 50 FEET, WHICHEVER IS MORE.
  2. CONSTRUCT AND MAINTAIN CONSTRUCTION EXIT WITH CONSTANT WIDTH ACROSS ITS LENGTH, INCLUDING ALL POINTS OF INGRESS OR EGRESS.
  3. UNLESS SHOWN ON THE CONSTRUCTION DRAWINGS, STABILIZATION FOR OTHER AREAS WILL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS AS THE STABILIZED CONSTRUCTION EXIT.
  4. WHEN SHOWN ON THE CONSTRUCTION DRAWINGS, WIDEN OR LENGTHEN STABILIZED AREA TO ACCOMMODATE A TRUCK WASHING AREA. PROVIDE OUTLET SEDIMENT TRAP FOR THE TRUCK WASHING AREA.
  5. PROVIDE PERIODIC TOP DRESSING WITH ADDITIONAL COARSE AGGREGATE TO MAINTAIN THE REQUIRED DEPTH OR WHEN SURFACE BECOMES PACKED WITH MUD.
  6. PERIODICALLY TURN AGGREGATE TO EXPOSE A CLEAN DRIVING SURFACE.
  7. MINIMUM 14' WIDTH FOR ONE WAY TRAFFIC AND 20' WIDTH FOR TWO WAY TRAFFIC.



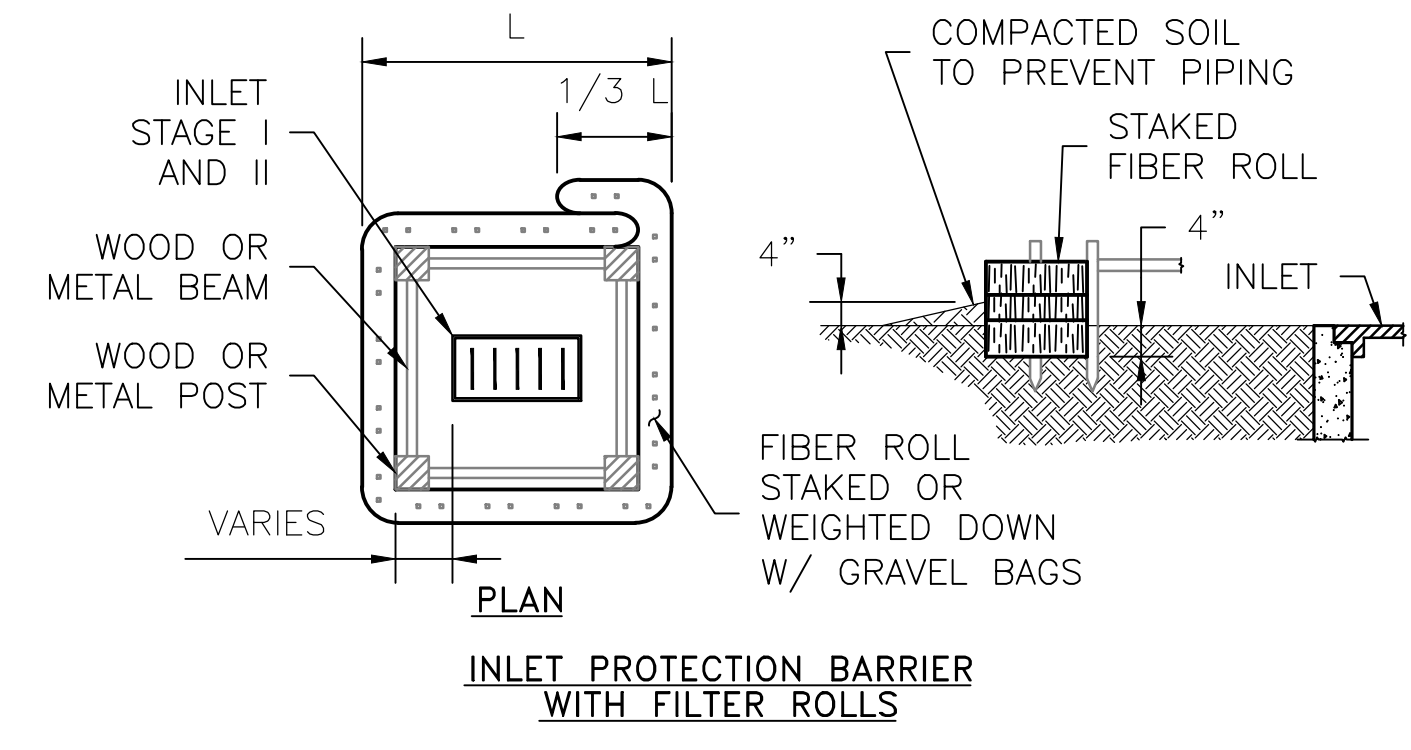
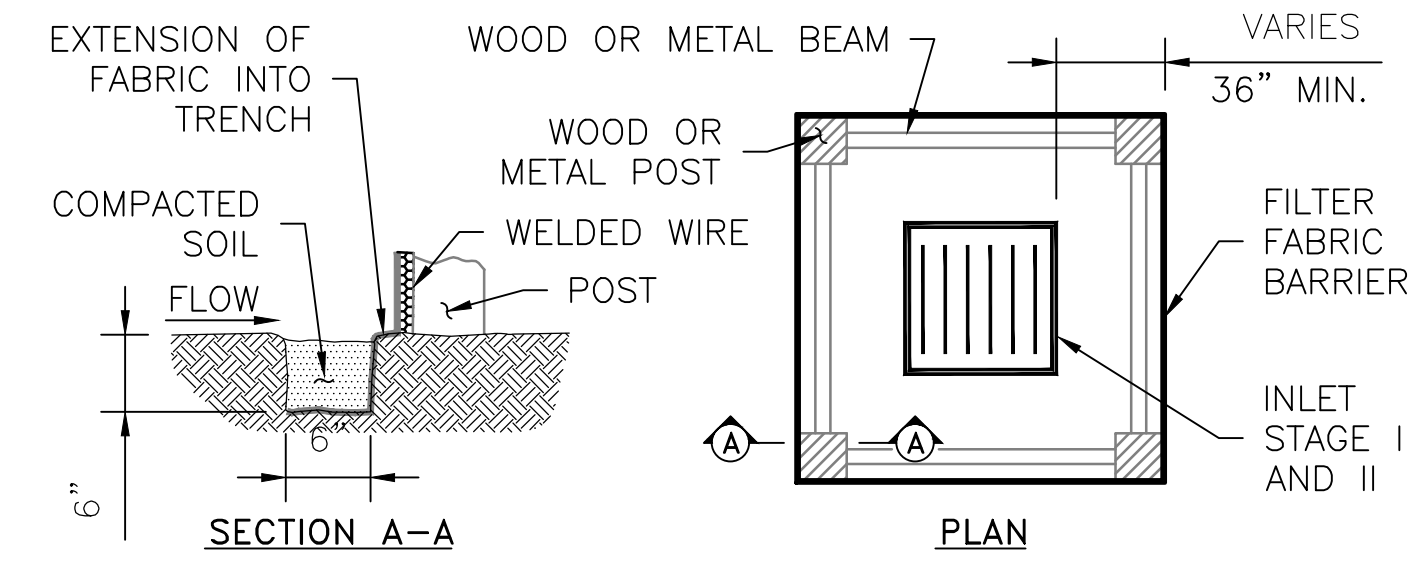
**CONCRETE TRUCK WASHOUT AREA**



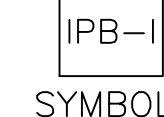
- GENERAL NOTES:**
1. POST A SIGN READING "CONCRETE WASHOUT PIT" NEXT TO THE PIT.
  2. VERBALLY INSTRUCT THE CONCRETE TRUCK DRIVERS WHERE THE PIT IS AND TO WASHOUT THEIR TRUCKS IN THE PIT AND NOWHERE ELSE.
  3. UPON THE CONCRETE SETTING UP (CURING, DRYING OUT), THE CONCRETE WASTE SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED OF PROPERLY BY THE CONTRACTOR. AFTER REMOVAL OF THE CONCRETE WASTE, THE WASHOUT PIT SHALL BE FILLED WITH CLEAN FILL MATERIAL AND COMPACTED TO IN-SITU CONDITIONS, OR AS DIRECTED BY THE PROJECT SPECIFICATIONS.
  4. CONCRETE WASHOUT PITS SHALL NOT BE LOCATED DIRECTLY ADJACENT TO, NOR AT ANY TIME DRAIN INTO THE STORM SEWER SYSTEM OR ANY OTHER SWALE, DITCH, OR WATERWAY.
  5. CONSTRUCT ENTRY ROAD AND BOTTOM OF WASHOUT AREA TO SUPPORT EXPECTED LOADINGS FROM TRUCKS EQUIPMENT.



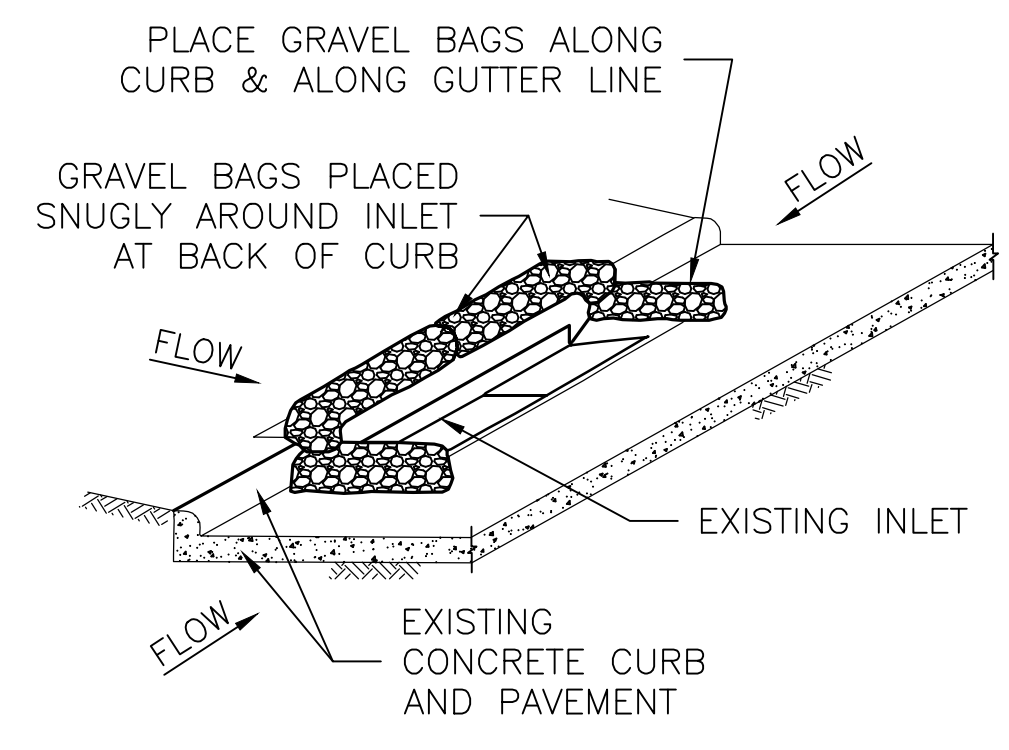
- MAINTENANCE NOTES:**
1. WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED IN THE FABRIC DOES NOT FALL INTO THE STRUCTURE. MATERIAL THAT HAS FALLEN INTO THE INLET SHALL BE IMMEDIATELY REMOVED.



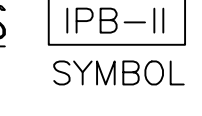
**INLET PROTECTION BARRIERS FOR STAGE I INLETS**



- GENERAL NOTES:**
1. FIBER ROLLS WILL BE UTILIZED ONLY WHEN SITE CONDITIONS DO NOT PERMIT THE USE OF FILTER FABRIC BARRIER, AND AS APPROVED BY THE ENGINEER.



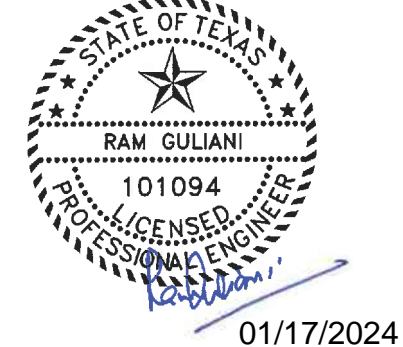
**INLET PROTECTION BARRIERS FOR STAGE II INLETS**



- GENERAL NOTES:**
1. REMOVE SEDIMENT DEPOSIT WHEN THE SEDIMENT HAS ACCUMULATED TO ONE-THIRD THE HEIGHT OF THE BARRIER.
  2. GRAVEL BAGS SHALL NOT BLOCK THROAT OF INLET UNLESS DIRECTED BY ENGINEER.

- NOTES**
1. TAPER BOTTOM OF BAG TO MAINTAIN THREE INCHES OF CLEARANCE BETWEEN THE BAG AND THE STRUCTURE. MEASURED FROM THE BOTTOM OF THE OVERFLOW OPENING TO THE STRUCTURE WALL.
  2. GEOTEXTILE FABRIC TYPE FF FOR FLAPS, TOP AND BOTTOM OF OUTSIDE OF FILTER BAG, FRONT, BACK AND BOTTOM OF FILTER BEING ONE PIECE.
  3. FRONT LIFTING FLAP IS TO BE USED WHEN REMOVING AND MAINTAINING FILTER BAG.
  4. SIDE FLAPS SHALL BE A MAXIMUM OF TWO INCHES LONG. FOLD THE FABRIC OVER AND REINFORCE WITH MULTIPLE STITCHES.
  5. FLAP PROCKETS SHALL BE LARGER ENOUGH TO ACCEPT WOOD 2"x4". THE REBAR, STEEL PIPE, OR WOOD SHALL BE INSTALLED IN THE REAR FLAP AND SHALL NOT BLOCK THE TOP HALF OF THE CURB FACE OPENING.

**INLET PROTECTION BASKET**



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**FBC Elections Administration Building**

3709 BLANKENBORG ROAD, ROSENBERG, TX, 77471 FOR BID AND PERMIT

Project No.: 2330

Drawing Date: 01.17.2024  
Drawn: RR  
Checked: DM  
Scale: AS NOTED

Issue Log:

No.	Descriptor	Date

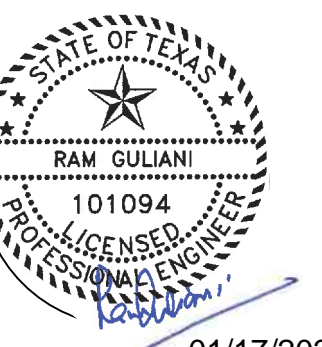
Revisions:

No.	Description	Date

SWPPP DETAILS

C4.01

This document is for internal review only



01/17/2024

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FBC Elections Administration Building

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FOR BID AND PERMIT

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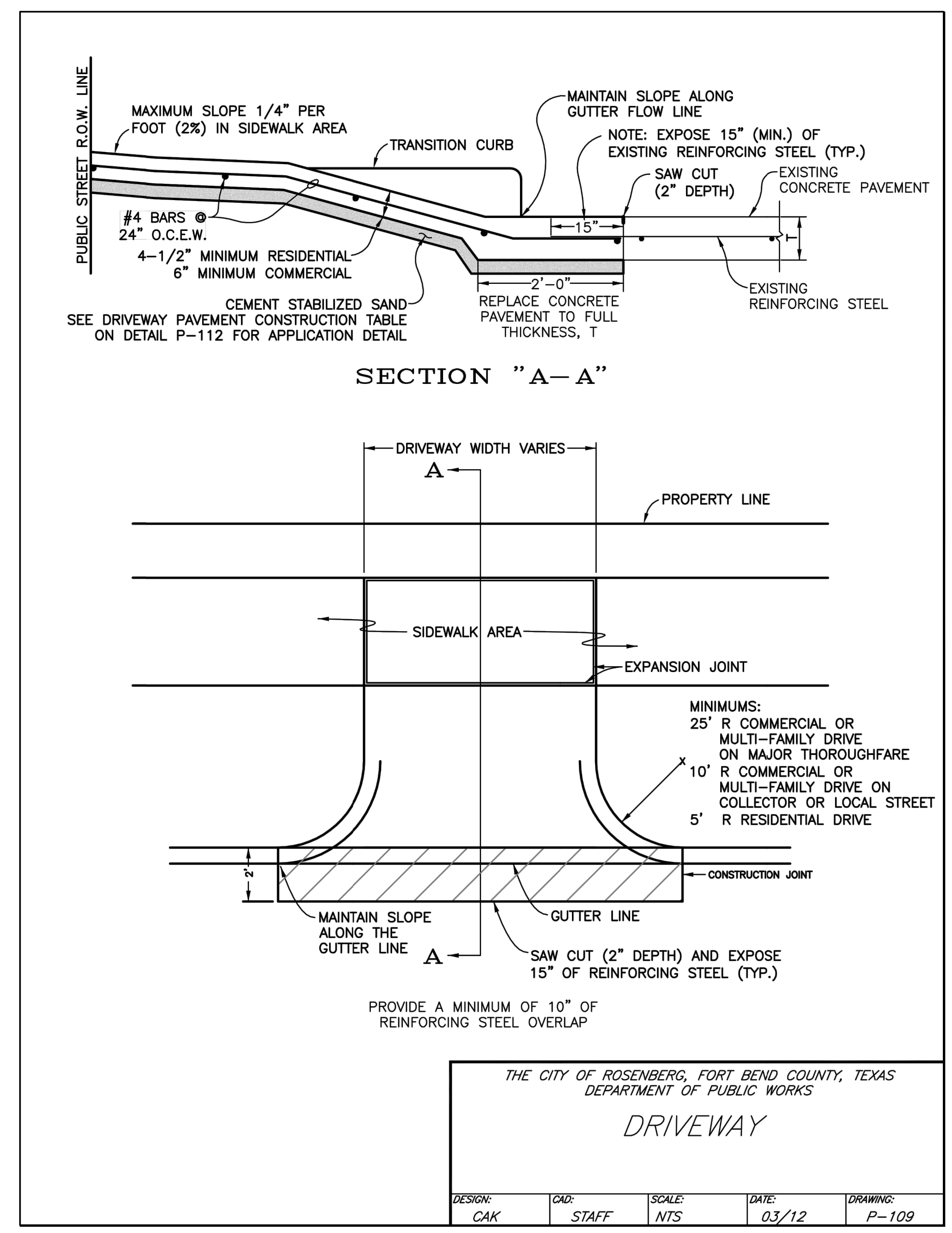
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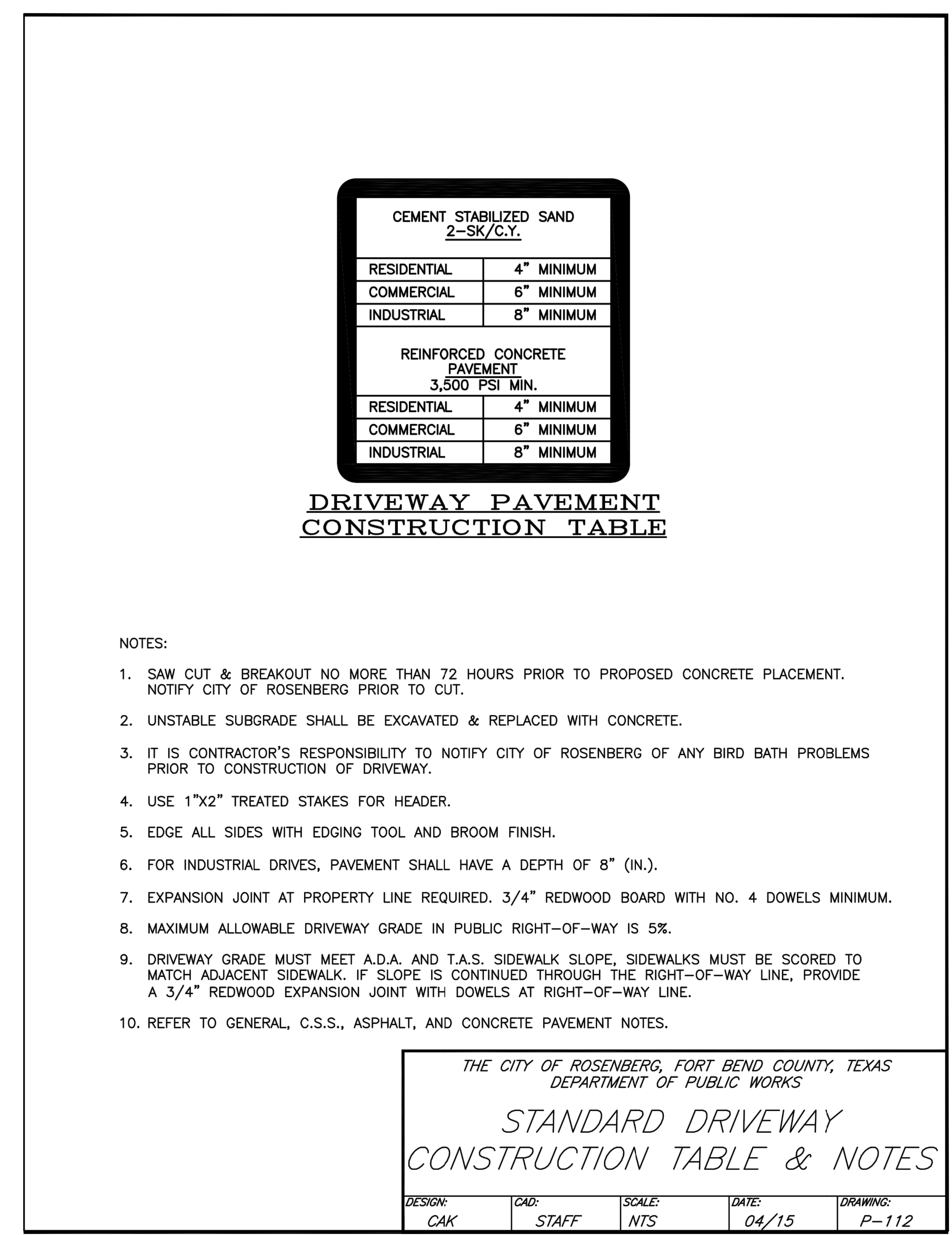
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CIVIL DETAILS

C5.00

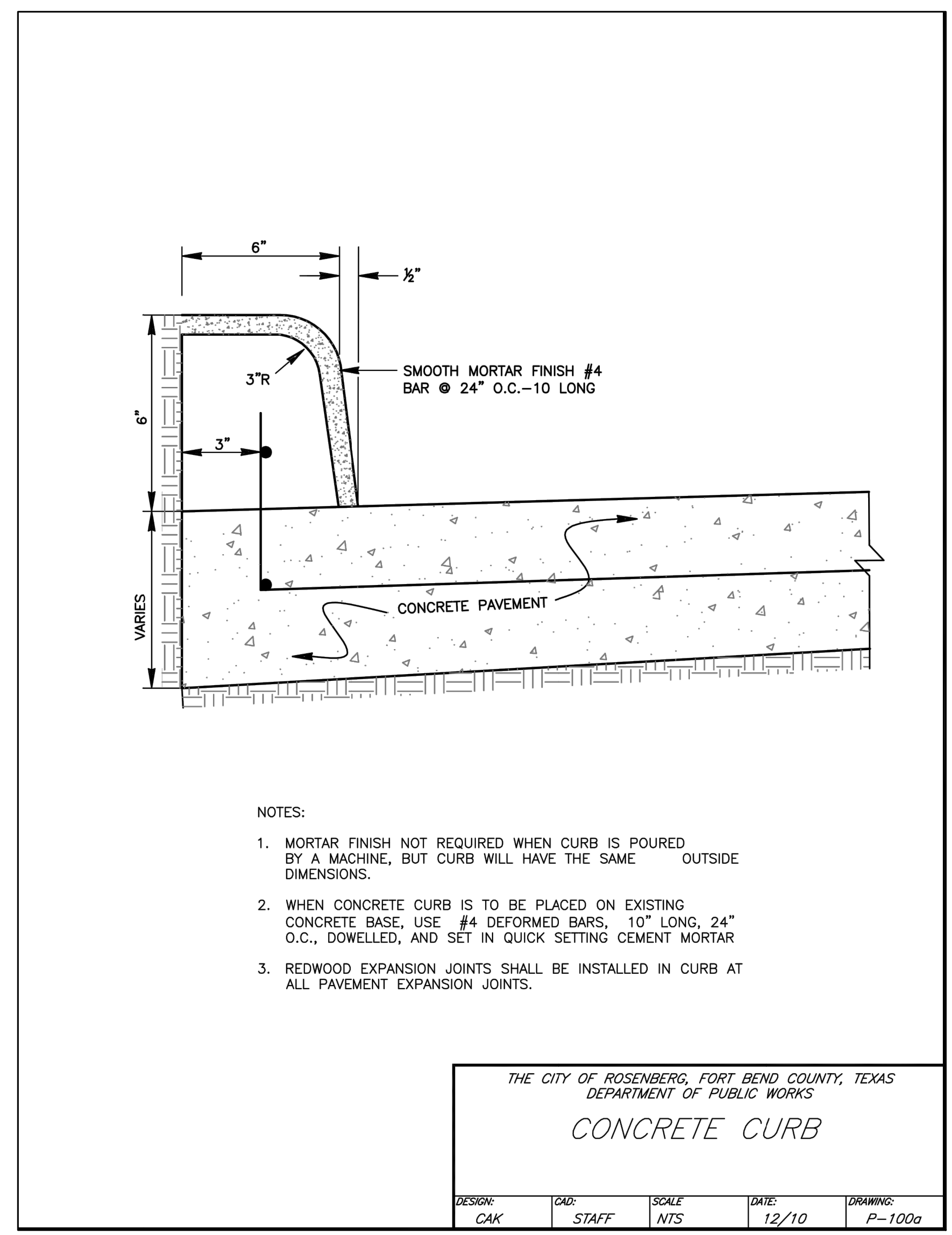
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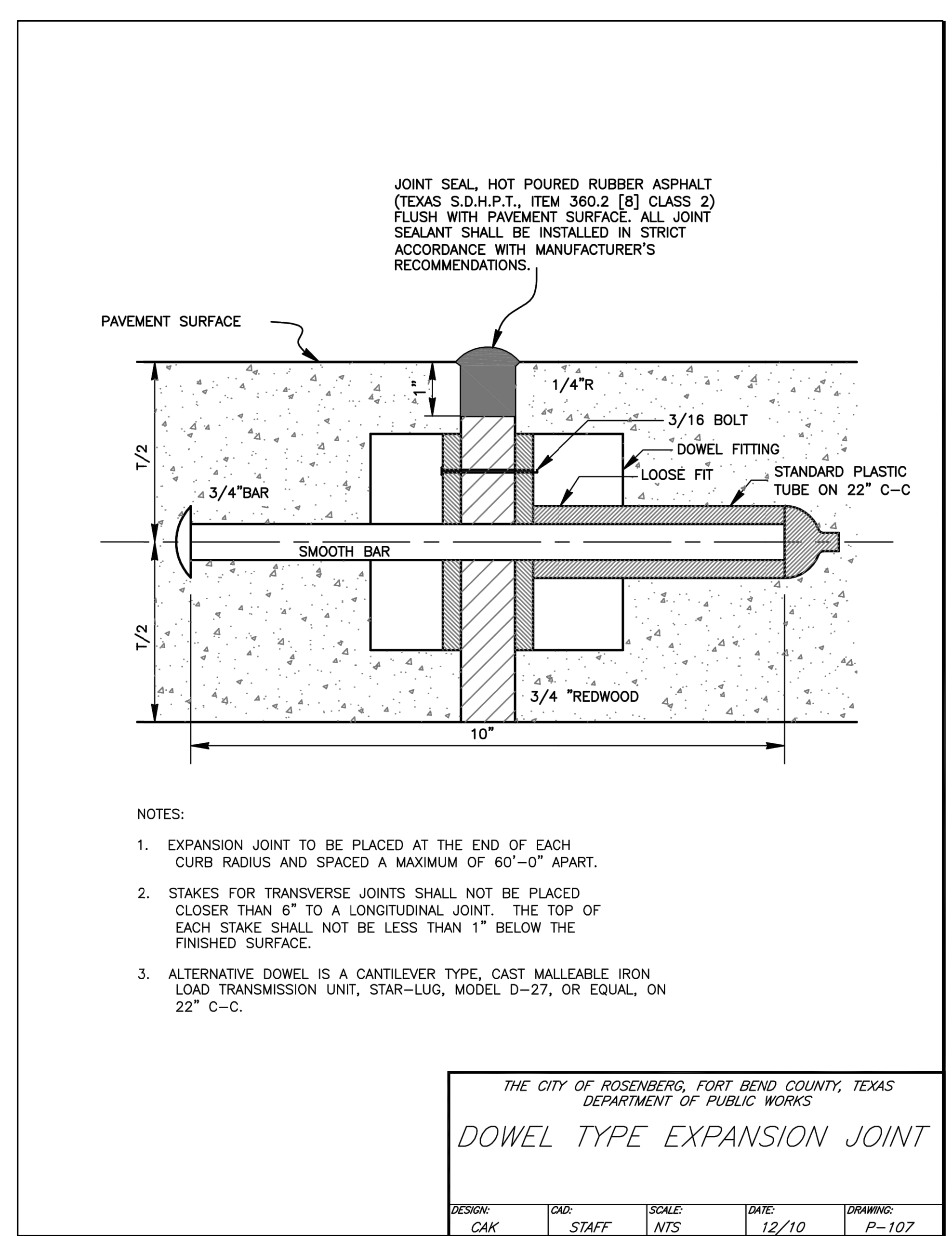
② DRIVEWAY  
N.T.S



④ STANDARD DRIVEWAY CONSTRUCTION TABLE  
N.T.S



① CONCRETE CURB  
N.T.S



③ DOWEL TYPE EXPANSION JOINT  
N.T.S





01/17/2024

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ROSENBERG, TX 77471  
FOR BID AND PERMIT

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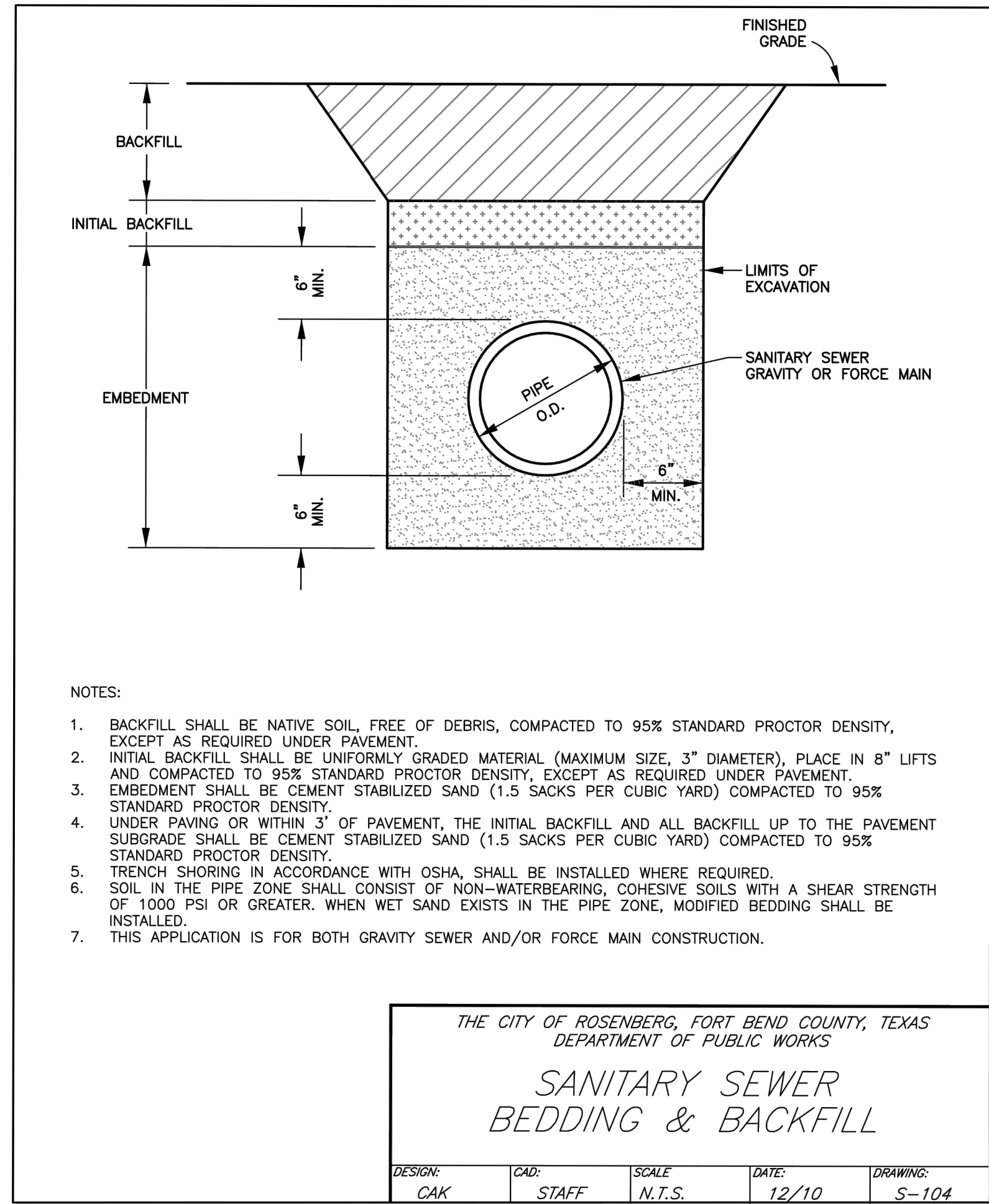
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No.	Description	Date

NTS.

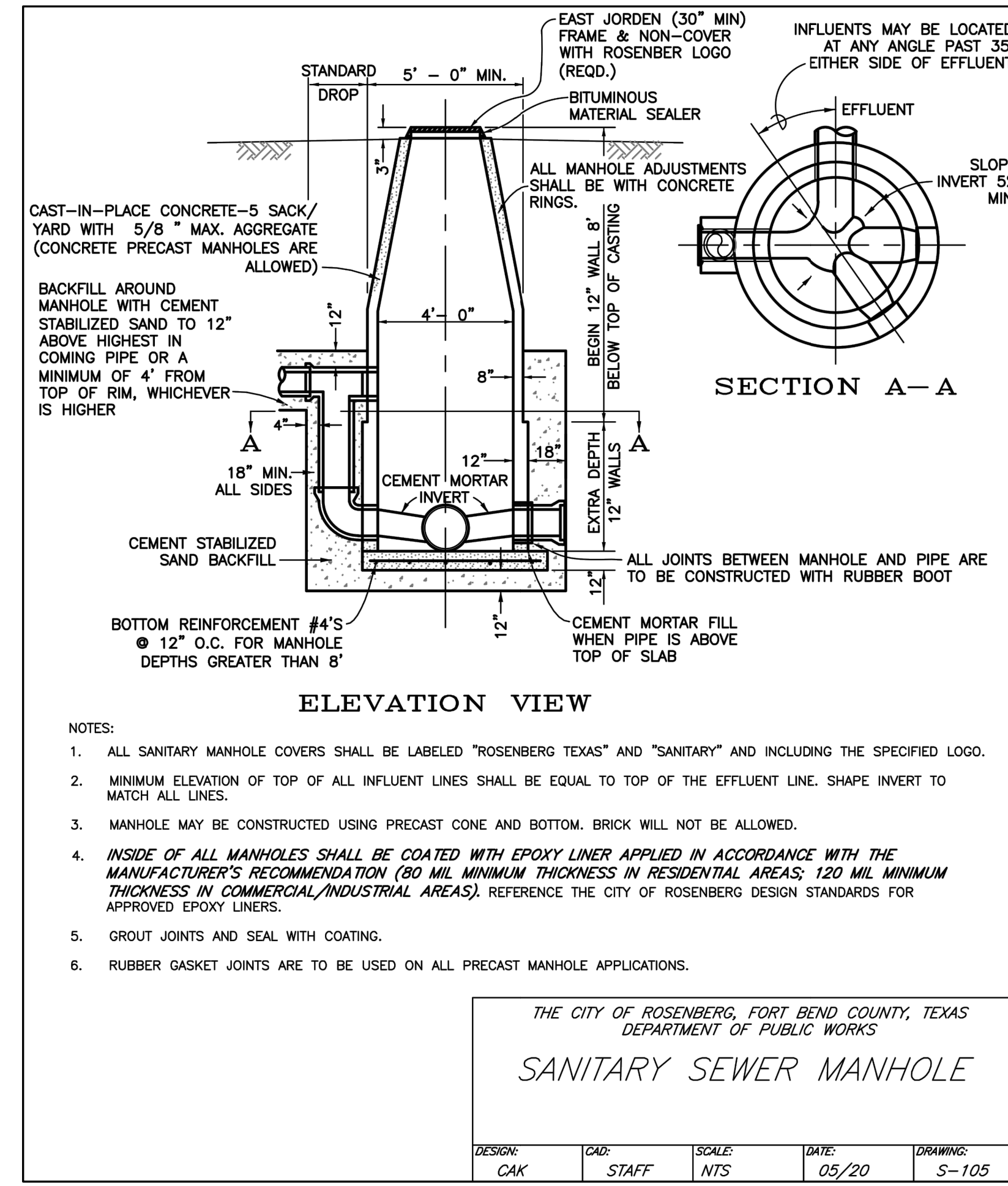
CIVIL DETAILS

C5.01

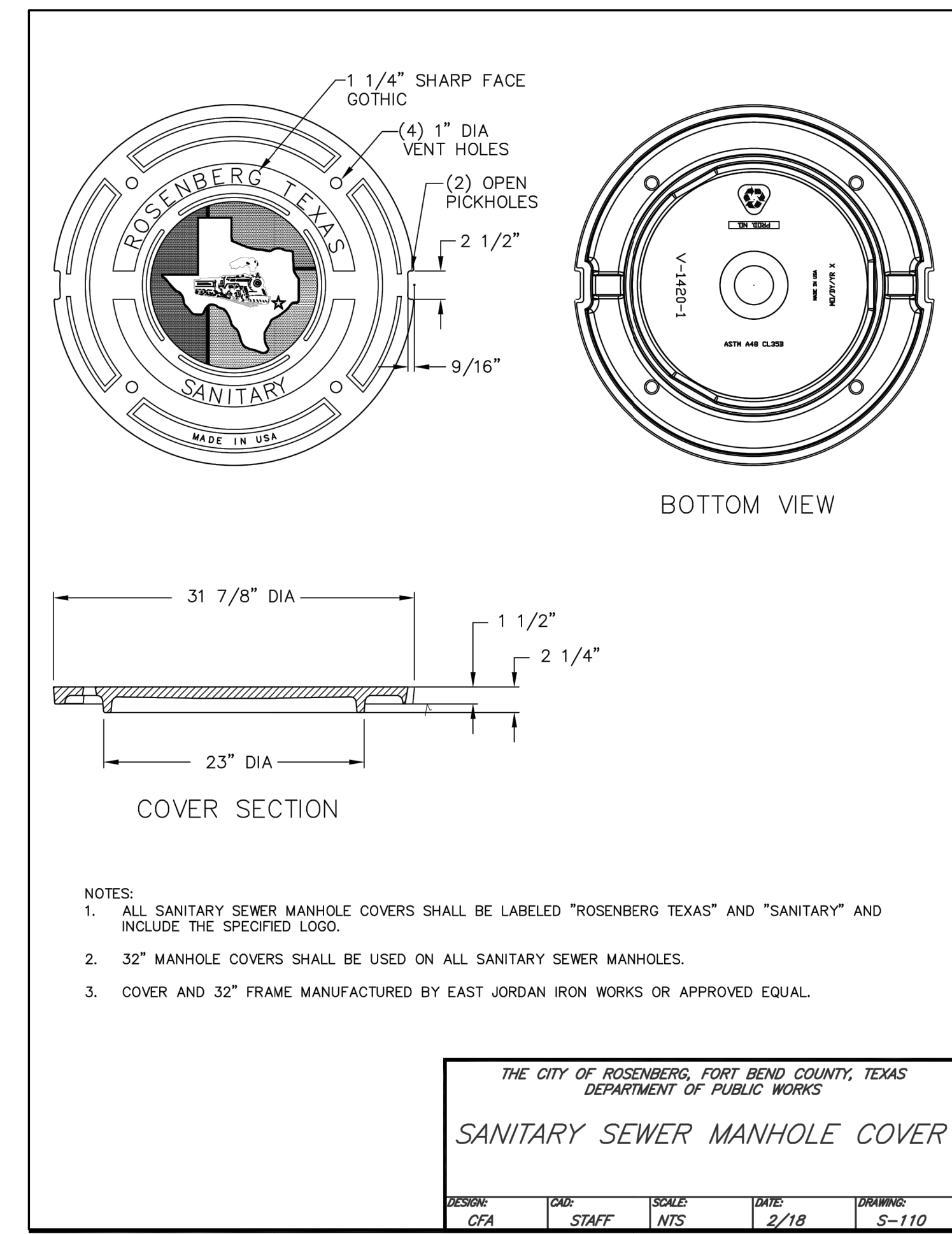
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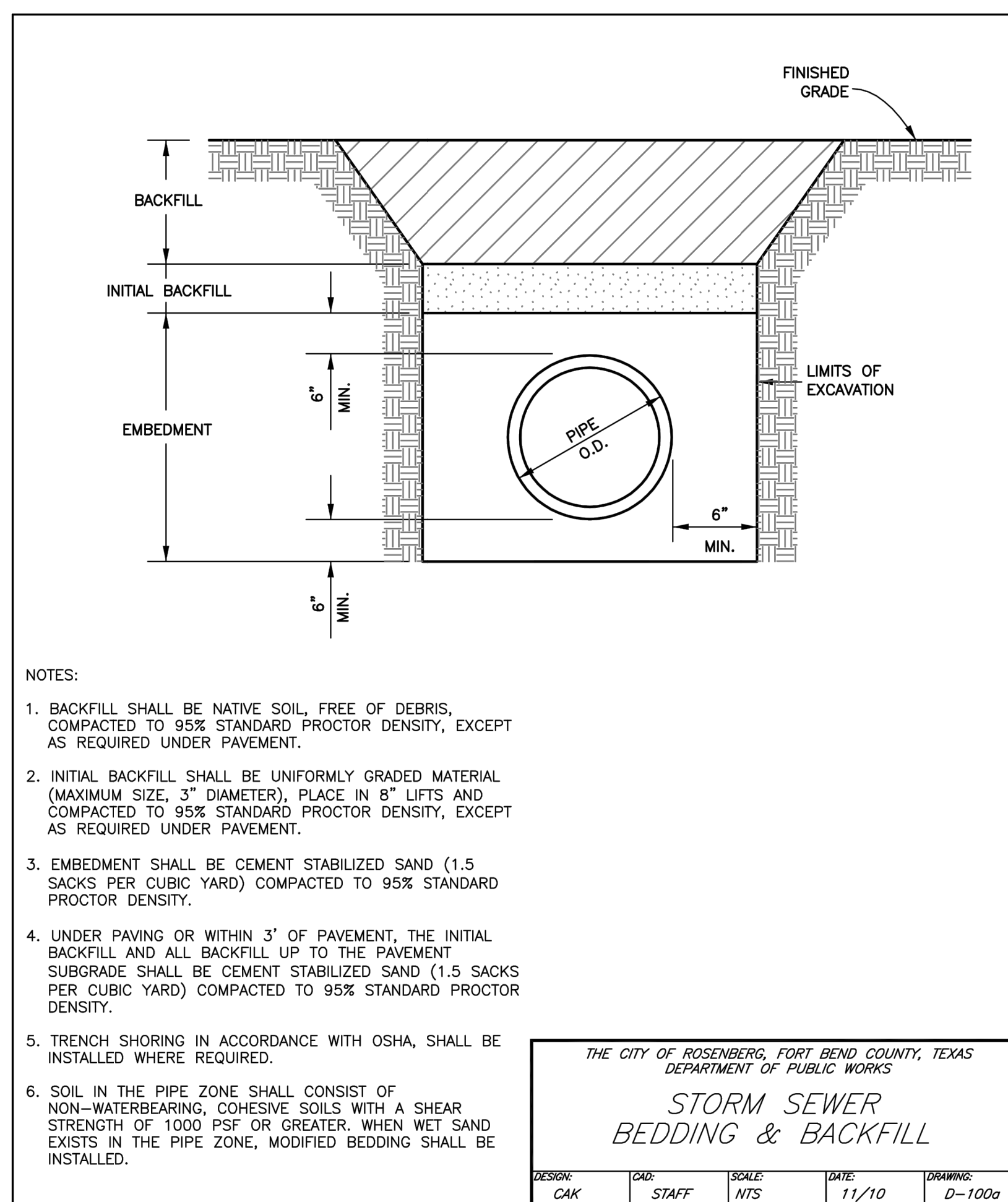
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N.T.S



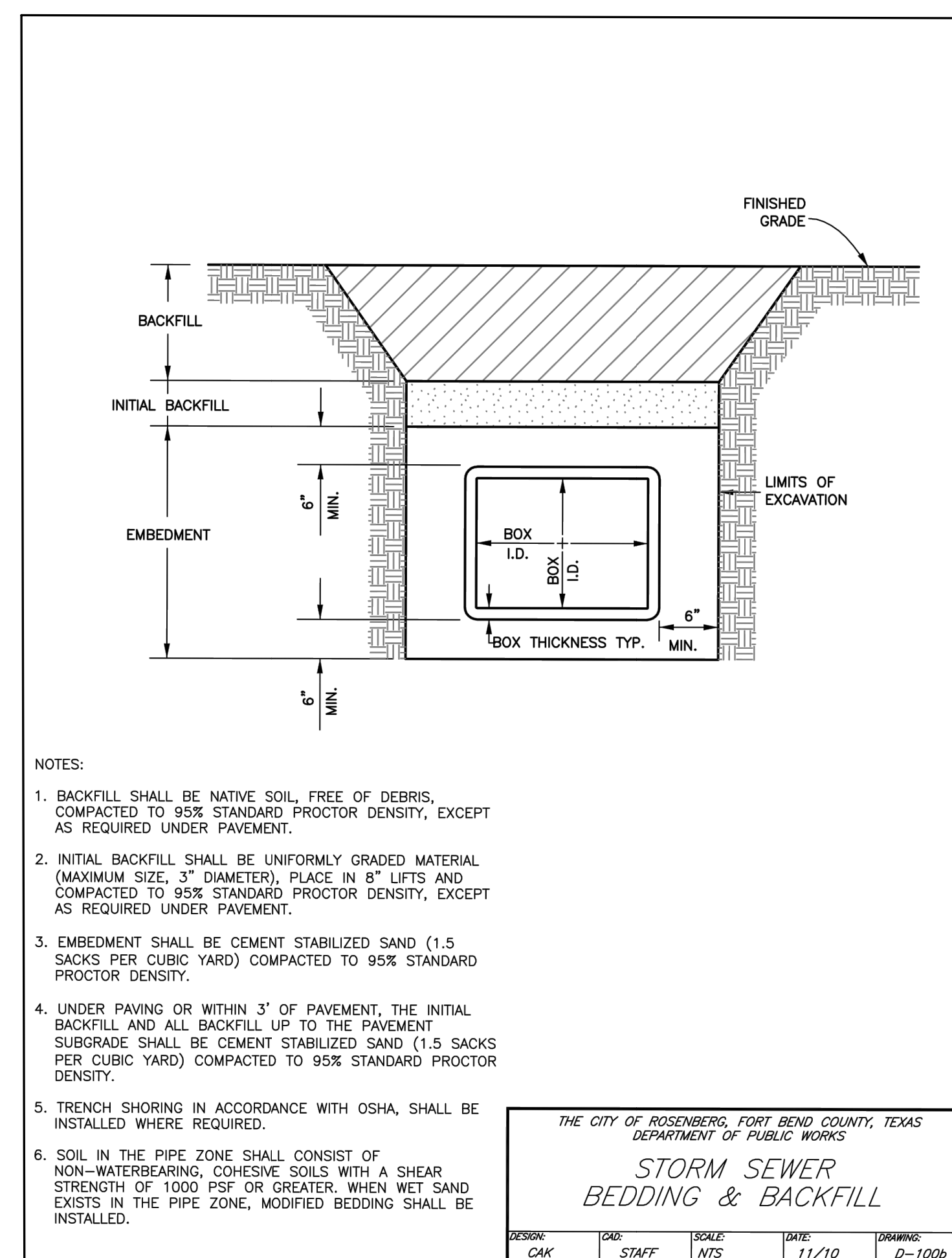
② SANITARY SEWER MANHOLE DETAIL  
N.T.S



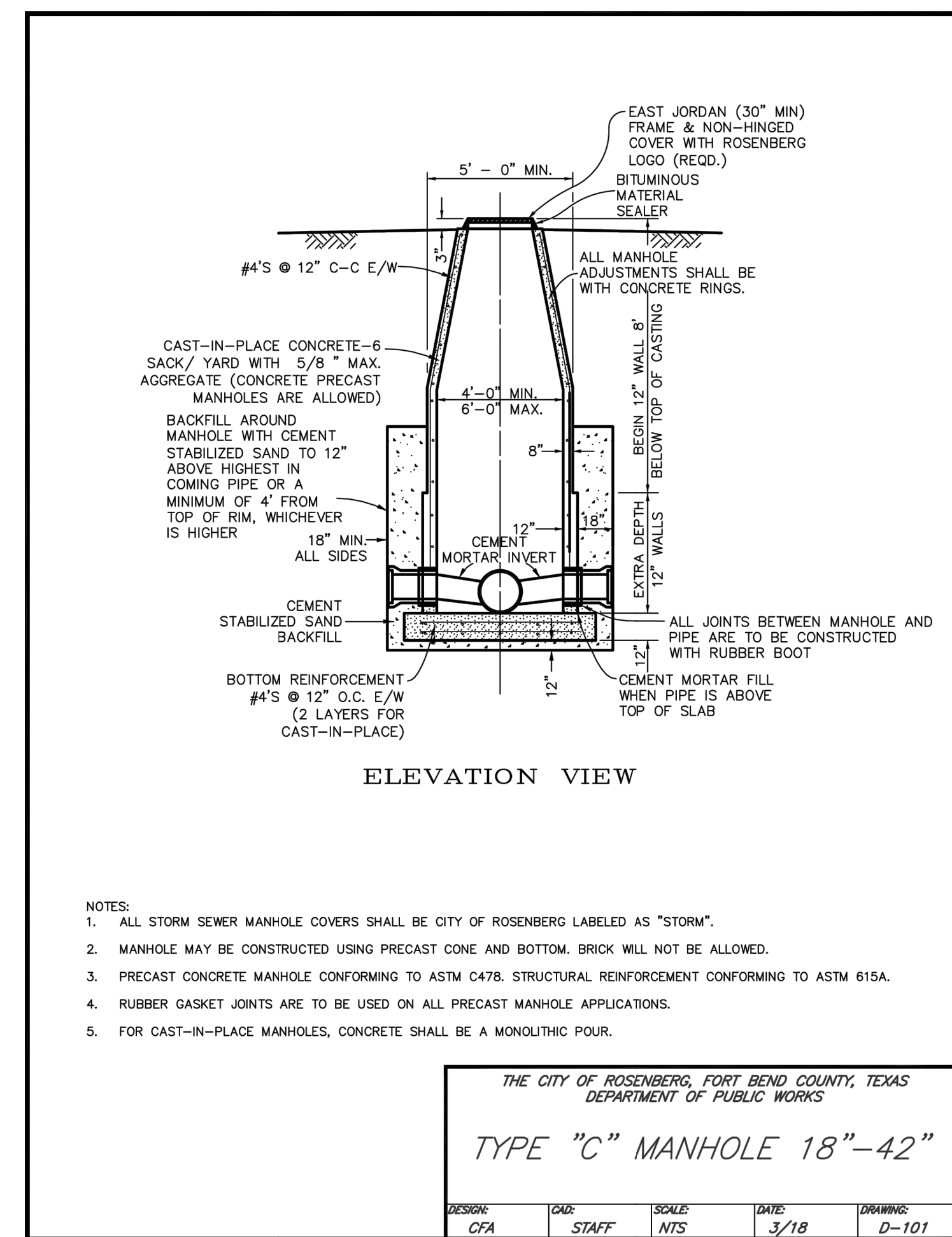
③ SANITARY SEWER MANHOLE COVER  
N.T.S



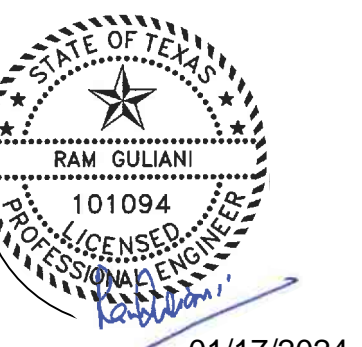
④ STORM BEDDING AND BACKFILL DETAIL  
N.T.S



⑤ STORM BEDDING AND BACKFILL DETAIL  
N.T.S



⑥ TYPE "C" MANHOLE 15"-42"  
N.T.S



01/17/2024

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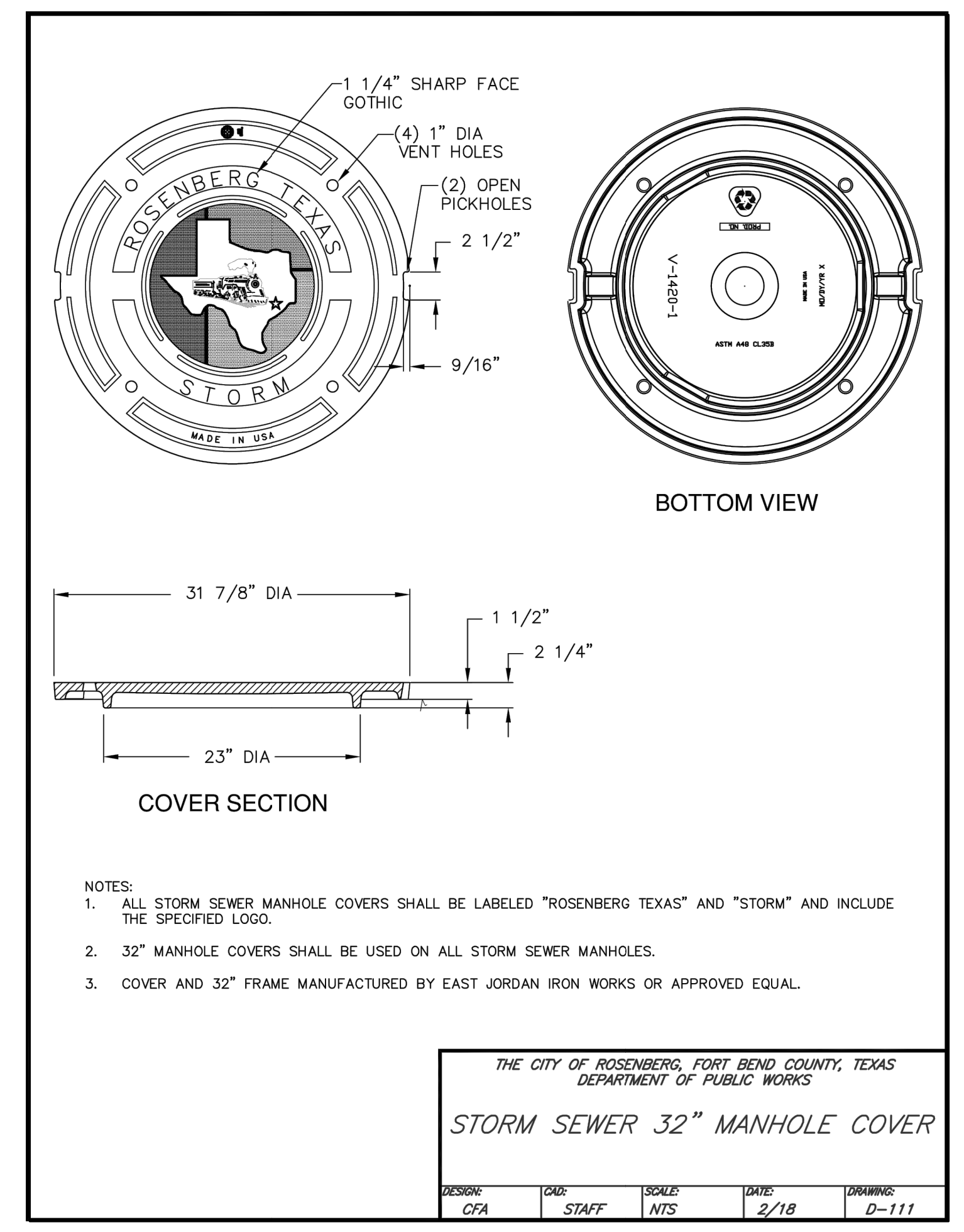
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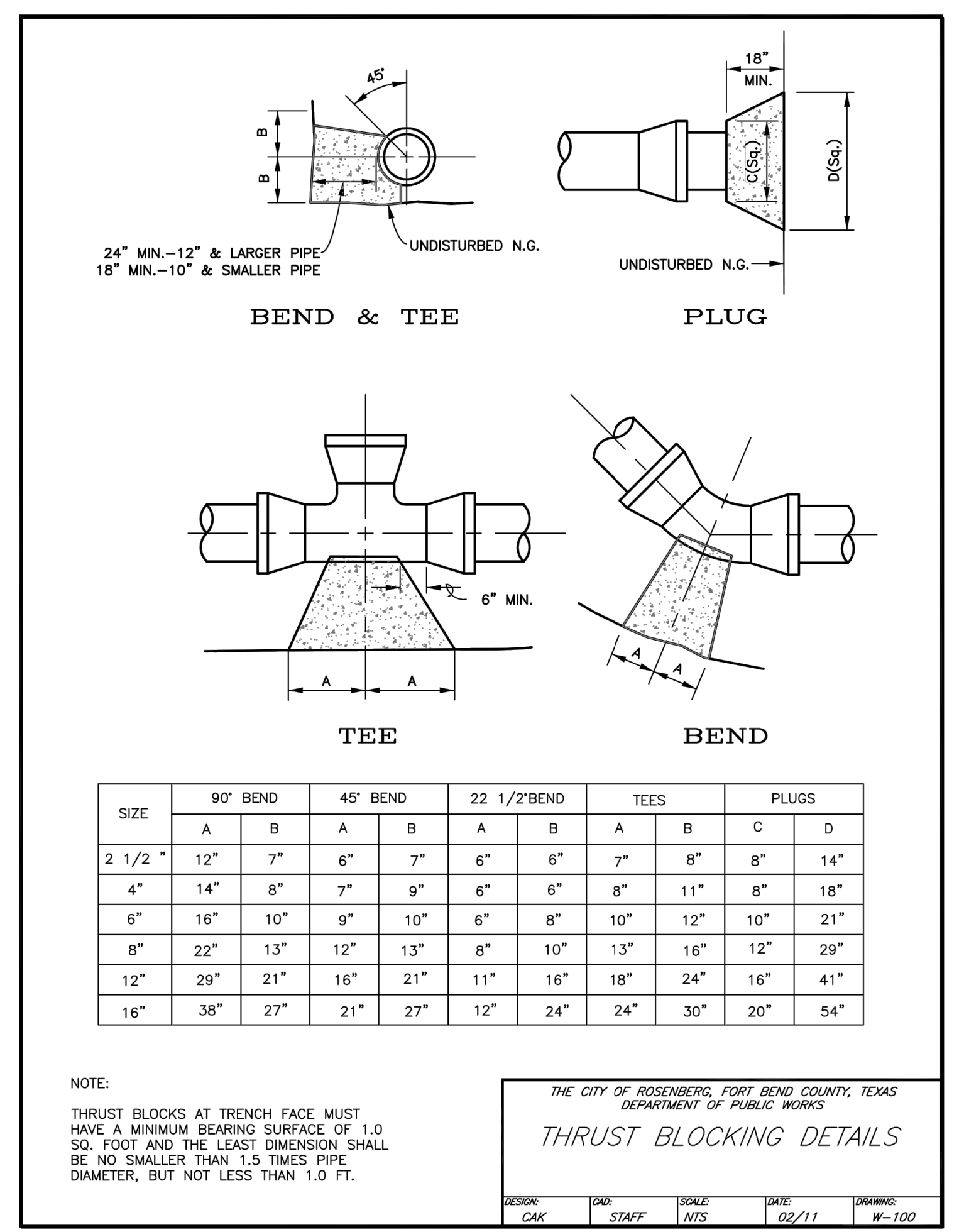
MEP CONSULTANT:  
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FBC Elections Administration Building

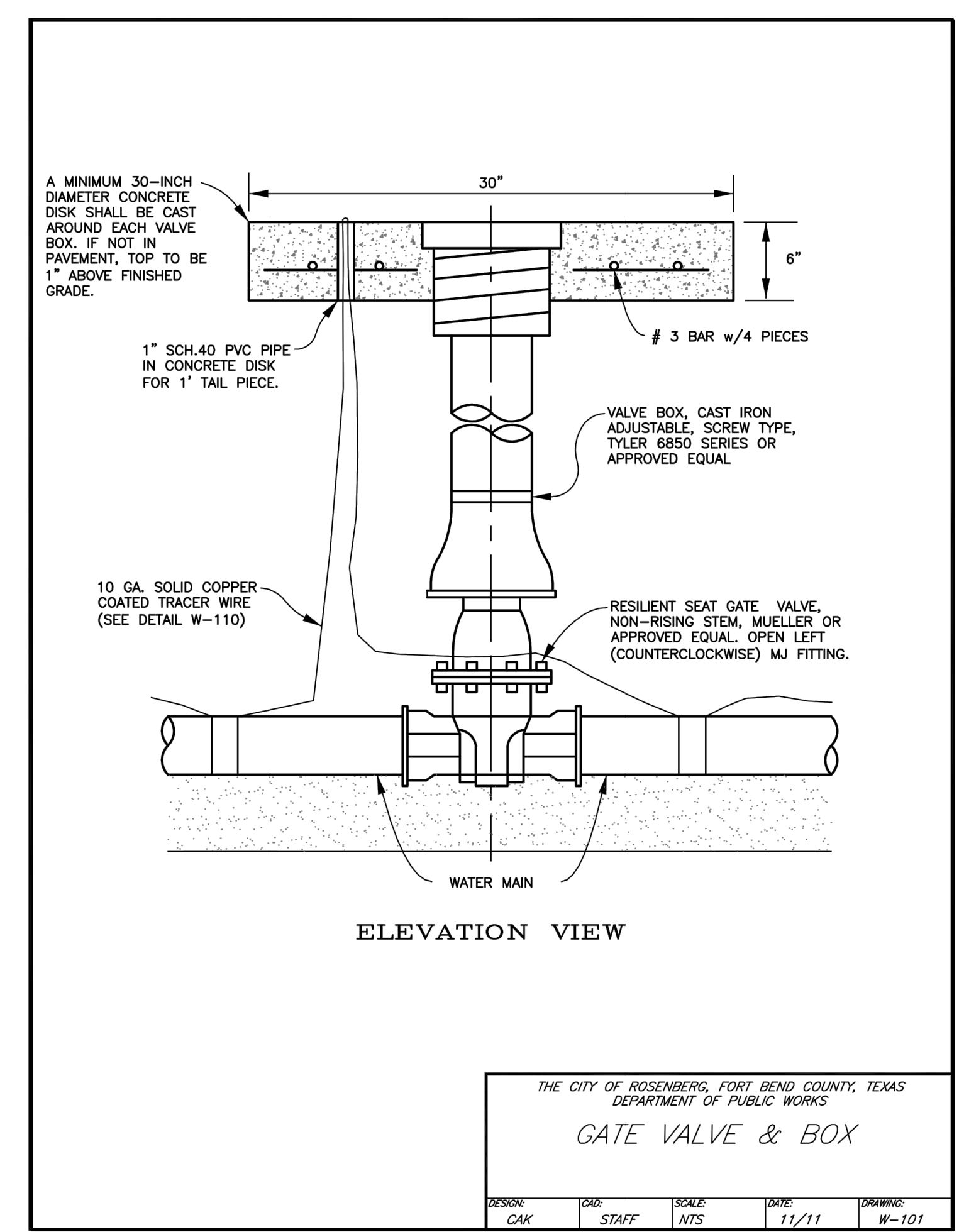
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ROSENBERG, TX. 77471  
FOR BID AND PERMIT



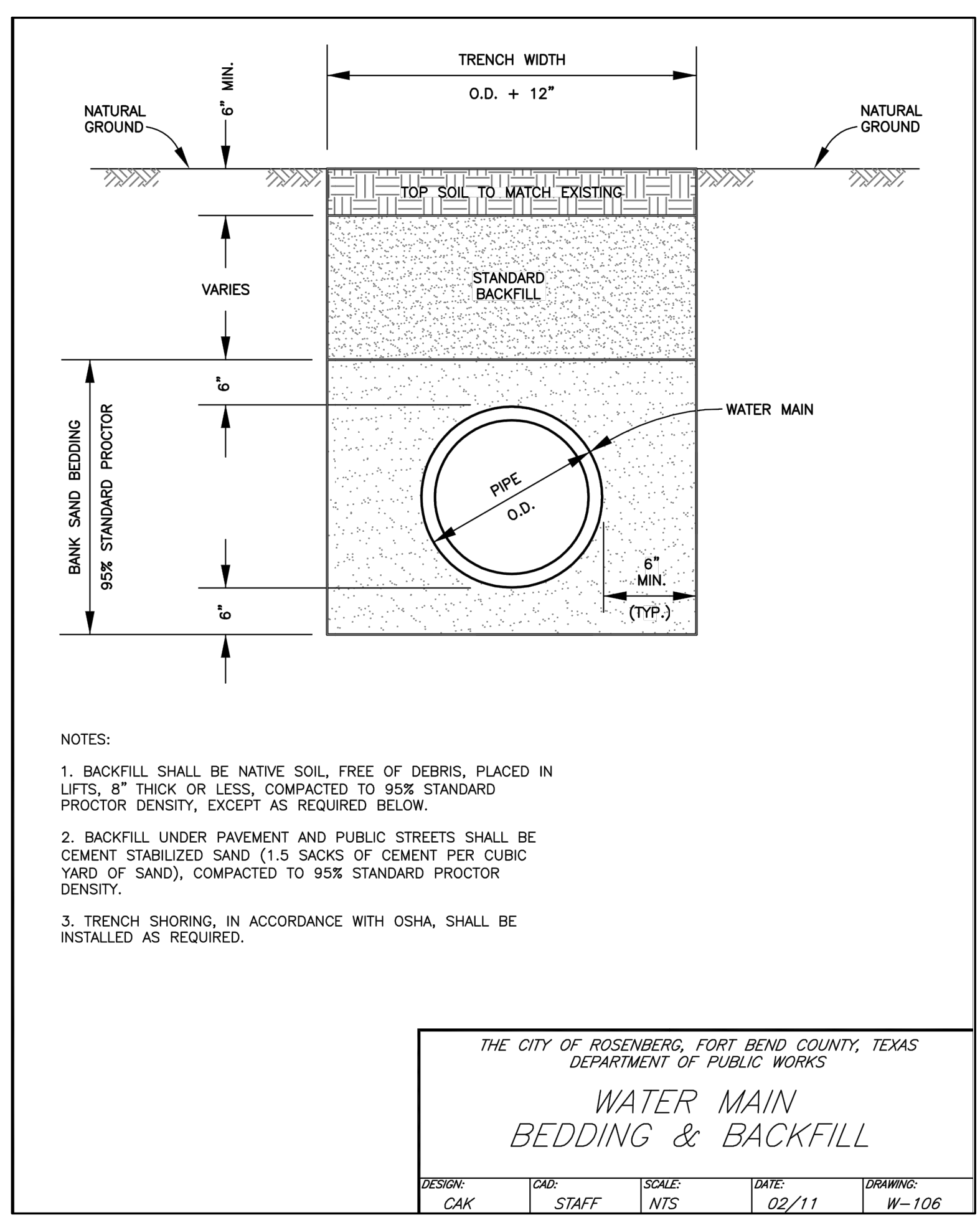
1 STORM SEWER 32" MANHOLE COVER N.T.S



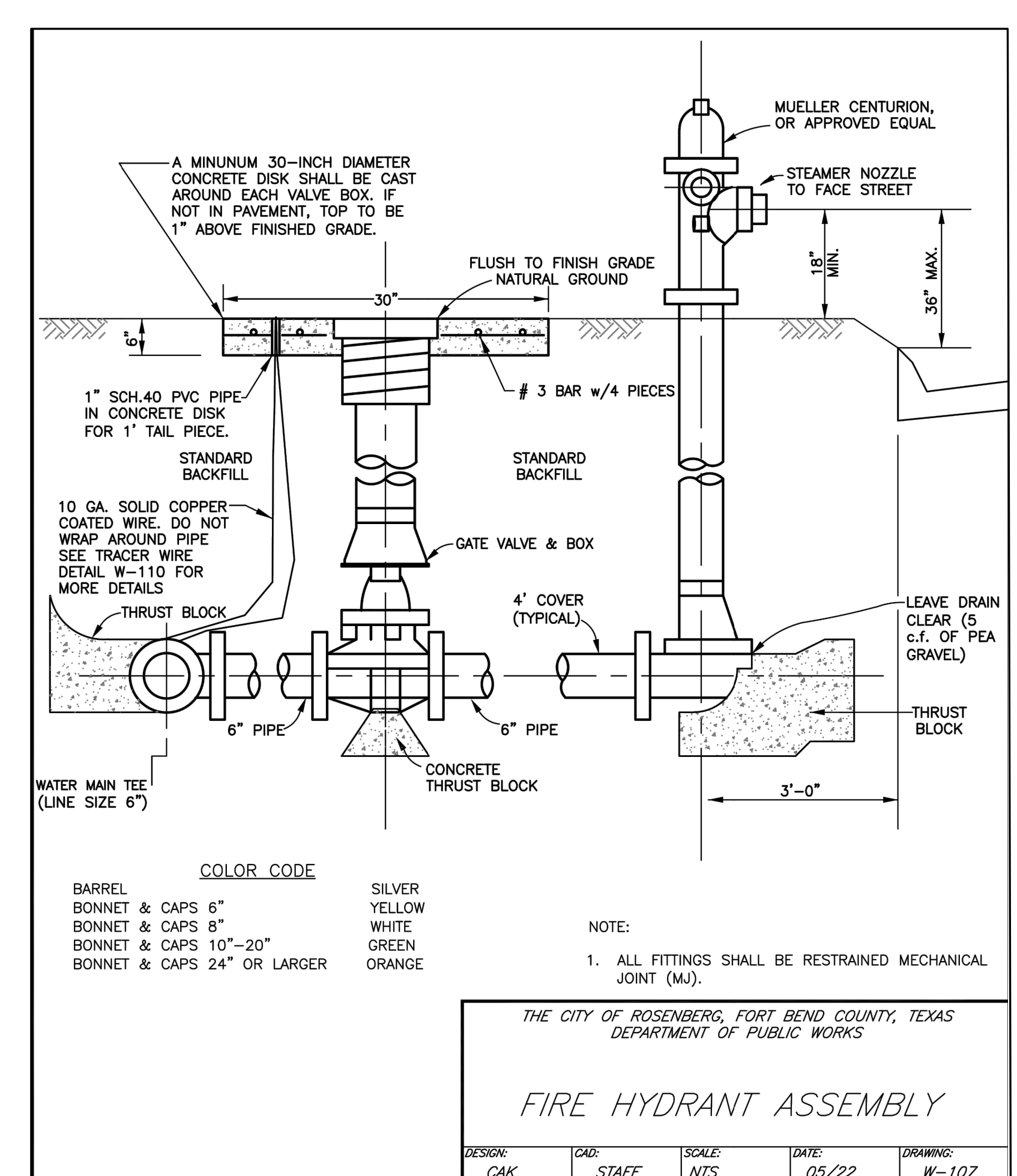
2 THRUST BLOCKING DETAILS N.T.S



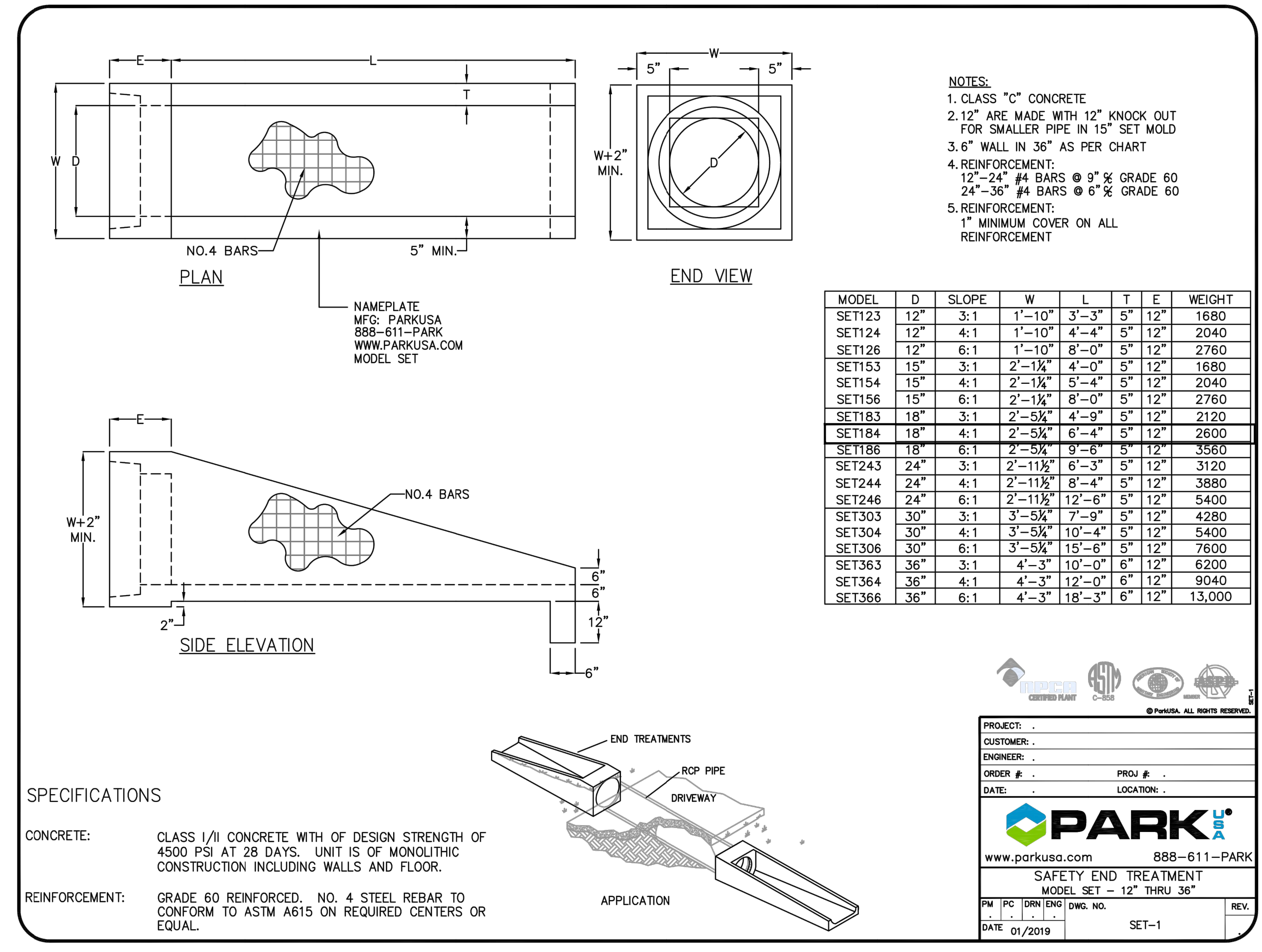
3 GATE VALVE & BOX N.T.S



4 WATER BEDDING AND BACKFILL DETAIL N.T.S



5 FIRE HYDRANT DETAIL N.T.S



6 SAFETY AND TREATMENT FOR CULVERTS DETAIL N.T.S

Issue Log:

No.	Descriptor	Date

Revisions:

No.	Description	Date

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Project No.: 2330

Drawing Date: 01.17.2024  
Drawn: RR  
Checked: DM  
Scale: AS NOTED

Issue Log:

No.	Descriptor	Date

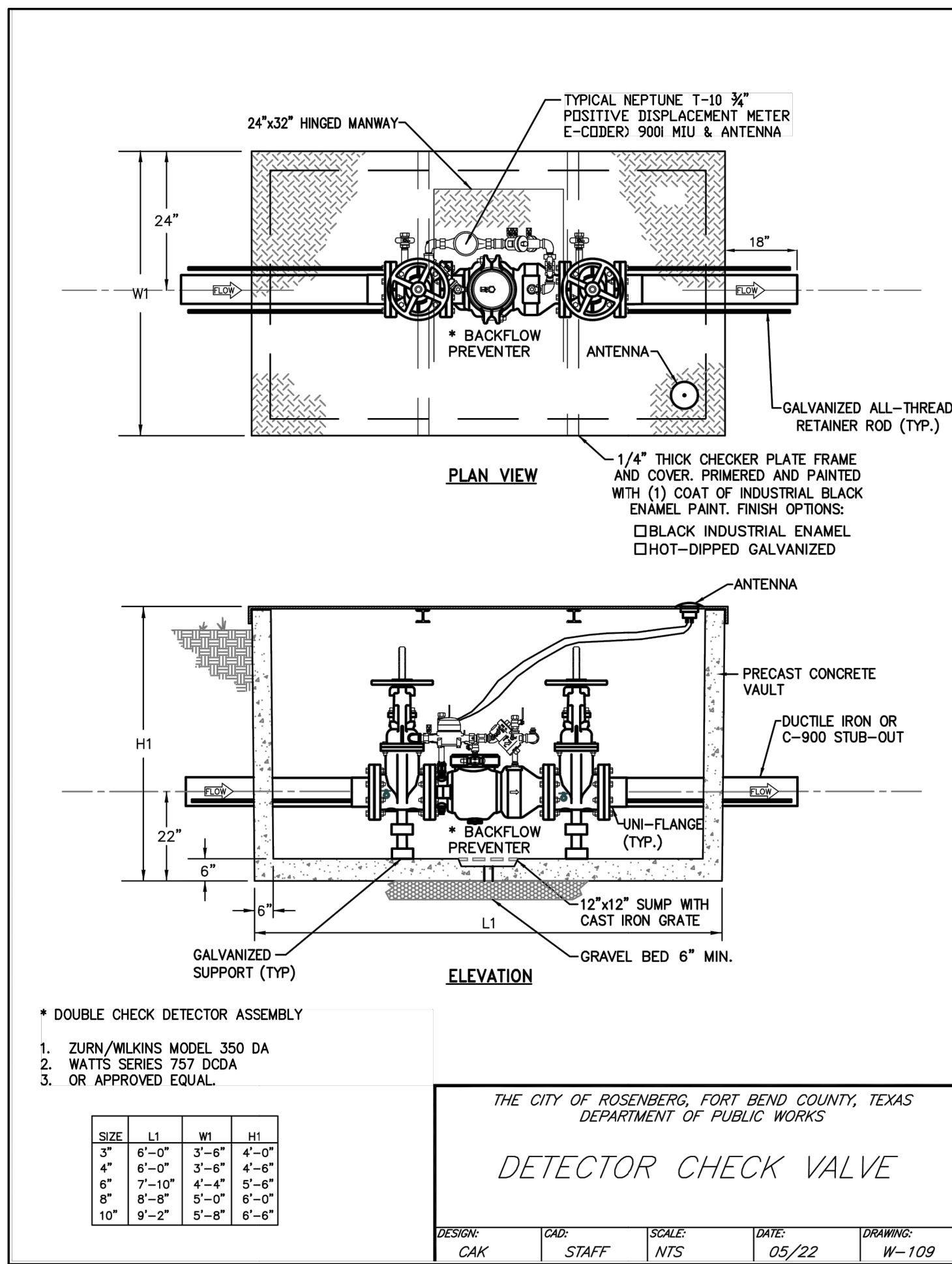
Revisions:

No.	Description	Date

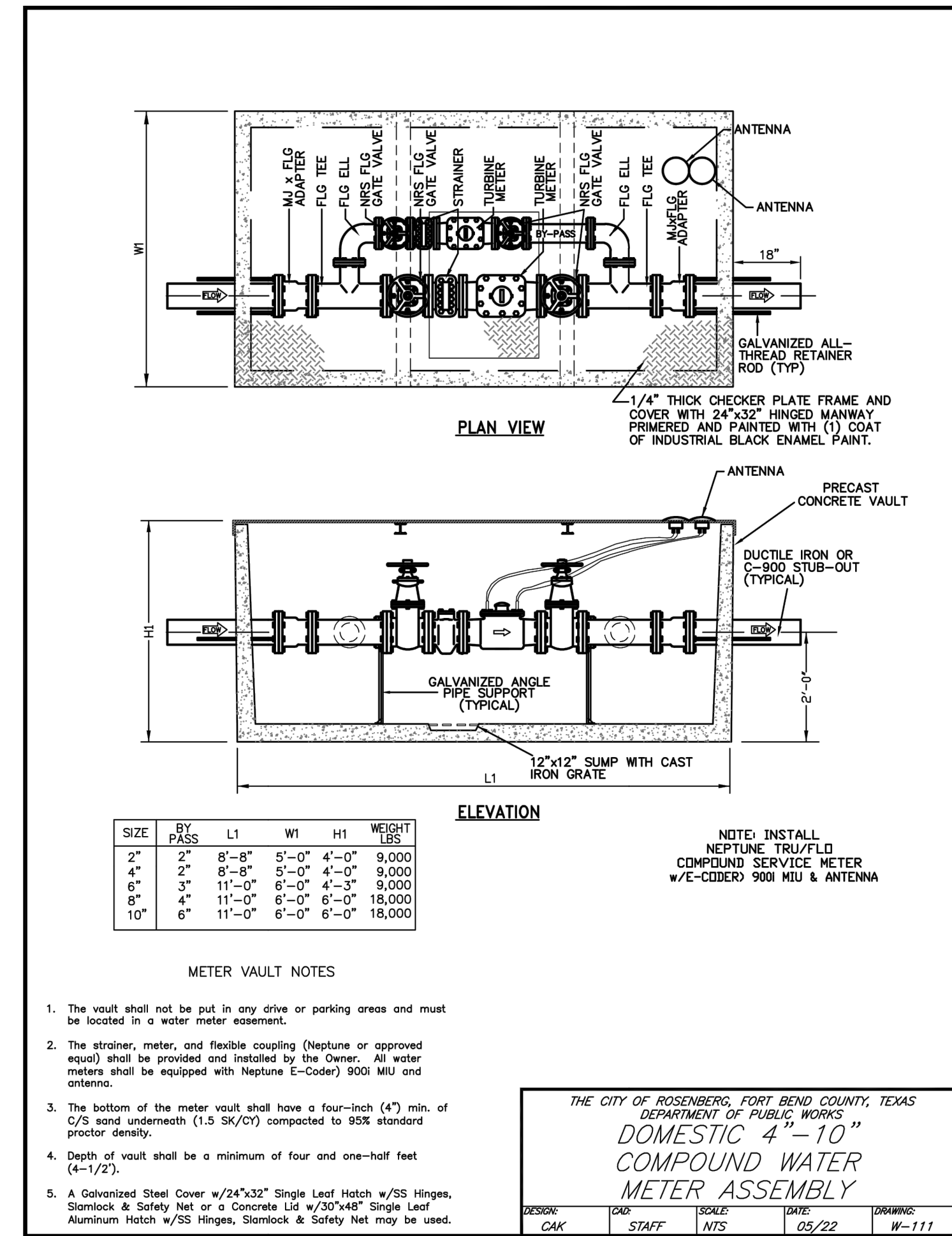
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CIVIL DETAILS

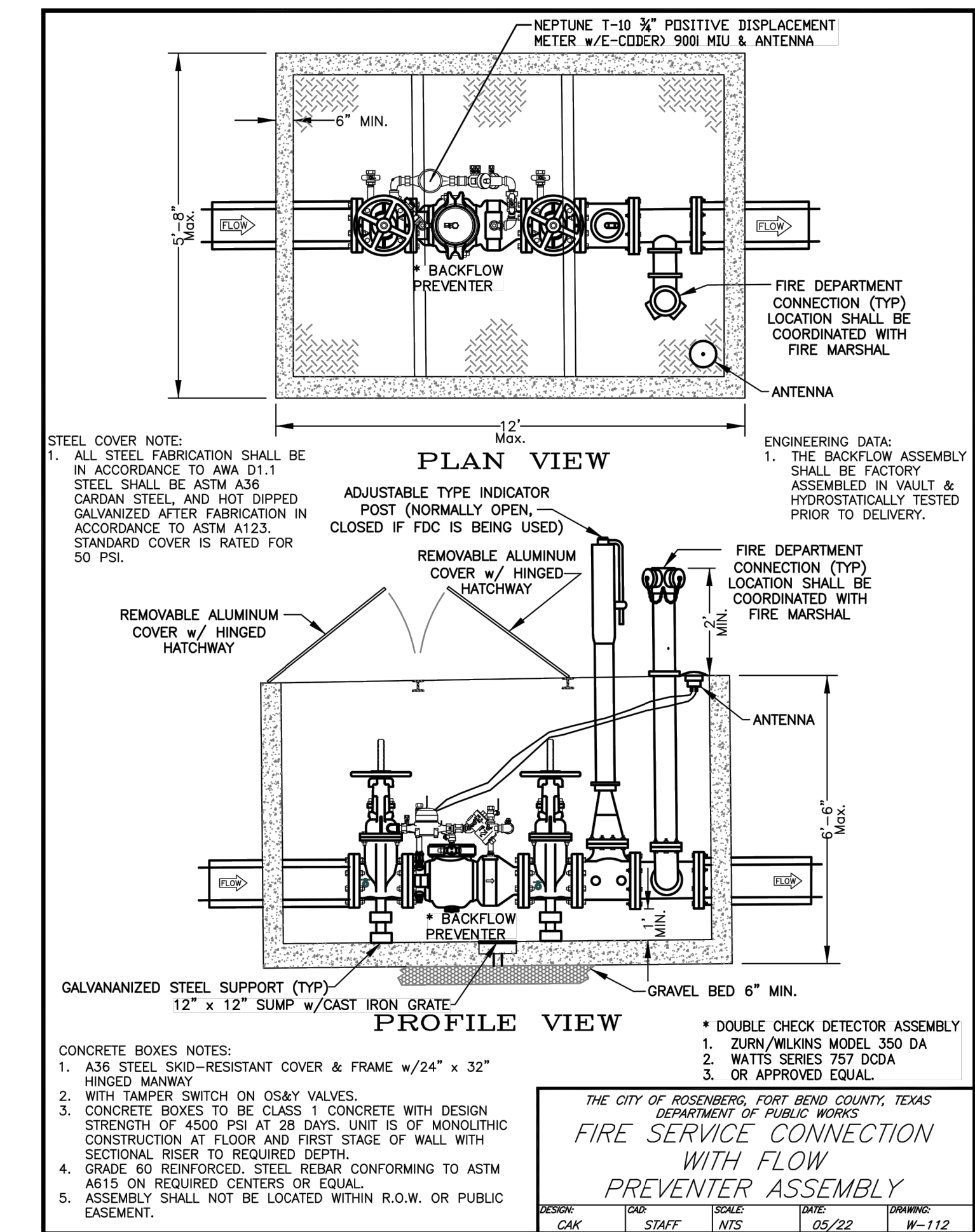
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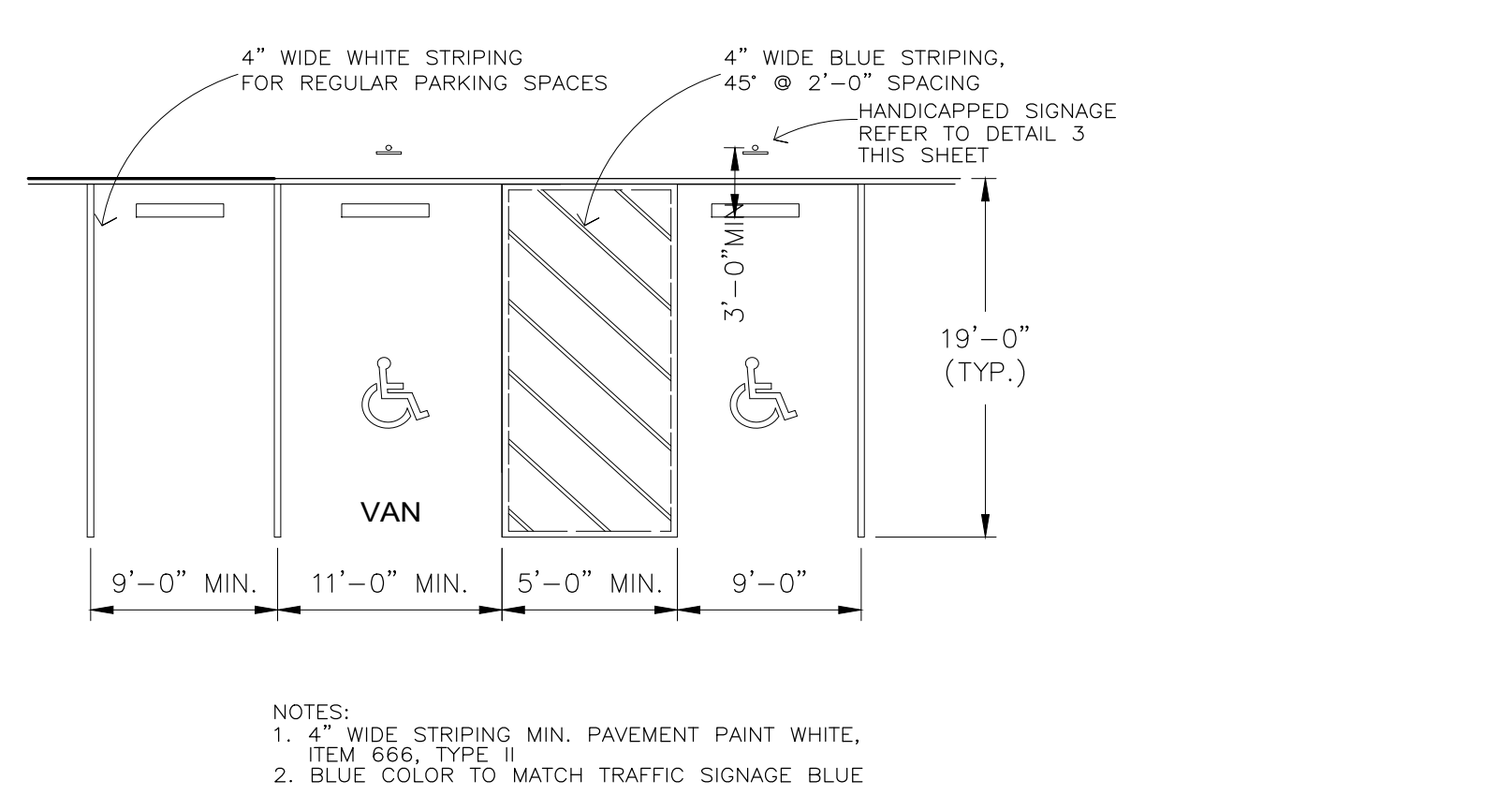
1 DETECTOR CHECK VALVE  
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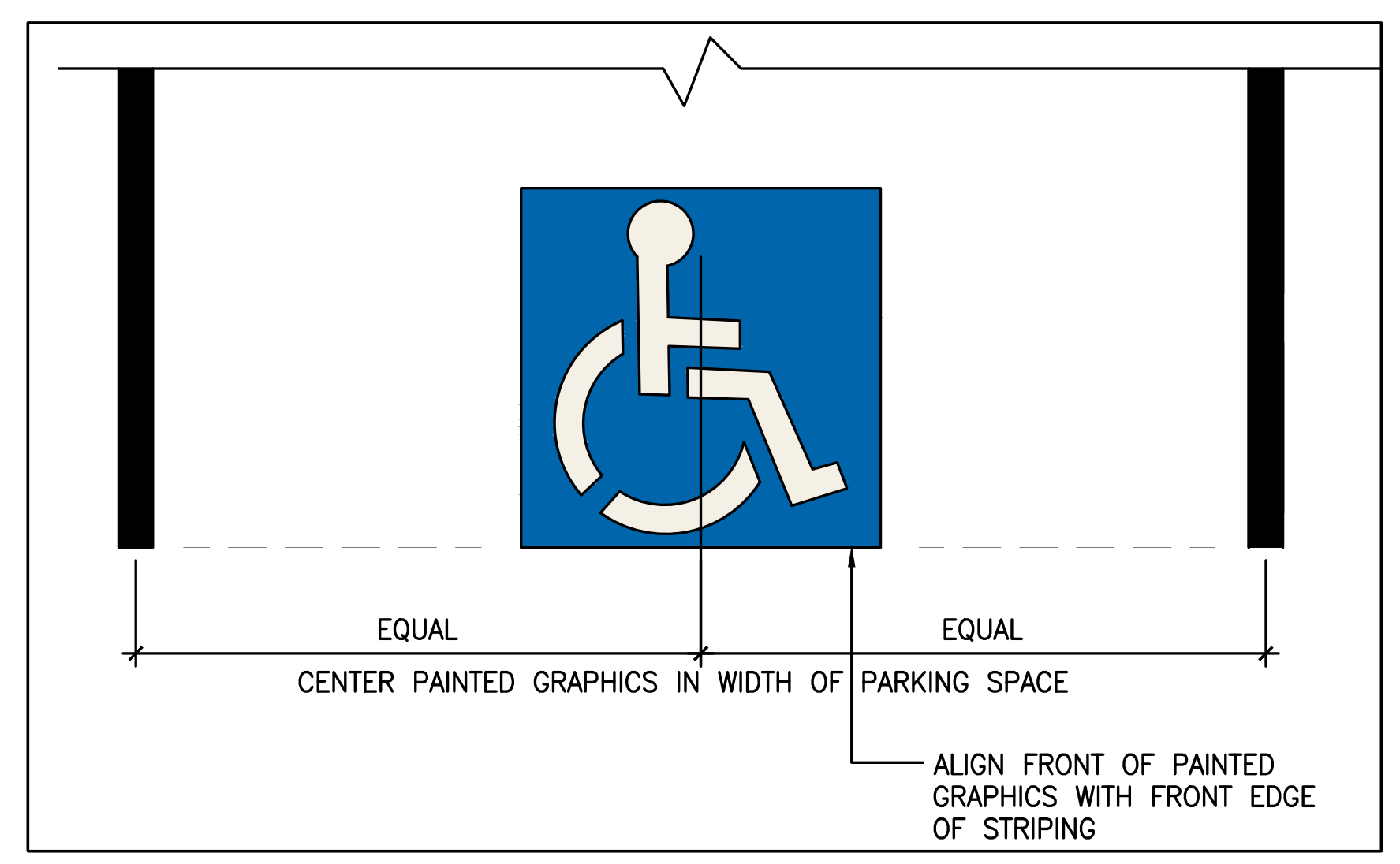
2 DOMESTIC 4"-10" COMPOUND WMA  
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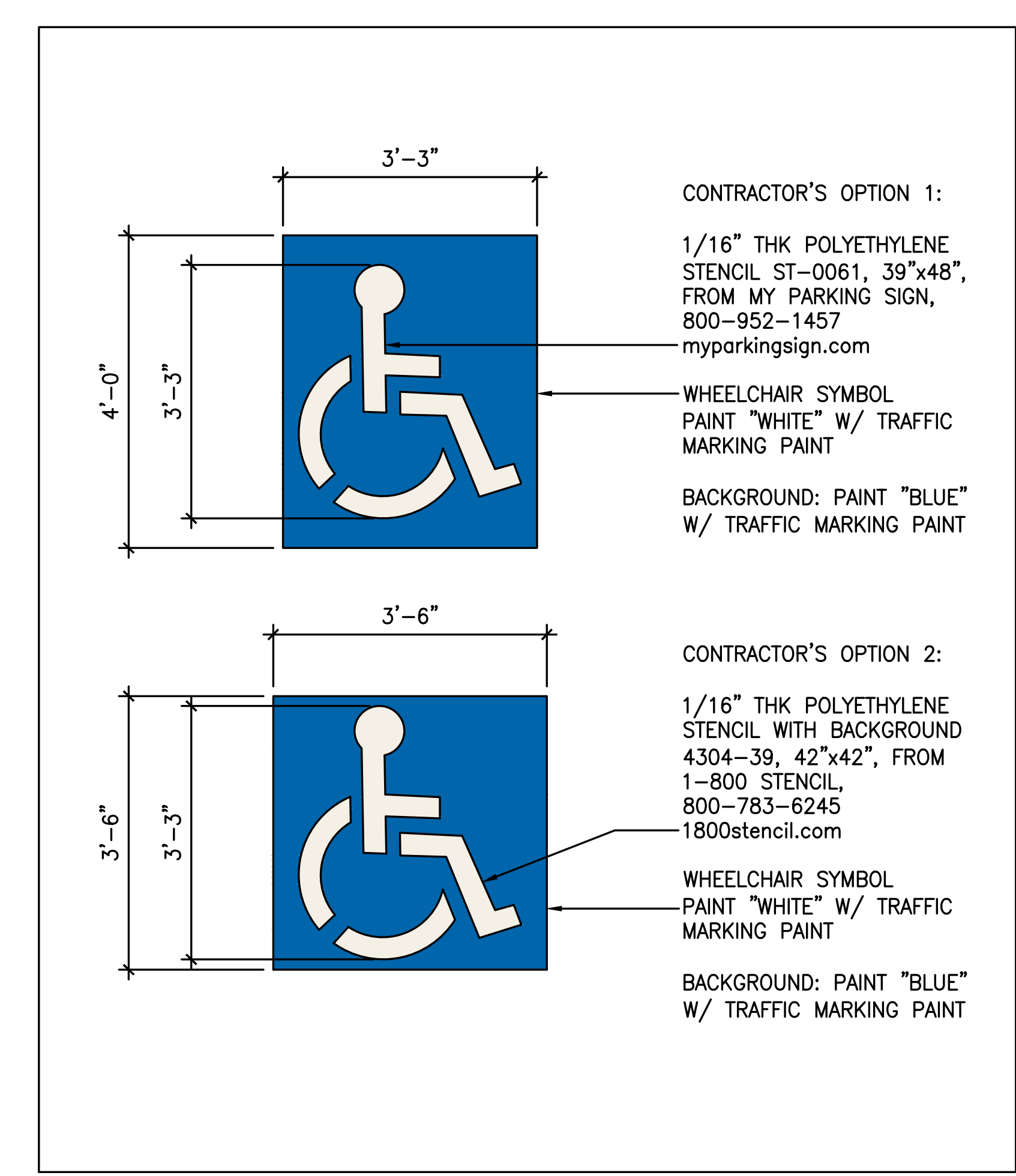
3 FIRE SERVICE CONNECTION W/ FPA  
N.T.S



5 HANDICAP PARKING AND STRIPE DETAILS  
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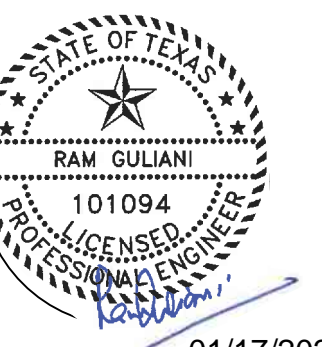


6A PAINTED GRAPHICS ALIGNMENT  
SCALE: NTS



1B PAINTED WHEELCHAIR GRAPHIC AT ACCESSIBLE PARKING  
SCALE: NTS

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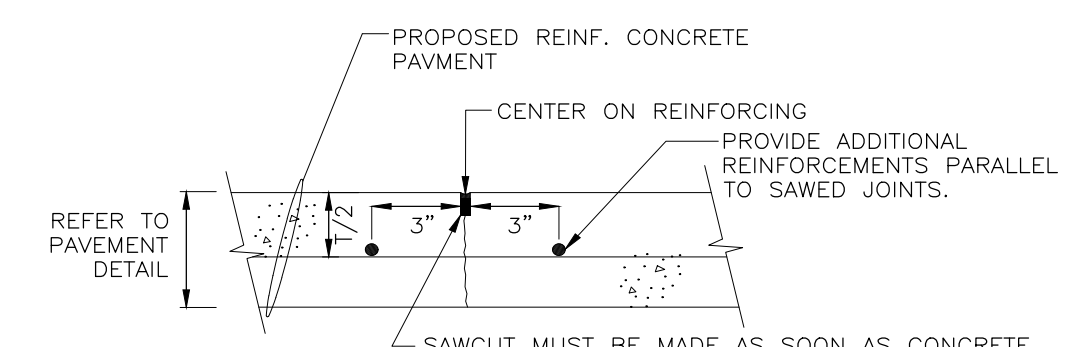
NTS.  
CIVIL DETAILS

C5.04

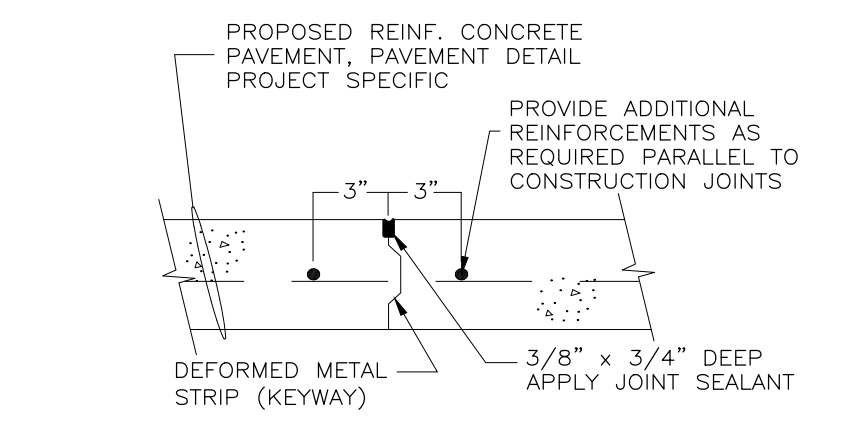
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**PAVING/JOINTING NOTES:-**

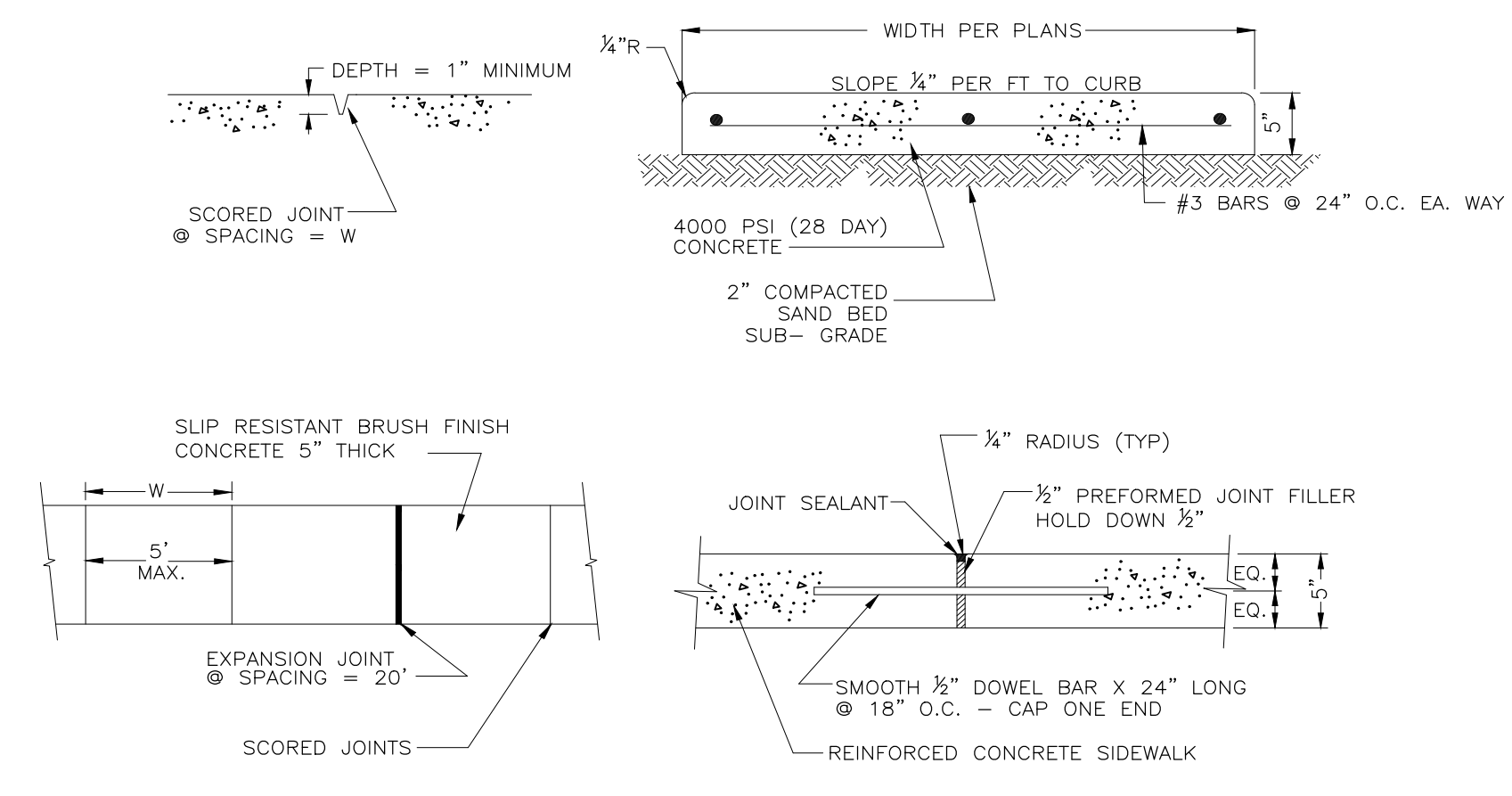
- REINFORCING STEEL: STEEL BARS SHALL BE GRADE 60 6" THICK CONCRETE: #4 BARS SPACED AT 18 INCHES ON CENTERS IN BOTH DIRECTIONS.
- CONTROL JOINT SPACING: MAXIMUM OF 15 FEET. IF SAWCUT, CONTROL JOINTS SHOULD BE CUT WITHIN 4 TO 12 HOURS OF CONCRETE PLACEMENT.
- EXPANSION JOINT SPACING: MAXIMUM OF 80 FEET.
- EXPANSION JOINTS: 3/4 INCH BARS, 18 INCHES IN LENGTH, WITH ONE END TREATED TO SLIP, SPACED AT 12 INCHES ON CENTER AT EACH JOINT.
- REINFORCED CONCRETE PAVEMENT - THE PORTLAND CEMENT CONCRETE MIX SHOULD HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI, AND A MINIMUM OF THREE PERCENT ENTRAINED AIR.
- CURBS ARE 6 INCHES IN HEIGHT UNLESS NOTED OTHERWISE.



**3 CONTROL JOINT**  
SCALE: NTS

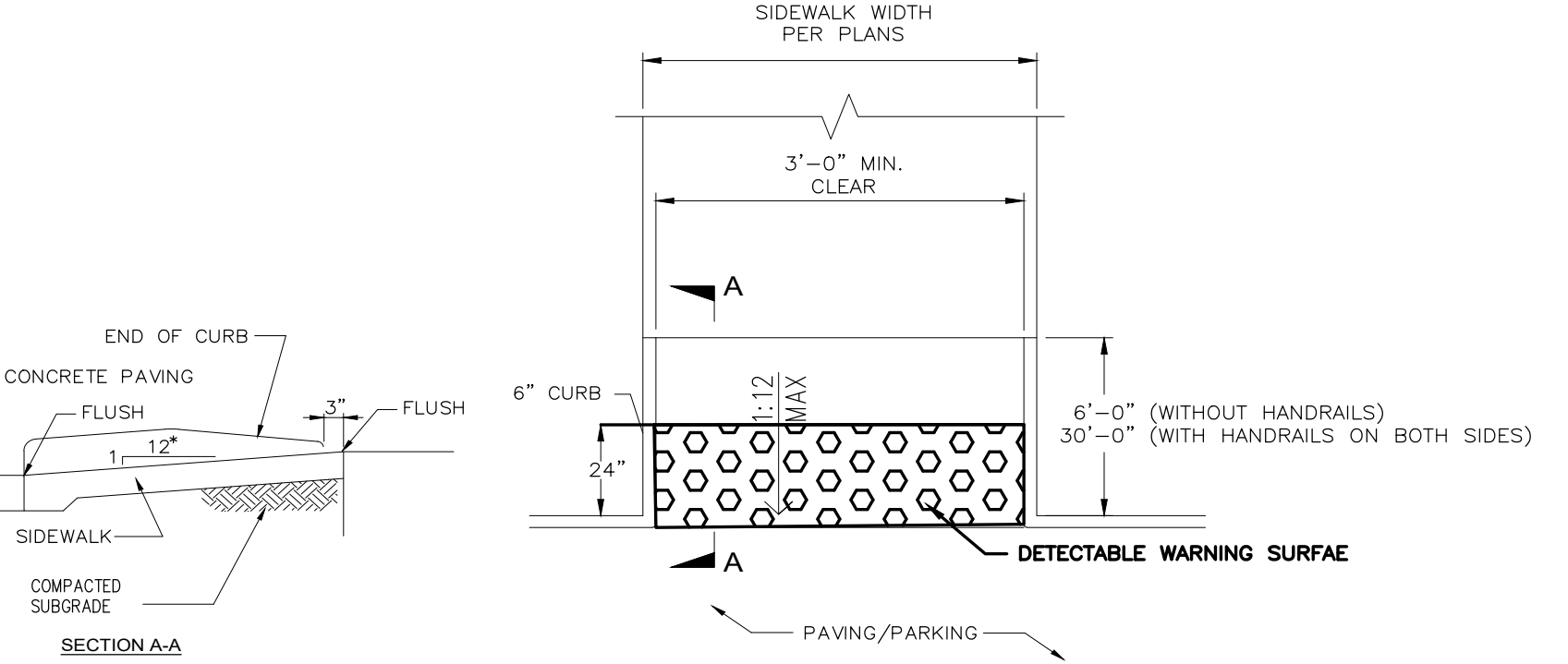


**6 CONSTRUCTION JOINT**  
SCALE: NTS



**1 SIDEWALK DETAILS**  
SCALE: NTS

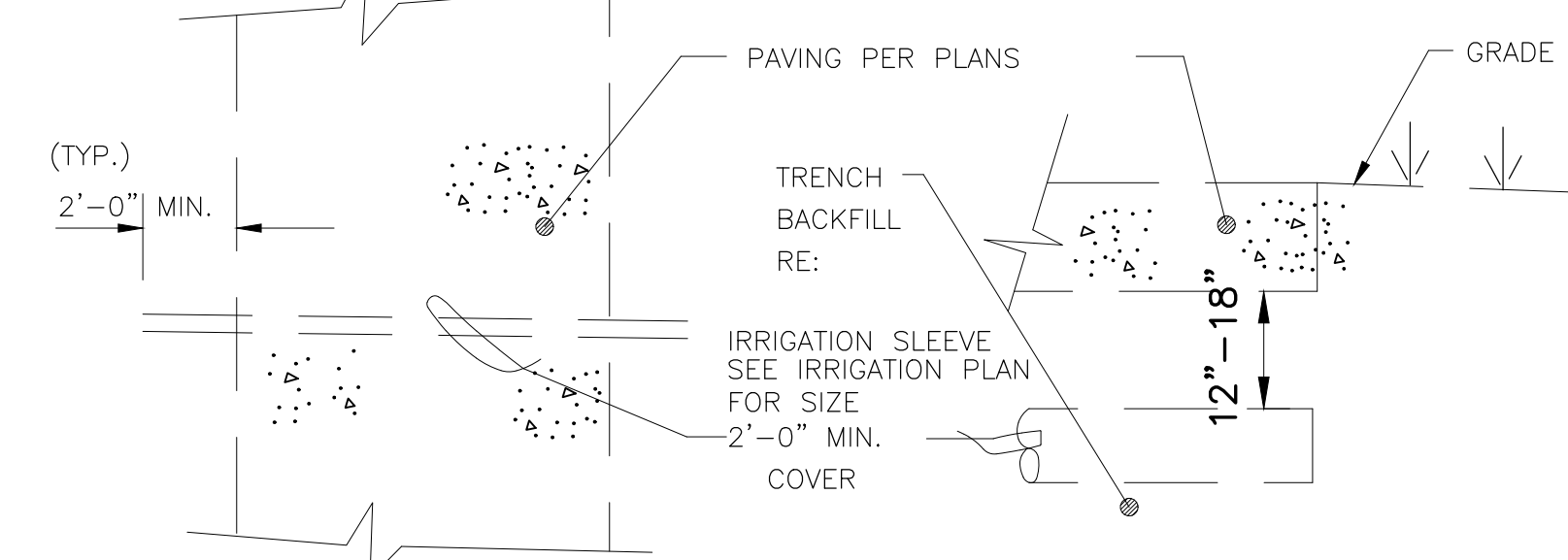
**2 CONCRETE PAVEMENT DETAIL**  
SCALE: NTS



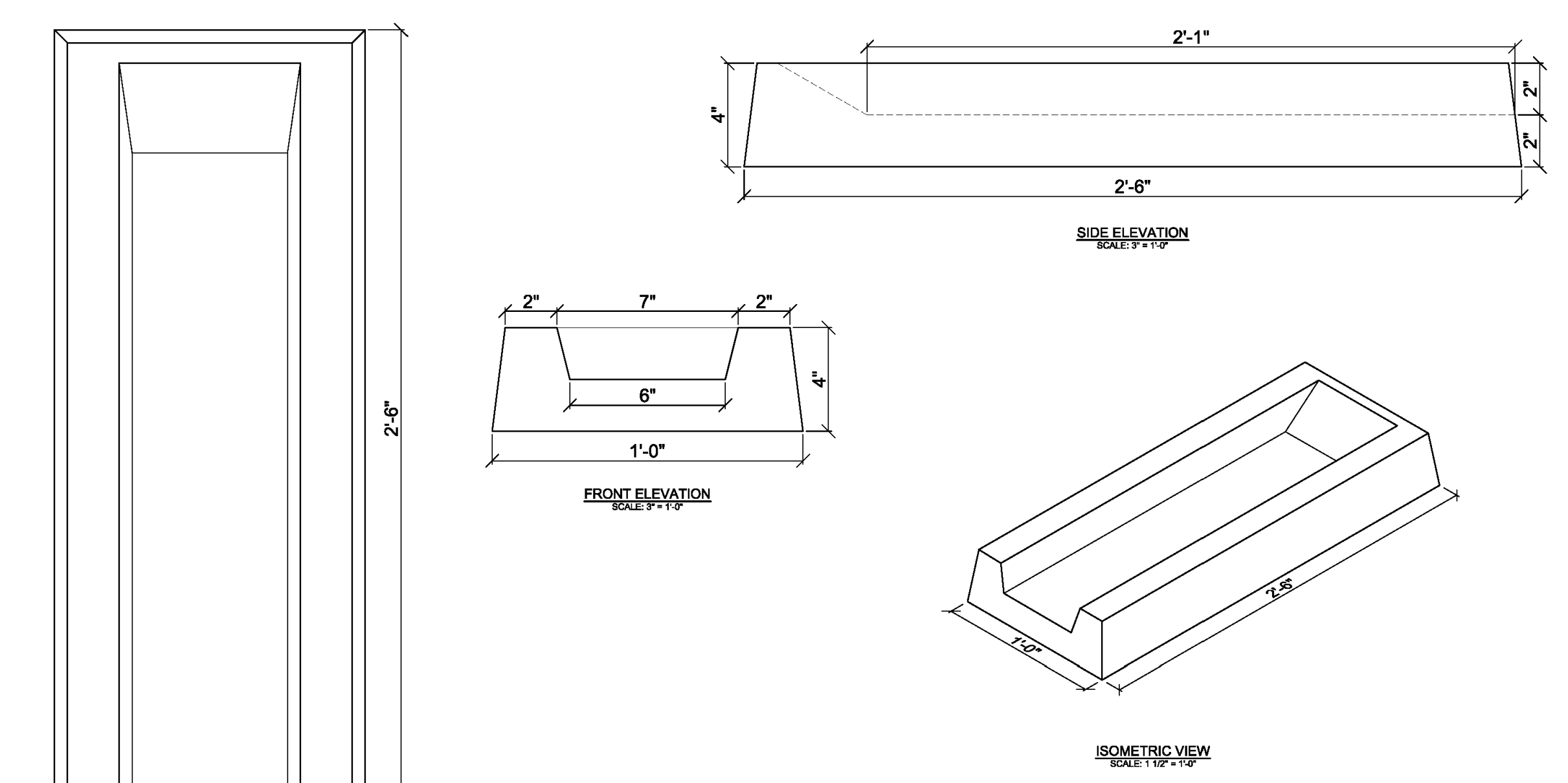
**NOTES:-**

- RAMP SHOULD BE LOCATED AS SHOWN ON CIVIL SITE SHEETS.
- DETECTABLE WARNING SURFACE, CONSISTING OF RAISED, TRUNCATED DOMES, SHALL BE INSTALLED ON THE RAMP ROWS OF TACTILE DOME TREATMENT SHOULD BE ORIENTATED PARALLEL WITH THE CENTER LINE OF RAMP. THE SAME DETECTABLE WARNING SURFACE PATTERN AND COLOR SHALL BE USED THROUGHOUT THE PROJECT. DETECTABLE WARNING SURFACES SHALL CONTRAST VISUALLY WITH ADJACENT WALKING SURFACES, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT.
- DETECTABLE WARNING SURFACES MUST BE FULLY ADA COMPLIANT.
- DETECTABLE WARNING SURFACE MUST MAINTAIN A SLIP RESISTANCE WITH A FA-VALUE EQUAL TO OR GREATER THAN 8.0 AND A WATER ABSORPTION RATE OF LESS THAN 1%. THE DETECTABLE WARNING SURFACE SHALL NOT ALLOW WATER TO ACCUMULATE.
- DETECTABLE WARNING INSTALLED INTO FRESH CONCRETE SHALL BE WITHOUT VOIDS AND UTILIZING AN ANCHORING SYSTEM APPROVED BY THE ENGINEER.
- DETECTABLE WARNING INSTALLED INTO FRESH CONCRETE SHALL BE WITHOUT VOIDS AND UTILIZING AN ANCHORING SYSTEM APPROVED BY THE ENGINEER.
- DETECTABLE WARNING SURFACE SHALL BE A MINIMUM OF 24" IN DEPTH IN THE DIRECTION OF PEDESTRIAN TRAVEL AND EXTEND FULL WIDTH OF THE RAMP. DETECTABLE WARNING SURFACES SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS 6" MIN TO 10" MAX FROM THE DETECTABLE WARNING SURFACE.
- TRUNCATED DOMES IN A DETECTABLE WARNING SURFACE SHALL HAVE A BASE DIAMETER OF 0.9 INCH MIN AND 1.4 INCHES MAX, A TOP DIAMETER OF 90 PERCENT OF THE BASE DIAMETER MIN TO 65 PERCENT OF THE BASE DIAMETER MAX, AND A HEIGHT OF 0.2 INCH. TRUNCATED DOMES SHALL HAVE A CENTER-TO-CENTER SPACING OF 1.6 INCHES MINIMUM AND 2.4 INCHES MAXIMUM, AND A BASE-TO-BASE SPACING OF 0.65 INCH MIN, MEASURED BETWEEN THE MOST ADJACENT DOMES ON A SQUARE GRID.

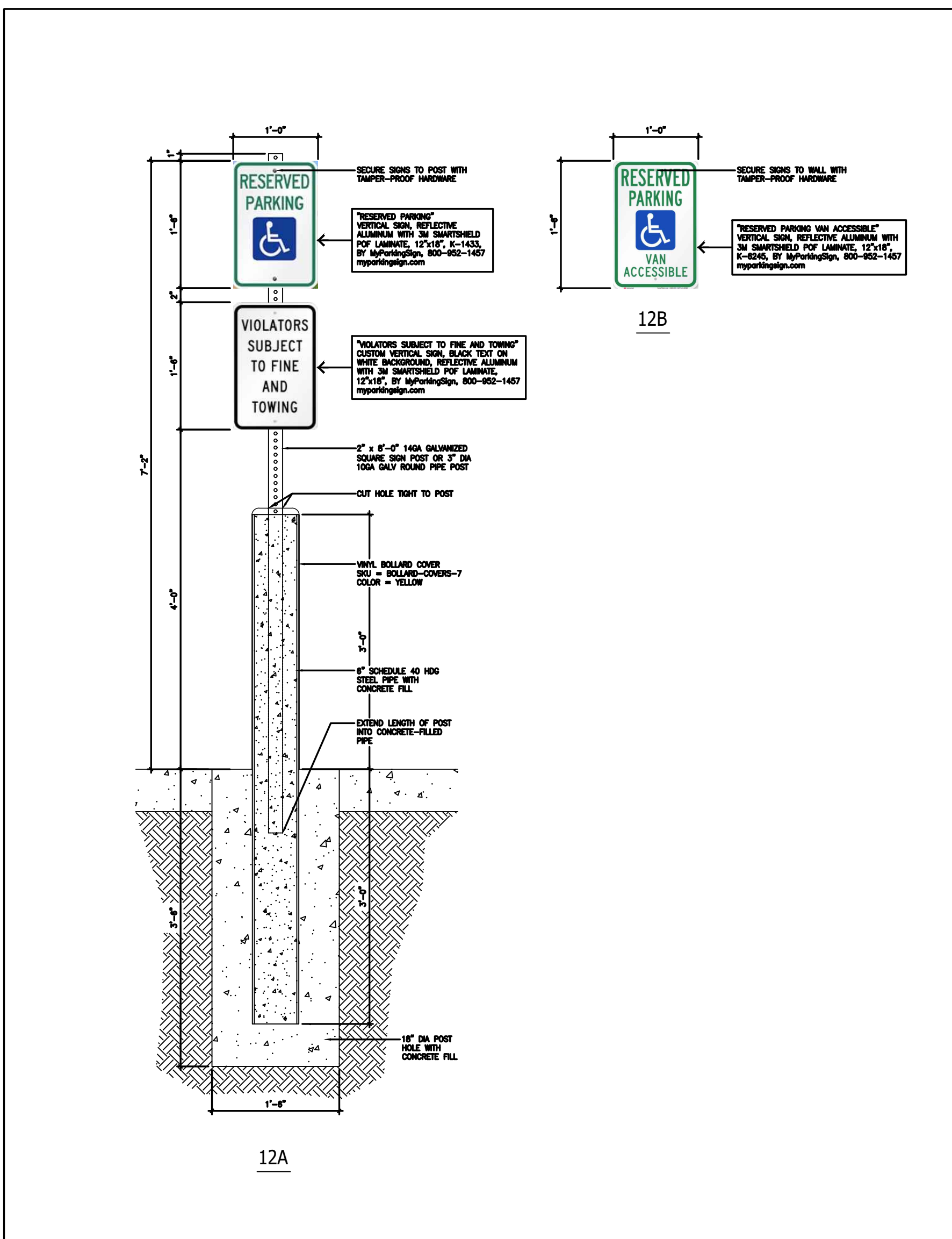
**5 ON SITE ADA RAMP DETAIL**  
SCALE: NTS



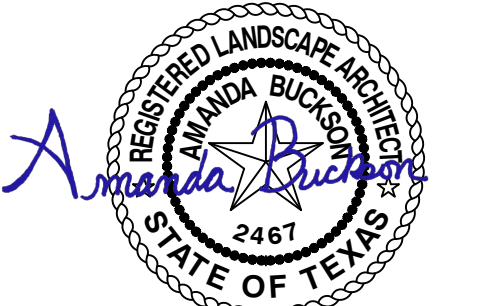
**8 IRRIGATION SLEEVE**  
NTS



**7 CONC. SPLASH BLOCK**  
NTS



**12 ACCESSIBILITY PARKING SIGN**  
SCALE: NTS



JANUARY 17, 2024

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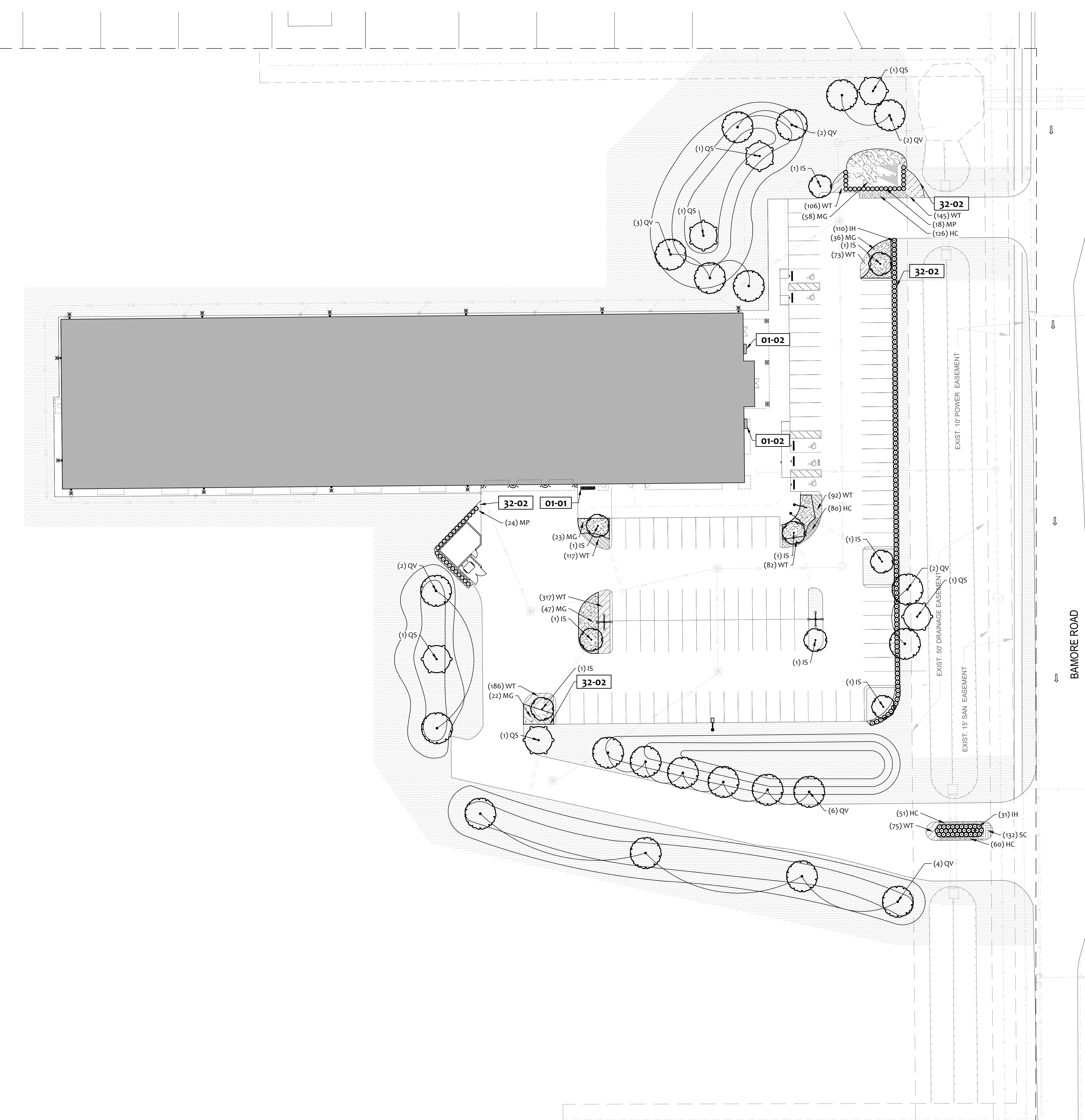
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FOR BID AND PERMIT



**PLANTING NOTES**

- ALL MATERIAL QUANTITIES ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. CONTRACTOR SHALL VERIFY ALL QUANTITIES.
- CONTRACTOR SHALL HAVE ALL UTILITY LINES LOCATED BEFORE PERFORMING ANY EXCAVATION FOR LANDSCAPE AND/OR IRRIGATION INSTALLATION. CONTRACTOR SHALL TAKE NECESSARY STEPS TO PROTECT EXISTING UTILITIES.
- PRIOR TO APPLYING SOD OR HYDROSEED, ALL STONES AND DEBRIS LARGER THAN 1 INCH IN ANY DIMENSION SHALL BE REMOVED AND SURFACE MUST BE TOP DRESSED WITH 2" OF TOPSOIL AND FINE GRADED SMOOTH.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING A FULL AND HEALTHY STAND OF GRASS AT THE TIME OF POSSESSION BY THE OWNER.
- ALL AREAS DISTURBED BY CONSTRUCTION (INCLUDING AREAS OUTSIDE PROPERTY LINES) SHALL BE PLANTED AND WATERED A MINIMUM OF 10 WEEKS OR UNTIL GRASS IS FULLY ESTABLISHED.
- LANDSCAPE BED EDGING SHALL BE PROVIDED WHERE INDICATED ON PLANS AND BETWEEN PLANTING/STONE BEDS AND LAWN AREAS/SIDEWALKS. SEE SHEET L3.1 FOR DETAILS.
- OPEN AREAS WITHIN LANDSCAPE BEDS SHALL BE MULCHED AS SHOWN IN DETAILS ON SHEET L3.1 AND AS SPECIFIED.
- CONTRACTOR IS RESPONSIBLE FOR OBTAINING PHOTOGRAPHS OF ACTUAL LANDSCAPE MATERIALS AND SUBMITTING THEM TO THE LANDSCAPE ARCHITECT OF RECORD FOR APPROVAL PRIOR TO INSTALLATION.
- PLANT MATERIAL SELECTED SHALL FOLLOW THE GUIDELINES OF THE AMERICAN STANDARD FOR NURSERY STOCK BY THE AMERICAN ASSOCIATION OF NURSERYMEN AND MEET OR EXCEED ALL SIZE REQUIREMENTS LISTED ON PLANT SCHEDULE.
- ALL PLANTINGS SHALL BE MAINTAINED IN A HEALTHY STATE BY LANDSCAPE CONTRACTOR AND SHALL BE WARRANTED (FOR REPLACEMENT) FOR ONE (1) CALENDAR YEAR AFTER ACCEPTANCE OF THE LANDSCAPE INSTALLATION.

**PLANT SCHEDULE**

SYMBOL	CODE	QTY	COMMON / BOTANICAL NAME	SIZE	CAL	HT	SPR	BR HT
<b>TREES</b>								
IS		9	Savannah Holly / Ilex x attenuata 'Savannah'	30 GAL	2.5"	8' MIN	4' MIN	4' MIN
QS		6	Shumard Red Oak / Quercus shumardii	45 GAL	2"Cal	10' MIN	4'-5'	4'-5'
QV		21	Southern Live Oak / Quercus virginiana	45 GAL	1.5"	10' MIN	3' MIN	3' MIN
<b>SHRUBS</b>								
IH		141	Snow White Indian Hawthorn / Rhaphiolepis indica 'Snow White'	3 GAL		18"	36"	
MP		42	Dwarf Southern Wax Myrtle / Myrica pusilla	3 GAL		24"	36"	
<b>SHRUB AREAS</b>								
MG		223	Gulf Coast Pink Muhly Grass / Muhlenbergia capillaris 'Gulf Coast'	1gal		24"	36"	
<b>GROUND COVERS</b>								
HC		307	Daylily / Hemerocallis x 'Happy Returns'	1 GAL		18"	12"	
SOD		84,000 sf	Bermuda Grass / Cynodon dactylon 'Tif 419'	SOD				
WT		1,255	Wedelia / Wedelia trilobata	1gal		6"	18"	

**REFERENCE NOTES SCHEDULE**

SYMBOL	DESCRIPTION	QTY
01-01	BIKE RACK	1
01-02	BENCH	2
<b>32 Exterior Improvements</b>		
32-02	BED EDGE	646 lf 5/L3.10

**CITY OF ROSENBERG, TX**

**LANDSCAPE ANALYSIS FORM**

**UNIFIED DEVELOPMENT CODE**

**SIGNAGE**  
Sec. 1-376. H.  
Provide a landscaped area twice the footprint of any community sign at its base.  
Screen the base of the community sign with a minimum of 1 foot tall evergreen shrubs.

**PARKING LOT**  
Sec. 1-417. A.  
Use a minimum of 10 percent of the parking lot area for landscaping.  
That 10 percent must be planned as island, perimeter landscaping, or any combination. 50 percent of that requirement must be islands.  
Sec. 1-417. B.  
50 percent of the minimum-required landscaped area is allowed for landscaping of the street right-of-way.

TYPE	Area (SF)	Multiplier	Required (SF)	Provided (SF)
10% PARKING LANDSCAPE	63,656	10%	6,366	9,060
50% IN ISLANDS	6,366	50%	3,183	5,358

Sec. 1-417. C.  
Screen off-street parking areas (including drives) that are next to residential areas by using six-foot wall or opaque fence. Label and show all planting for areas regulated by this article.  
Sec. 1-479. D.  
For every 20 parking spaces, provide a minimum landscape area of 180 square feet within the parking lot. Plant a minimum of 1 primary or secondary tree in each the required areas. Do not exceed 3 feet height of shrubs and plantings in the remainder of the required areas.

Formula	Required (SF)	Provided (SF)
(123 total parking spaces + 20 parking spaces) x 180 sf =	954	8,088

**STREET TREES AND SHRUBS**  
Sec. 1-479. B.  
Plant a minimum of one thirty-gallon, 1-1/2 inch caliper, 6' height primary tree for every 45 feet of street frontage. In cases of overhead utilities, use secondary trees.

STREET NAME	Lineal Feet	Tree Planting Requirement	Equivalent Credits	Trees Provided
BAMORE RD	690 + 45	16	0	16
<b>TOTAL STREET TREES</b>				<b>16</b>

Sec. 1-479. C.  
Plant a single row of minimum 3-gallon or larger shrubs on 3-foot spacing along the fronts of parking lots in parking setback areas along public streets. 2-foot height requirement at the time of planting.

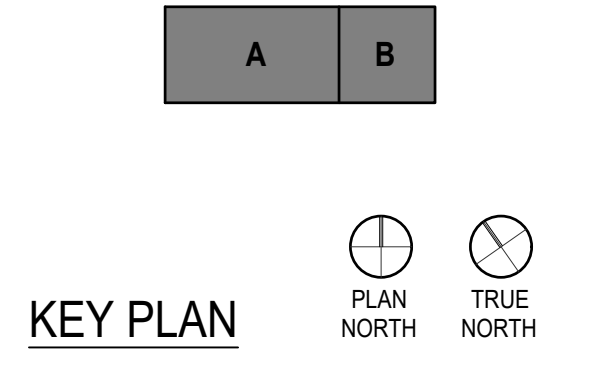
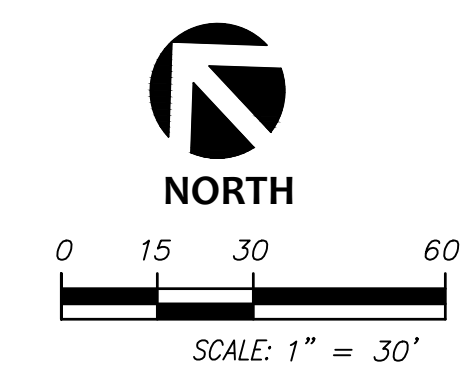
STREET NAME	Lineal Feet	Planting Requirement	Equivalent Credits	Planting Provided
BAMORE RD	285 + 3'	95	0	110
<b>TOTAL STREET PARKING SHRUBS</b>				<b>110</b>

Sec. 1-479. F.  
Provide a landscaped area at the front entrance of buildings.

Definitions:

CLASS	Name of Tree
PRIMARY TREE	Live oak, shumard oak, red maple, Mexican sycamore, bald cypress, loblolly pine, or southern red oak
SECONDARY TREE	River birch, wax myrtle, eastern redbud, grape myrtle, Mexican plum, cherry laurel, or east Palatka holly

**MUNICOD**  
Ch. 24, Article VI, Sec. 24-177. A.  
Use approved plantings and layout requirements for landscaping of the street right-of-way.  
Ch. 24, Article VI, Sec. 24-177. C.1.  
Large trees shall not be planted within 16 feet of overhead utilities.  
Ch. 24, Article VI, Sec. 24-177. C.3.  
No tree shall be planted within thirty (30) feet of a traffic signal, stop sign, street light or other regulatory traffic sign.



Project No.: 2023

Drawing Date: 01.17.2024  
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Scale: AS NOTED

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Planting Plan 1

**L1.10**

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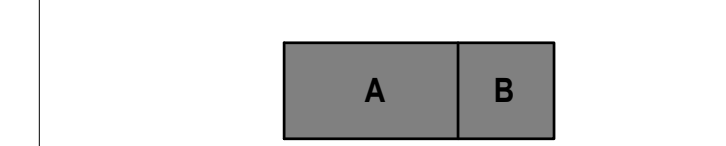
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**KEY PLAN**  
PLAN NORTH  
TRUE NORTH

**Project No.: 2023**

Drawing Date: 01.17.2024  
Drawn: MSB  
Checked: ADB  
Scale: AS NOTED

**Issue Log:**

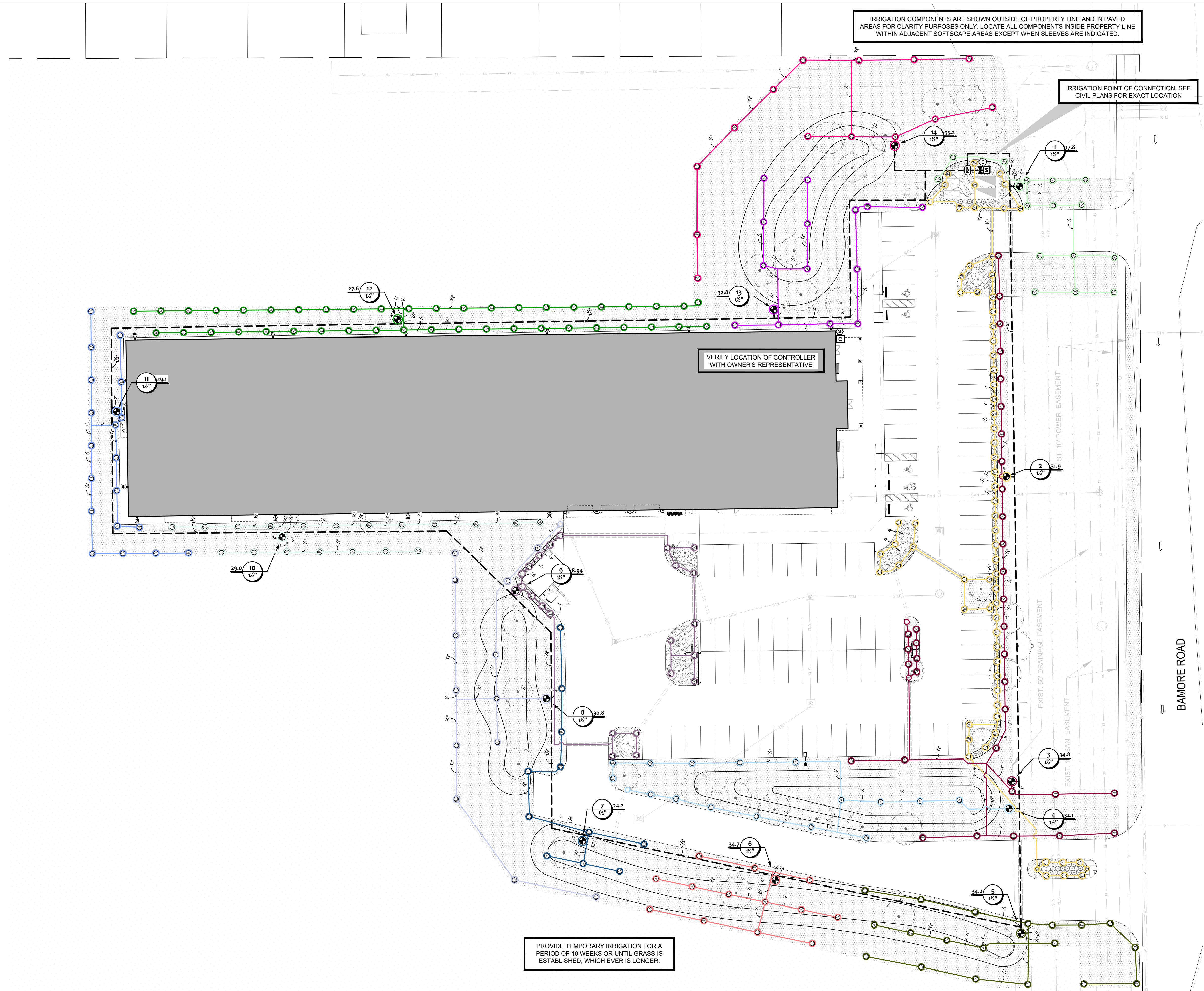
No.	Description	Date

**Revisions:**

No.	Description	Date

**Irrigation Plan 1**

**L2.10**



SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI	DETAIL
○	Hunter MP Corner PROS-04-PRS30-CV Turf Rotator, 4in. pop-up with factory installed check valve, pressure regulated to 30 psi, MP Rotator nozzle. T=Turquoise adj arc 45-105 on PRS30 body.	4	30	
△	Hunter MP Corner PROS-06-PRS30-CV-F (2) Turf Rotator, 6in. pop-up with factory installed check valve, fluguard, pressure regulated to 30 psi, MP Rotator nozzle on PRS30 body. T=Turquoise adj arc 45-105.	10	30	
△△△	Hunter MP Strip PROS-06-PRS30-CV-F (2) Turf Rotator, 6in. pop-up with factory installed check valve, fluguard, pressure regulated to 30 psi, MP Rotator nozzle on PRS30 body. LST=Ivory left strip, SST=Brown side strip, RST=Copper right strip.	45	30	
○	Hunter MP1000 PROS-04-PRS30-CV Turf Rotator, 4in. pop-up with check valve, pressure regulated to 30 psi, MP Rotator nozzle on PRS30 body. M=Maroon adj arc 90 to 210, L=Light Blue 210 to 270 arc, O=Olive 360 arc.	10	30	
△△△	Hunter MP2000 PROS-06-PRS30-CV-F (2) Turf Rotator, 6in. pop-up with check valve, fluguard, pressure regulated to 30 psi, MP Rotator nozzle on PRS30 body. M=Maroon adj arc 90 to 210, L=Light Blue 210 to 270 arc, O=Olive 360 arc.	5	30	
○	Hunter MP2000 PROS-04-PRS30-CV Turf Rotator, 4in. pop-up with factory installed check valve, pressure regulated to 30 psi, MP Rotator nozzle on PRS30 body. K=Black adj arc 90-210, G=Green adj arc 210-270, R=Red 360 arc.	73	30	
△△△	Hunter MP2000 PROS-06-PRS30-CV-F (2) Turf Rotator, 6in. pop-up with factory installed check valve, fluguard, pressure regulated to 30 psi, MP Rotator nozzle on PRS30 body. K=Black adj arc 90-210, G=Green adj arc 210-270, R=Red 360 arc.	24	30	
○	Hunter MP3000 PROS-04-PRS30-CV Turf Rotator, 4in. pop-up with factory installed check valve, pressure regulated to 30 psi, MP Rotator nozzle on PRS30 body. B=Blue adj arc 90-210, Y=Yellow adj arc 210-270, A=Gray 360 arc.	92	30	
△△△	Hunter MP3000 PROS-06-PRS30-CV-F (2) Turf Rotator, 6in. pop-up with factory installed check valve, fluguard, pressure regulated to 30 psi, MP Rotator nozzle on PRS30 body. B=Blue adj arc 90-210, Y=Yellow adj arc 210-270, A=Gray 360 arc.	6	30	
○	Hunter MP3500 PROS-04-PRS30-CV Turf Rotator, 4in. Pop-up with factory installed check valve, pressure regulated to 30 psi, MP Rotator nozzle on PRS30 body. LB=light brown adjustable arc, 90-210.	57	30	
△△△	Hunter MP800SR PROS-06-PRS30-CV-F (2) Turf Rotator, 6in. pop-up with check valve, fluguard, pressure regulated to 30 psi, MP Rotator nozzle on PRS30 body. ADJ=Orange and Gray ( arc 90-210), 360=Lime Green and Gray (arc 360)	2	30	
○	Hunter ICV-G 1in., 1 1/2in., 2in., and 3in. Plastic Electric Remote Control Valves, Globe Configuration, with NPT Threaded Inlet/Outlet, for Commercial/Municipal Use.	14		
✕	Shut Off Valve Isolation Gate Valve Febco 765 1-1/2"	1		
BF	Pressure Vacuum Breaker, brass with ball valve SOV. Install 12in. above highest downstream outlet and the highest point in the downstream piping.	1		
C	Hunter P2C-400 w/ (01) PCM-300 & (01) PCM-900 Light Commercial & Residential Controller, 16-station expanded module controller, 120 VAC, Outdoor/Indoor model	1		
S	Hunter WR-CLIK Rain Sensor, install within 1000 ft of controller, in line of sight. 22-28 VAC/VDC 100 mA power from timer transformer. Mount as noted.	1		
E	Strong Box SBBC-22CR Low profile, tube and wire construction smooth touch surface, cold rolled steel, backflow enclosure. 23.5in.L, 28in.H, 17.75in.W.	1		
---	Irrigation Lateral Line: PVC Class 200 SDR 21	6,765 l.f.		
---	Irrigation Mainline: PVC Schedule 40	2,074 l.f.		
---	Pipe Sleeve: PVC Schedule 80	293.4 l.f.		



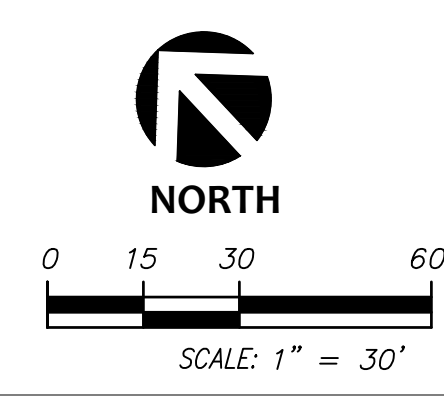
NUMBER	MODEL	SIZE	TYPE	GPM	WIRE	PSI	PSI @ POC	PRECIP
1	Hunter ICV-G	1-1/2"	Turf Rotary	17.84	288.0	35.9		0.25 in/h
2	Hunter ICV-G	1-1/2"	Turf Rotary	31.93	466.5	37.5		0.68 in/h
3	Hunter ICV-G	1-1/2"	Turf Rotary	34.82	653.7	37.5		0.24 in/h
4	Hunter ICV-G	1-1/2"	Turf Rotary	32.08	672.6	37.4		0.34 in/h
5	Hunter ICV-G	1-1/2"	Turf Rotary	34.23	743.4	35.5		0.42 in/h
6	Hunter ICV-G	1-1/2"	Turf Rotary	34.69	896.8	34.7		0.47 in/h
7	Hunter ICV-G	1-1/2"	Turf Rotary	24.17	1,019	36.8		0.26 in/h
8	Hunter ICV-G	1-1/2"	Turf Rotary	30.79	938.8	37.0		0.24 in/h
9	Hunter ICV-G	1-1/2"	Turf Rotary	8.94	864.4	37.3		0.56 in/h
10	Hunter ICV-G	1-1/2"	Turf Rotary	28.96	706.0	36.7		0.52 in/h
11	Hunter ICV-G	1-1/2"	Turf Rotary	29.09	524.5	37.3		0.59 in/h
12	Hunter ICV-G	1-1/2"	Turf Rotary	27.57	297.6	37.3		0.4 in/h
13	Hunter ICV-G	1-1/2"	Turf Rotary	32.8	67.4	36.5		0.28 in/h
14	Hunter ICV-G	1-1/2"	Turf Rotary	33.24	233.7	37.4		0.21 in/h
	Common Wire				2,074			

NUMBER	MODEL	TYPE	PRECIP	IN./WEEK	MIN./WEEK	GAL./WEEK	GAL./DAY
1	Hunter ICV-G	Turf Rotary	0.25 in/h	1	236	4,210	601
2	Hunter ICV-G	Turf Rotary	0.68 in/h	1	88	2,810	401
3	Hunter ICV-G	Turf Rotary	0.24 in/h	1	250	8,705	1,244
4	Hunter ICV-G	Turf Rotary	0.34 in/h	1	178	5,710	816
5	Hunter ICV-G	Turf Rotary	0.42 in/h	1	145	4,963	709
6	Hunter ICV-G	Turf Rotary	0.47 in/h	1	128	4,441	634
7	Hunter ICV-G	Turf Rotary	0.26 in/h	1	234	5,656	808
8	Hunter ICV-G	Turf Rotary	0.24 in/h	1	249	7,666	1,095
9	Hunter ICV-G	Turf Rotary	0.56 in/h	1	108	965	138
10	Hunter ICV-G	Turf Rotary	0.52 in/h	1	115	3,331	476
11	Hunter ICV-G	Turf Rotary	0.59 in/h	1	102	2,968	424
12	Hunter ICV-G	Turf Rotary	0.4 in/h	1	150	4,135	591
13	Hunter ICV-G	Turf Rotary	0.28 in/h	1	215	7,052	1,007
14	Hunter ICV-G	Turf Rotary	0.21 in/h	1	280	9,308	1,330
	TOTALS:				2,478	71,919	10,274

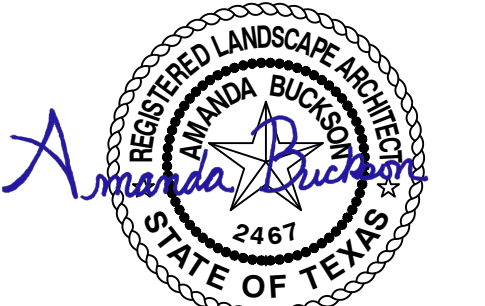
NOTE: CONTRACTOR SHALL LAMINATE A COPY OF THE ABOVE SCHEDULE AND AFFIX IT TO THE INSIDE COVER OF THE IRRIGATION CONTROLLER.

**IRRIGATION NOTES:**

- IRRIGATION HAS BEEN DESIGNED WITH AN ASSUMED PRESSURE OF 60 PSI AT THE IRRIGATION METER. IF AVAILABLE PRESSURE IS LESS THAN ASSUMED NOTIFY LICENSED IRRIGATOR OF RECORD PRIOR TO SYSTEM INSTALLATION FOR DESIGN MODIFICATION INSTRUCTIONS.
- INSTALL WEATHER SENSING DEVICE AS SPECIFIED. AFFIX TO INSIDE OF PARAPET WALL ABOVE CONTROLLER. COORDINATE EXACT LOCATION WITH OWNER AND ARCHITECT AND CONDUIT FOR WIRING WITH ELECTRICAL CONSULTANT.
- A LICENSED IRRIGATOR MUST BE ON-SITE AND PROVIDE SUPERVISION FOR THE ENTIRE DURATION OF THE IRRIGATION SYSTEM INSTALLATION. PER TAG RULE 344.36. ON-SITE SUPERVISING LICENSED IRRIGATOR ASSUMES ALL RESPONSIBILITY FOR THE IRRIGATION SERVICES PERFORMED IN ACCORDANCE WITH THESE DOCUMENTS.
- BACKFLOW PREVENTER MUST BE WINTERIZED UPON INSTALLATION.
- EACH IRRIGATION CONTROL VALVE SHALL BE ADJUSTED TO PROVIDE THE MINIMUM AMOUNT OF PRESSURE REQUIRED (PER MANUFACTURER'S RECOMMENDATIONS) TO OPERATE THE IRRIGATION ZONE IT IS SERVING.
- ALL IRRIGATION PIPING AND VALVES MUST MEET THE SEPARATION DISTANCES FROM THE ON-SITE SEWAGE FACILITIES SYSTEM AS REQUIRED FROM A PRIVATE WATER LINE IN 289.91(10) OF TAG TITLE 30 RELATING TO MINIMUM REQUIRED SEPARATION DISTANCES FROM ON-SITE SEWAGE FACILITIES.
- ALL IRRIGATION EMISSION DEVICES MUST DIRECT FLOW AWAY FROM ANY ADJACENT IMPERVIOUS SURFACE AND SHALL NOT BE INSTALLED CLOSER THAN FOUR INCHES FROM A HARDSCAPE AREA, SUCH AS, BUT NOT LIMITED TO, A BUILDING, FENCE, CONCRETE, OR ANY OTHER IMPERVIOUS MATERIAL.
- IRRIGATION EMISSION DEVICES MUST BE INSTALLED TO OPERATE AT THE MINIMUM AND NOT ABOVE THE MAXIMUM SPRINKLER HEAD PRESSURE AS PUBLISHED BY THE MANUFACTURER FOR THE NOZZLE AND HEAD SPACING THAT IS USED.
- ALL PVC IRRIGATION PIPING MUST NOT EXCEED THE MAXIMUM WATER VELOCITY WITHIN FIVE FEET PER SECOND.
- ALL UNLABELED PVC IRRIGATION PIPING THAT IS DOWN STREAM OF PIPE SIZES LABELED 3/4" SHALL BE 1/2" CLASS 315 PVC.
- ALL PVC FITTINGS MUST BE PRIMED WITH A COLORED PRIMER PRIOR TO APPLYING THE PVC CEMENT IN ACCORDANCE WITH THE UNIFORM PLUMBING CODE (SECTION 316) OF THE INTERNATIONAL PLUMBING CODE (SECTION 605)
- RAIN/MOISTURE SHUT-OFF TECHNOLOGY MUST BE INSTALLED AND DONE SO IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED RECOMMENDATIONS.
- AN ISOLATION VALVE MUST BE INCLUDED ON ALL IRRIGATION INSTALLATIONS AND SHALL BE PLACED BETWEEN THE WATER METER AND THE BACKFLOW PREVENTION DEVICE.
- ALL IRRIGATION PIPING MUST HAVE A MINIMUM DEPTH COVERAGE PER MANUFACTURER'S RECOMMENDATION, OR THAT OF SIX (6) INCHES (WHICHEVER IS GREATER) OF SELECT BACKFILL BETWEEN THE TOP OF THE PIPE AND THE FINISHED GRADE OF THE TOPSOIL. MOUNDING SOIL TO MEET THIS REQUIREMENT MUST BE NOTED ON THE IRRIGATION PLAN AND DISCUSSED WITH THE IRRIGATION SYSTEM OWNER OR OWNER'S REPRESENTATIVE AND LICENSED IRRIGATOR OF RECORD TO ADDRESS ANY SAFETY ISSUES.
- ALL TRENCHES AND HOLES CREATED DURING INSTALLATION OF AN IRRIGATION SYSTEM MUST BE BACKFILLED AND COMPACTED TO FINISHED GRADE.
- ALL UNDERGROUND WIRING MUST BE LISTED BY UNDERWRITERS LABORATORIES AS ACCEPTABLE FOR BURIAL AND MUST BE BURIED WITH A MINIMUM OF SIX (6) INCHES OF BACKFILL.
- ALL ELECTRICAL WIRE SPLICES EXPOSED TO MOISTURE MUST BE WATERPROOFED WITH RAINBIRD DB SERIES WIRE CONNECTORS OR APPROVED EQUAL.
- ALL QUICK COUPLERS MUST BE INSTALLED USING A QUICK COUPLER KEY AND PLACED IN A VALVE BOX. AN ISOLATION VALVE MUST BE INSTALLED UPSTREAM OF EACH QUICK COUPLER.
- A FINAL WALK THROUGH WITH OWNER'S REPRESENTATIVE MUST BE SCHEDULED PRIOR TO FINAL COMPLETION, TO EXPLAIN OPERATION OF THE SYSTEM.
- UPON COMPLETION OF THE IRRIGATION SYSTEM INSTALLATION, PROVIDE THE OWNER OR OWNER'S REPRESENTATIVE WITH A DOCUMENT CONTAINING, BUT NOT LIMITED TO THE FOLLOWING INFORMATION:
  - DRAWING SHOWING ACTUAL INSTALLATION ALL VARIANCES FROM ORIGINAL PLAN MUST BE AUTHORIZED BY LICENSED IRRIGATOR OF RECORD. DRAWING MUST INCLUDE THE STATEMENT "THIS IRRIGATION SYSTEM HAS BEEN INSTALLED IN ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL LAWS, ORDINANCES, RULES, REGULATIONS OR ORDERS. I HAVE TESTED THE SYSTEM AND DETERMINED THAT IT HAS BEEN INSTALLED ACCORDING TO THE IRRIGATION PLAN AND IS PROPERLY ADJUSTED FOR THE MOST EFFICIENT APPLICATION OF WATER AT THIS TIME."
  - HOW TO OPERATE AND REPAIR THE IRRIGATION SYSTEM
- MANUFACTURER'S MANUAL FOR THE AUTOMATIC CONTROLLER
- HOW TO CHECK THE RAIN/MOISTURE SENSOR
- A LIST OF COMPONENTS THAT REQUIRE MAINTENANCE, SUCH AS FILTERS, AND THE RECOMMENDED FREQUENCY FOR THE SERVICE.
- HOW TO PRUNE GRASS AND PLANTS AWAY FROM IRRIGATION EMITTERS
- LIST OF PRECIPITATION RATES OF EACH IRRIGATION ZONE WITHIN THE SYSTEM
- DOCUMENTATION OUTLINING ANY WATER CONSERVATION MEASURES CURRENTLY IN EFFECT FROM THE WATER PURVEYOR
- THE NAME OF THE WATER PURVEYOR
- A SUGGESTED SEASONAL OR MONTHLY WATERING SCHEDULE BASED ON CURRENT EVAPOTRANSPIRATION DATA FOR THE GEOGRAPHIC REGION AND MINIMUM WATER REQUIREMENTS FOR THE PLANT MATERIAL IN EACH ZONE BASED ON THE SOIL TYPE AND PLANT MATERIAL WHERE THE SYSTEM IS INSTALLED.
- A WRITTEN WARRANTY COVERING MATERIALS AND LABOR FURNISHED IN THE NEW INSTALLATION OF THE IRRIGATION SYSTEM FOR A MINIMUM PERIOD OF ONE YEAR. WARRANTY MUST INCLUDE THE ON-SITE LICENSED IRRIGATION CONTRACTOR'S SEAL, NAME, SIGNATURE, DATE, BUSINESS ADDRESS AND BUSINESS TELEPHONE NUMBER(S). WARRANTY MUST INCLUDE THE STATEMENT, "IRRIGATION IN TEXAS IS REGULATED BY THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ), MC-178, P.O. BOX 130897, AUSTIN, TEXAS 78711-3087. TCEQ'S WEBSITE IS: WWW.TCEQ.STATE.TX.US. IRRIGATION CONTRACTOR SHALL ALSO SUPPLY INFORMATION REGARDING APPLICABLE MANUFACTURER'S WARRANTIES.
- AFFIX A PERMANENT STICKER TO THE IRRIGATION CONTROLLER THAT LISTS THE ON-SITE LICENSED IRRIGATOR'S NAME, LICENSE NUMBER, COMPANY NAME, TELEPHONE NUMBER(S) AND THE DATES OF THE WARRANTY PERIOD.
- AFFIX A LAMINATED AS-BUILT IRRIGATION ZONE MAP TO THE INSIDE COVER OF THE CONTROLLER. NUMBER ALL ZONES ON THE MAP. PROVIDE A CHART SHOWING THE PROGRAM, WATERING DAYS, START TIMES, AND RUN TIMES FOR EACH ZONE.
- REFER TO IRRIGATION SPECIFICATIONS FOR MORE INFORMATION.
- WHEN INSTALLING IRRIGATION UNDER OR NEAR EXISTING TREES, ALL TRENCHES MUST BEHIND DUG. ROOTS LARGER THAN THREE (3) INCHES IN DIAMETER MAY NOT BE CUT.



This document is for interim review only



JANUARY 17, 2024

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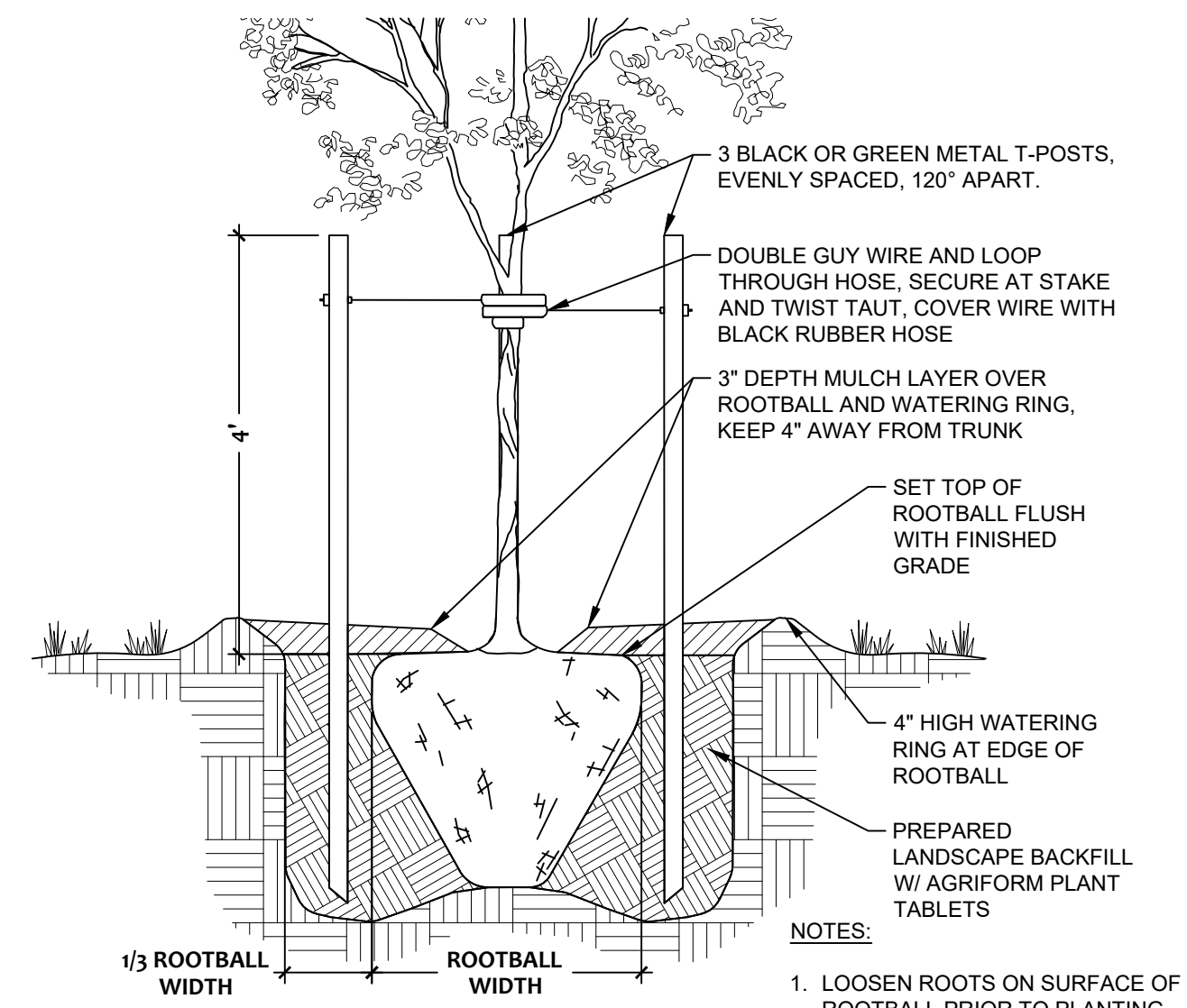
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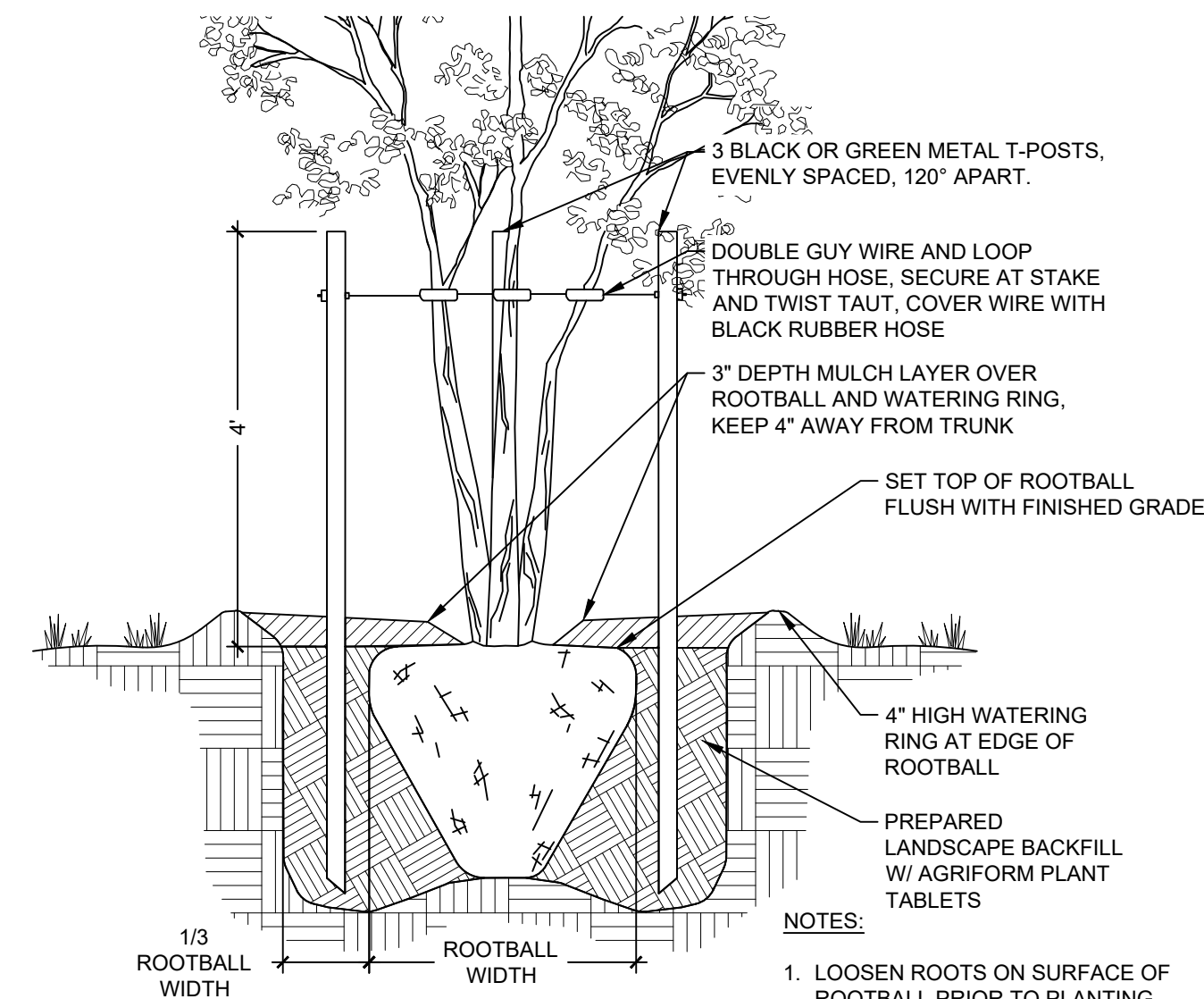
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tel. 361.299.1801  
rwheaton@wheaton-ees.com

**FBC Elections Administration Building**

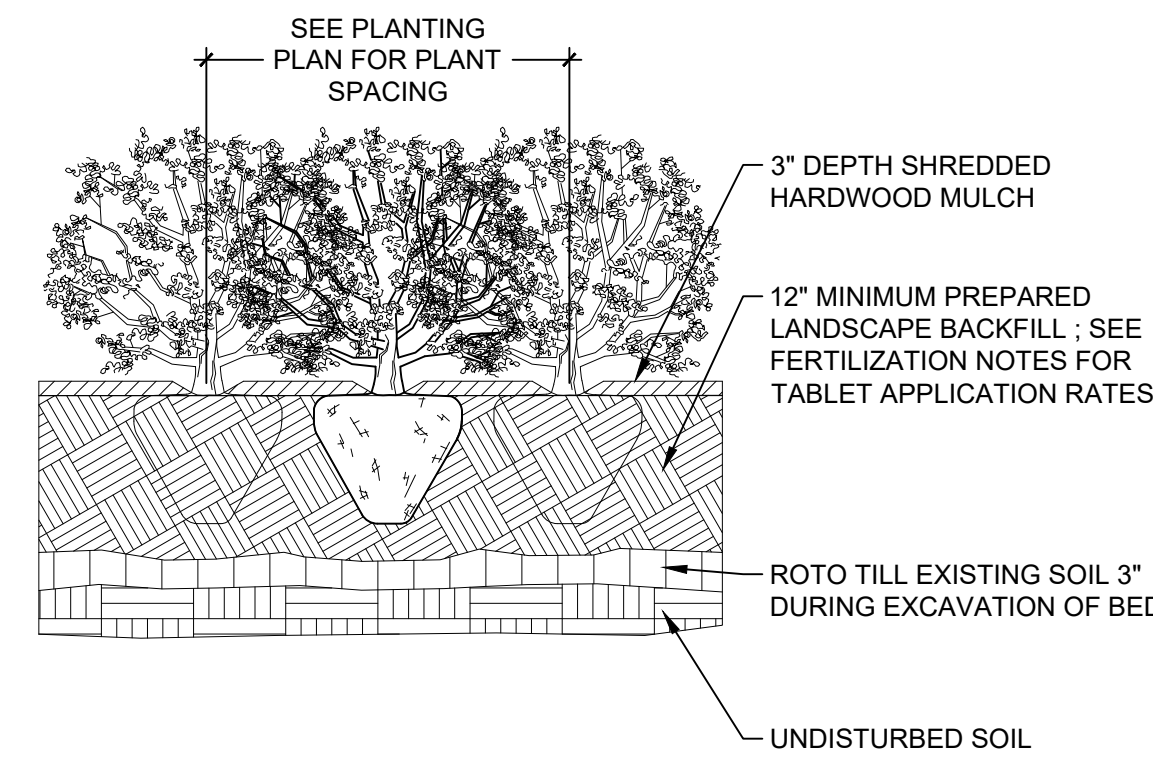
3700 DANFLORE ROAD  
ROSENBERG, TX 77471  
FOR BID AND PERMIT



**1 SINGLE-TRUNK TREE PLANTING**  
NTS 00-01

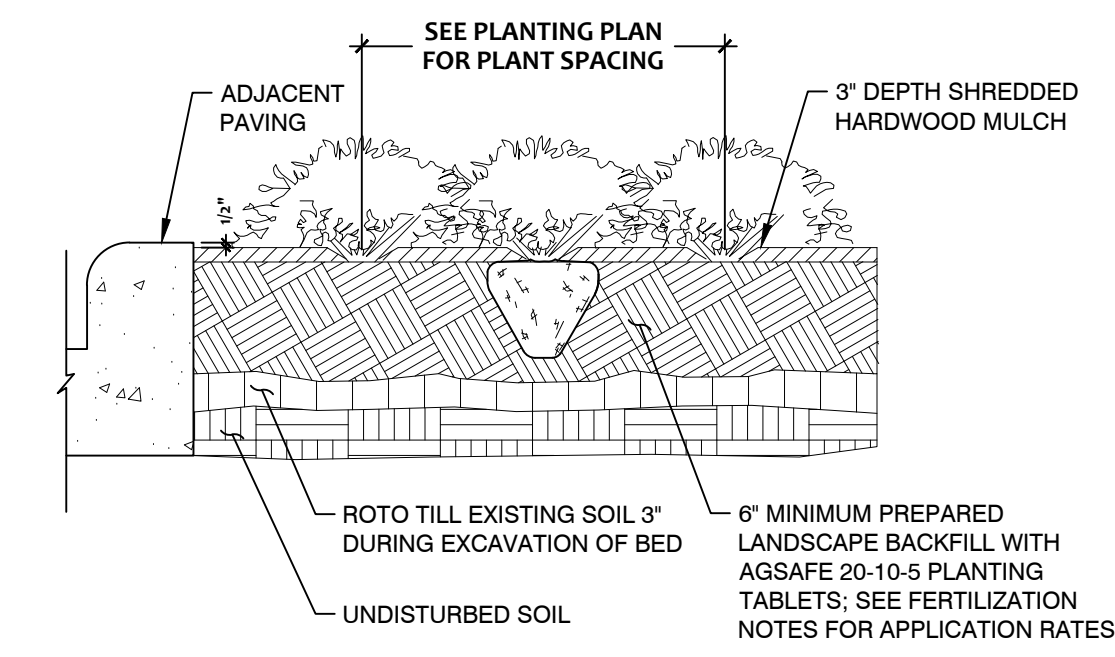


**2 MULTI TRUNK PLANTING**  
NTS 00-03



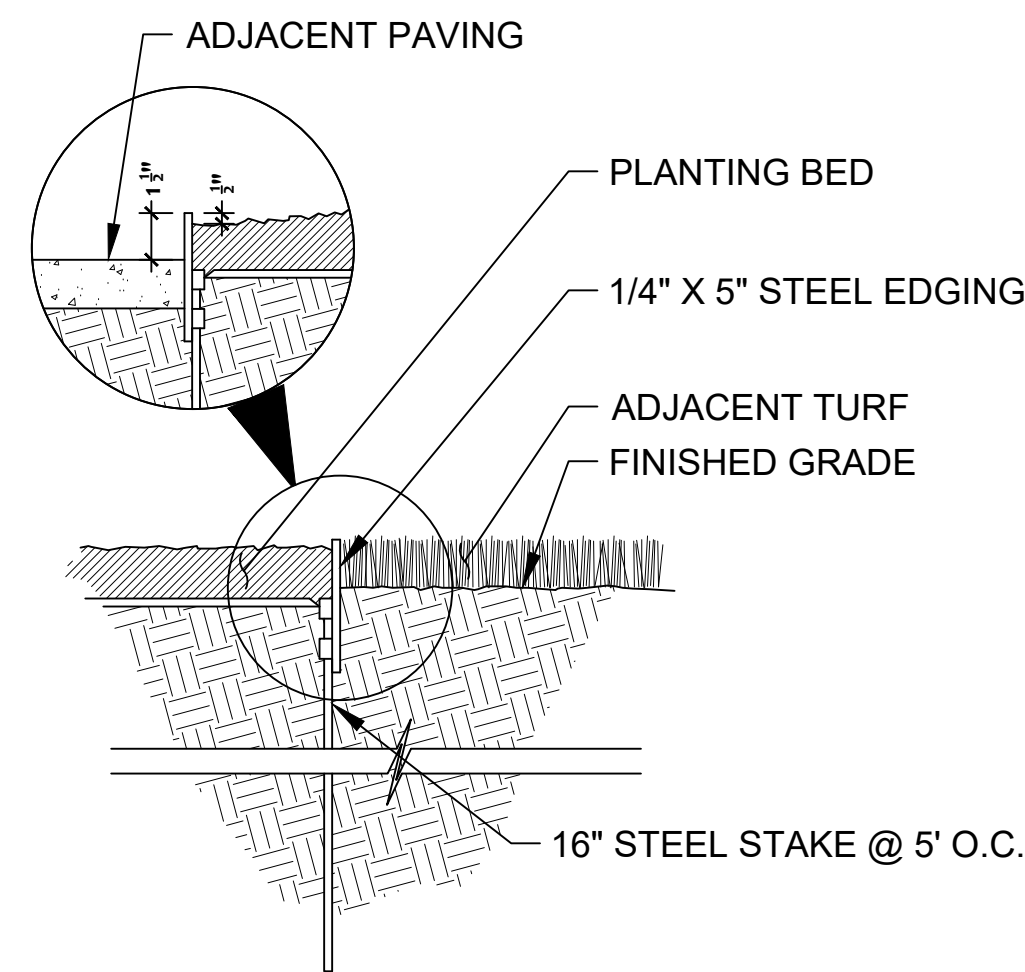
**NOTES:**  
1. PLANT SHRUBS ON TRIANGULAR SPACING WHEN NOT A PART OF A SINGLE ROW.  
2. LOOSEN ROOTS ON SURFACE OF ROOTBALL PRIOR TO PLANTING.

**3 SHRUB BED PLANTING**  
NTS 00-04



**NOTES:**  
1. PLACE PLANTS ON TRIANGULAR SPACING WHEN NOT A PART OF A SINGLE ROW.  
2. LOOSEN ROOTS ON SURFACE OF ROOTBALL PRIOR TO PLANTING.  
3. GROUNDCOVER AREAS SHALL RECEIVE FERTILIZATION WITH MIRACLE-GRO LIQUID QUICK START PLANT FOOD OR APPROVED EQUAL.

**4 GROUNDCOVER PLANTING**  
1/2\" = 1'-0\" 00-17



**5 BED EDGE - METAL**  
NTS 00-07

**PLANTING NOTES**

**SHRUBS AND TREES**

ALL TREES AND SHRUBS SHALL BE FERTILIZED WITH "AGRIFORM" 20-15-5 PLANTING TABLETS AT TIME OF INSTALLATION AND PRIOR TO COMPLETION OF PIT BACKFILLING. TABLETS SHALL BE PLACED UNIFORMLY AROUND THE ROOT MASS AT A DEPTH THAT IS BETWEEN THE MIDDLE AND BOTTOM OF THE ROOT MASS.

**APPLICATION RATE:**

- 1 GALLON CONTAINER: 1 - 21 GRAM TABLET
- 3 GALLON CONTAINER: 2 - 21 GRAM TABLETS
- 5 GALLON CONTAINER: 3 - 21 GRAM TABLETS
- 7 GALLON CONTAINER: 4 - 21 GRAM TABLETS

TREES: 3 - 21 GRAM TABLETS EACH 1/2" OF CALIPER PALMS: 7 - 21 GRAM TABLETS

**GROUNDCOVER AREAS**

ALL GROUNDCOVER AREAS SHALL RECEIVE FERTILIZATION WITH "MIRACLE-GRO LIQUID QUICK START PLANT FOOD." APPLY PER MANUFACTURER'S SPECIFICATIONS.

APPLY PRE-EMERGENT TO ALL BED AREAS.

**SOIL NOTES**

1. PREPARED LANDSCAPE BACKFILL SHALL HAVE A MINIMUM DEPTH AS SPECIFIED IN EACH DETAIL. PLANT MIX SHALL CONSIST OF THE FOLLOWING:
  - 1/3 COMPOST
  - 1/3 TOPSOIL
  - 1/3 ANGULAR SAND
2. SODHYDROMULCH AREAS SHALL RECEIVE 2 INCH MINIMUM TOPSOIL.

**PLANTING NOTES**

1. ALL MATERIAL QUANTITIES ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. CONTRACTOR SHALL VERIFY ALL QUANTITIES.
2. CONTRACTOR SHALL HAVE ALL UTILITY LINES LOCATED BEFORE PERFORMING ANY EXCAVATION FOR LANDSCAPE AND/OR IRRIGATION INSTALLATION. CONTRACTOR SHALL TAKE NECESSARY STEPS TO PROTECT EXISTING UTILITIES.
3. PRIOR TO APPLYING SOD OR HYDROSEED, ALL STONES AND DEBRIS LARGER THAN 1 INCH IN ANY DIMENSION SHALL BE REMOVED AND SURFACE MUST BE TOP DRESSED WITH 2" OF TOPSOIL AND FINE GRADED SMOOTH.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING A FULL AND HEALTHY STAND OF GRASS AT THE TIME OF POSSESSION BY THE OWNER.
5. ALL AREAS DISTURBED BY CONSTRUCTION (INCLUDING AREAS OUTSIDE PROPERTY LINES) SHALL BE PLANTED AND WATERED A MINIMUM OF 10 WEEKS OR UNTIL GRASS IS FULLY ESTABLISHED.
6. LANDSCAPE BED EDGING SHALL BE PROVIDED WHERE INDICATED ON PLANS AND BETWEEN PLANTING/STONE BEDS AND LAWN AREAS/SIDEWALKS. SEE SHEET L3.1 FOR DETAILS.
7. OPEN AREAS WITHIN LANDSCAPE BEDS SHALL BE MULCHED AS SHOWN IN DETAILS ON SHEET L3.1 AND AS SPECIFIED.
8. CONTRACTOR IS RESPONSIBLE FOR OBTAINING PHOTOGRAPHS OF ACTUAL LANDSCAPE MATERIALS AND SUBMITTING THEM TO THE LANDSCAPE ARCHITECT OF RECORD FOR APPROVAL PRIOR TO INSTALLATION.
9. PLANT MATERIAL SELECTED SHALL FOLLOW THE GUIDELINES OF THE AMERICAN STANDARD FOR NURSERY STOCK BY THE AMERICAN ASSOCIATION OF NURSERYMEN AND MEET OR EXCEED ALL SIZE REQUIREMENTS LISTED ON PLANT SCHEDULE.
10. ALL PLANTINGS SHALL BE MAINTAINED IN A HEALTHY STATE BY LANDSCAPE CONTRACTOR AND SHALL BE WARRANTED (FOR REPLACEMENT) FOR ONE (1) CALENDAR YEAR AFTER ACCEPTANCE OF THE LANDSCAPE INSTALLATION.



**KEY PLAN**  
PLAN NORTH TRUE NORTH

Project No.: 2023

Drawing Date: 01.17.2024  
Drawn: MSB  
Checked: ADB  
Scale: AS NOTED

**Issue Log:**

No.	Descriptor	Date

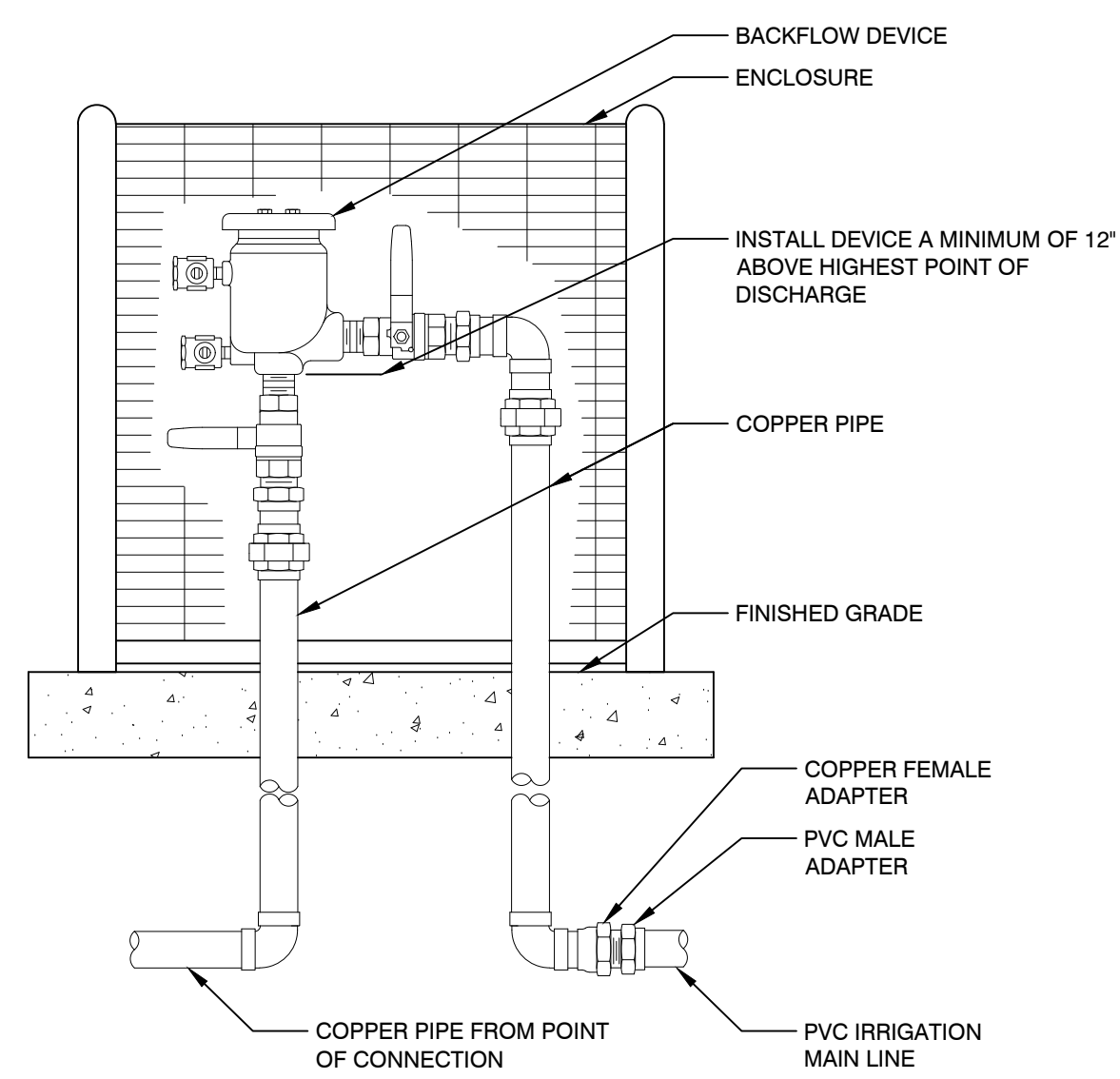
**Revisions:**

No.	Description	Date

This document is for interim review only

Planting Details 1

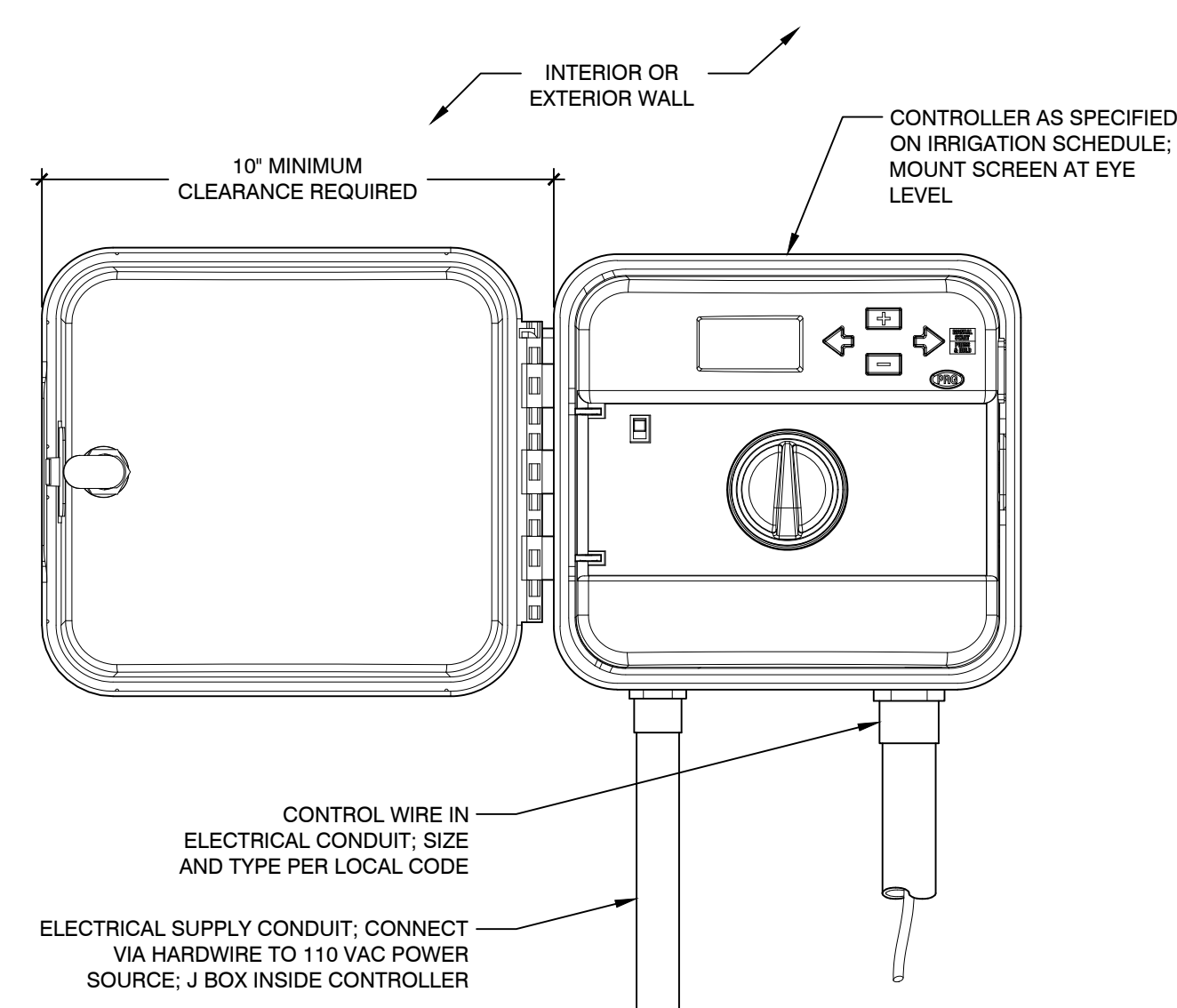
**L3.10**



NOTE: INSTALL BACKFLOW DEVICE PER LOCAL CODES. VERIFY LOCAL REQUIREMENTS PRIOR TO INSTALLATION.

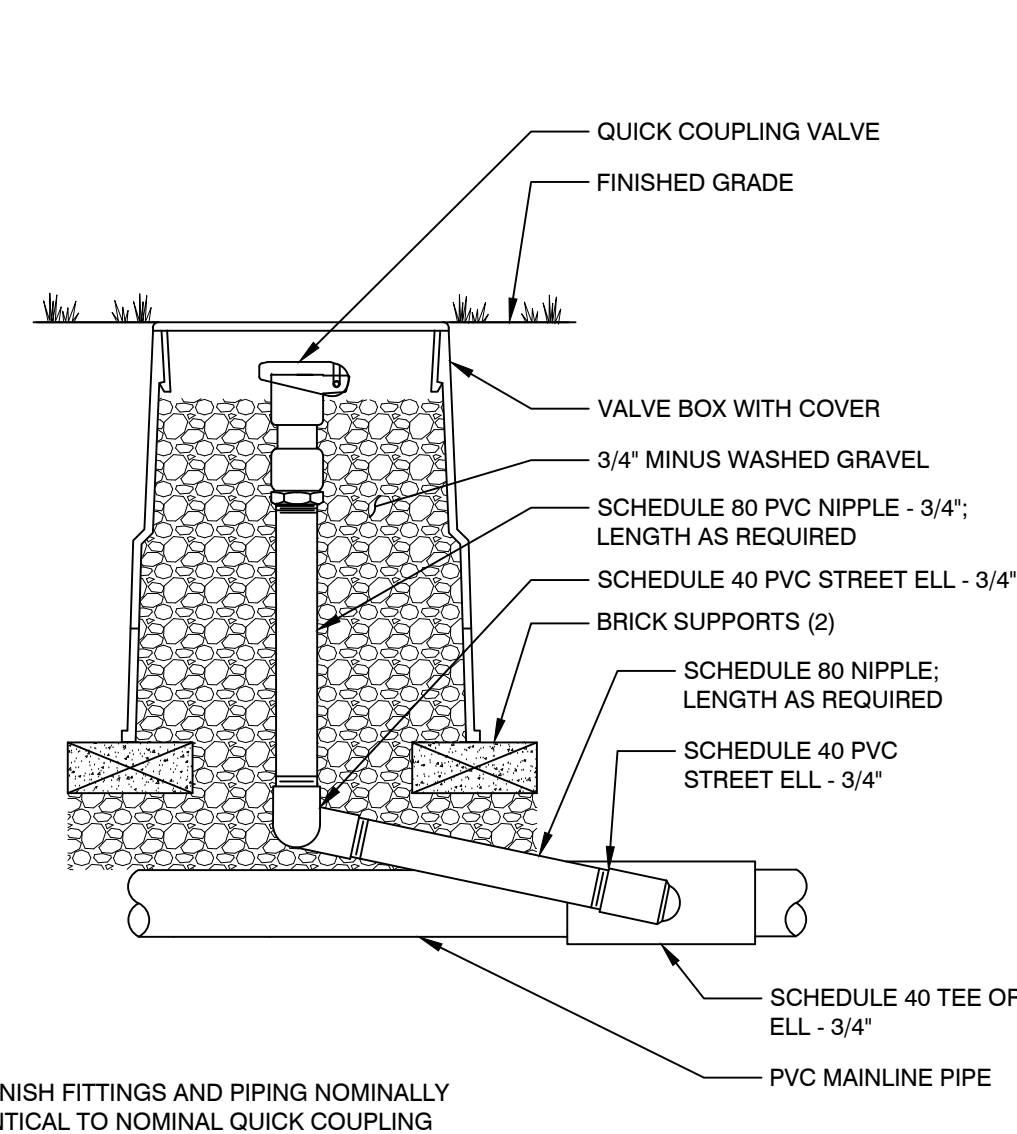
**1 BACKFLOW DEVICE**

NTS 0002-01



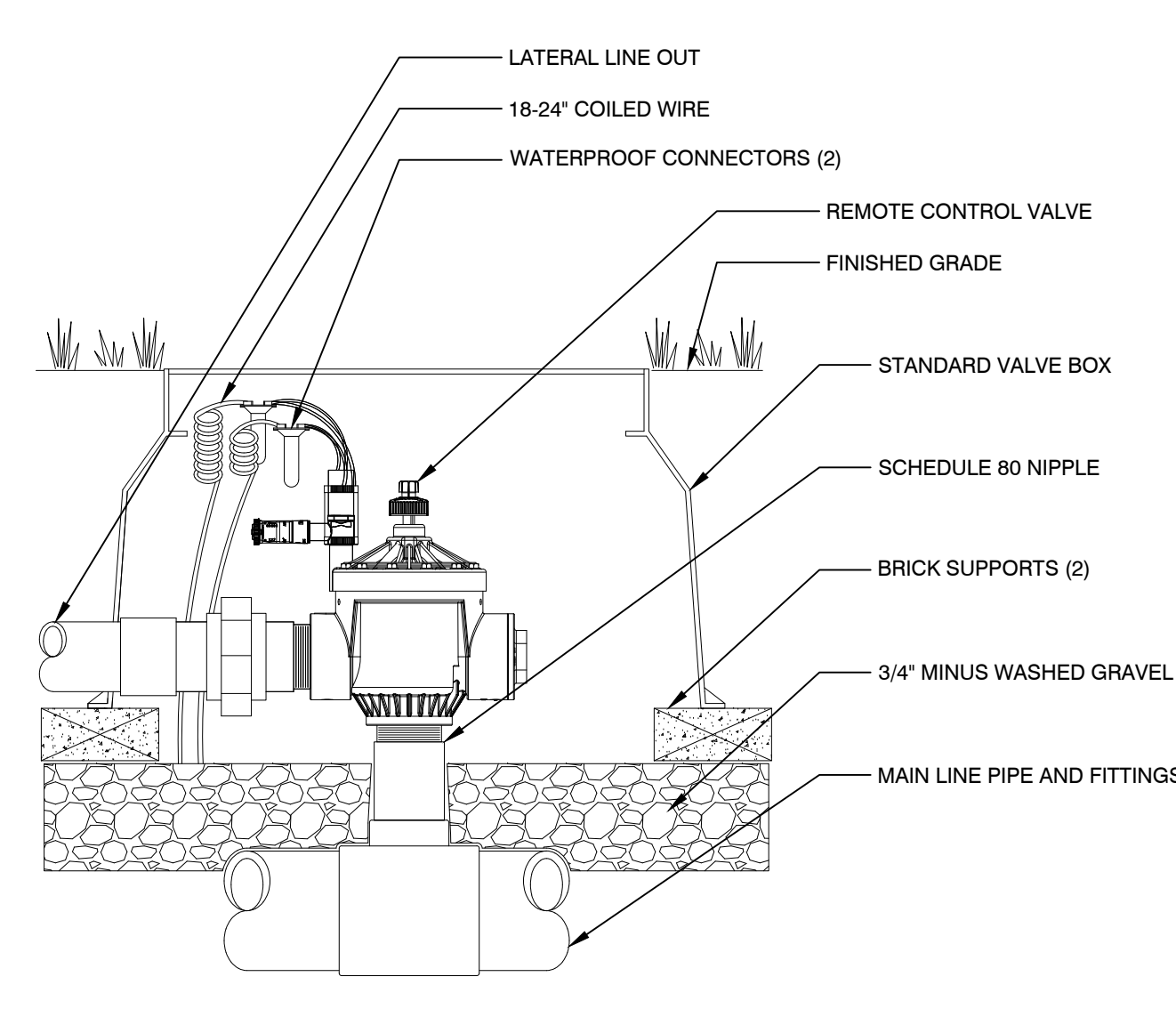
**2 IRRIGATION CONTROLLER**

NTS 0002-06



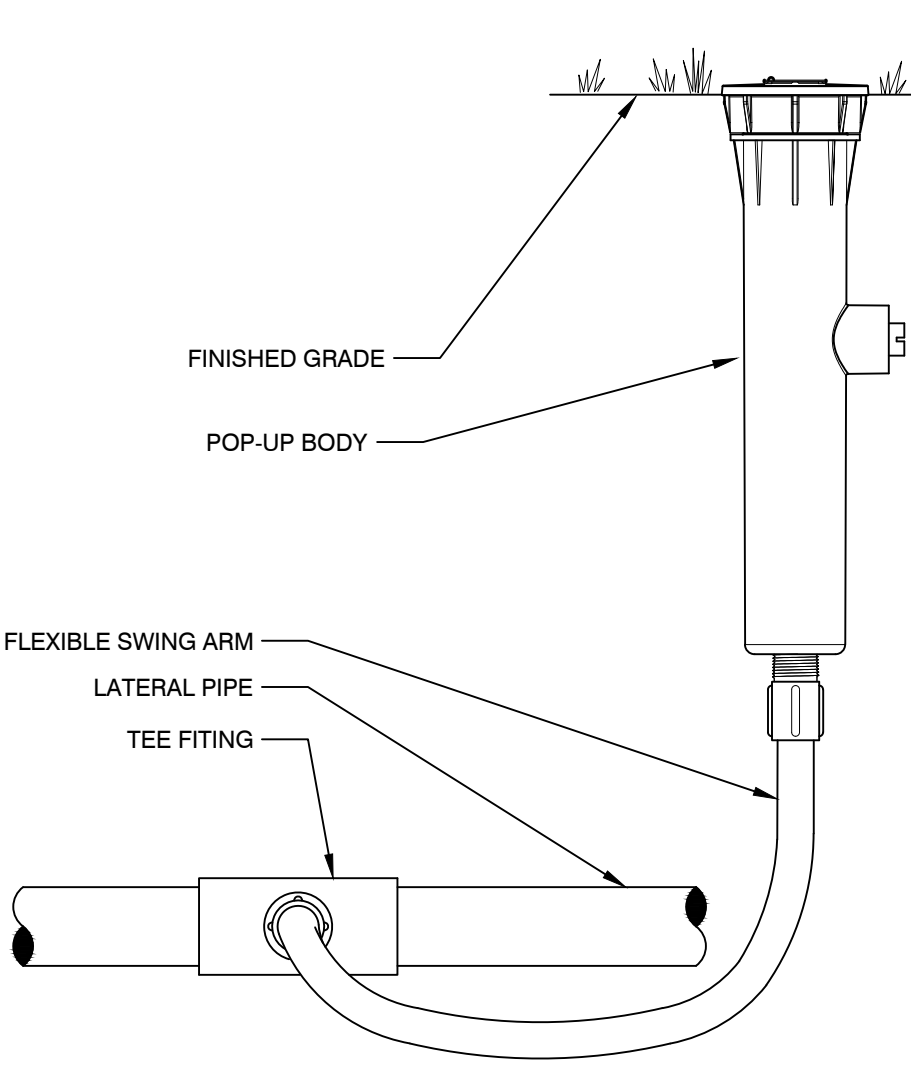
**3 QUICK COUPLER**

NTS 0002-04



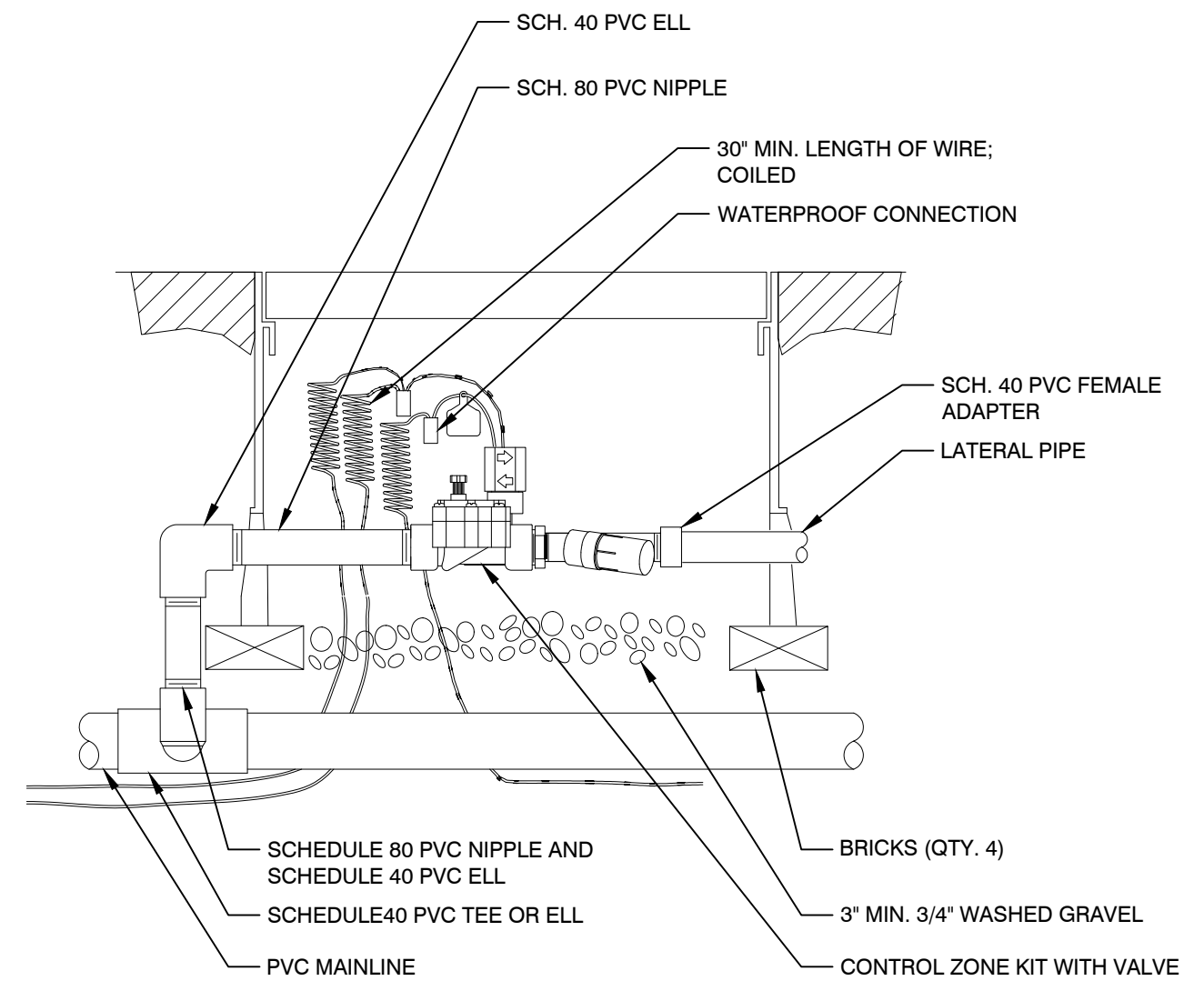
**4 ZONE VALVE**

NTS 0002-03



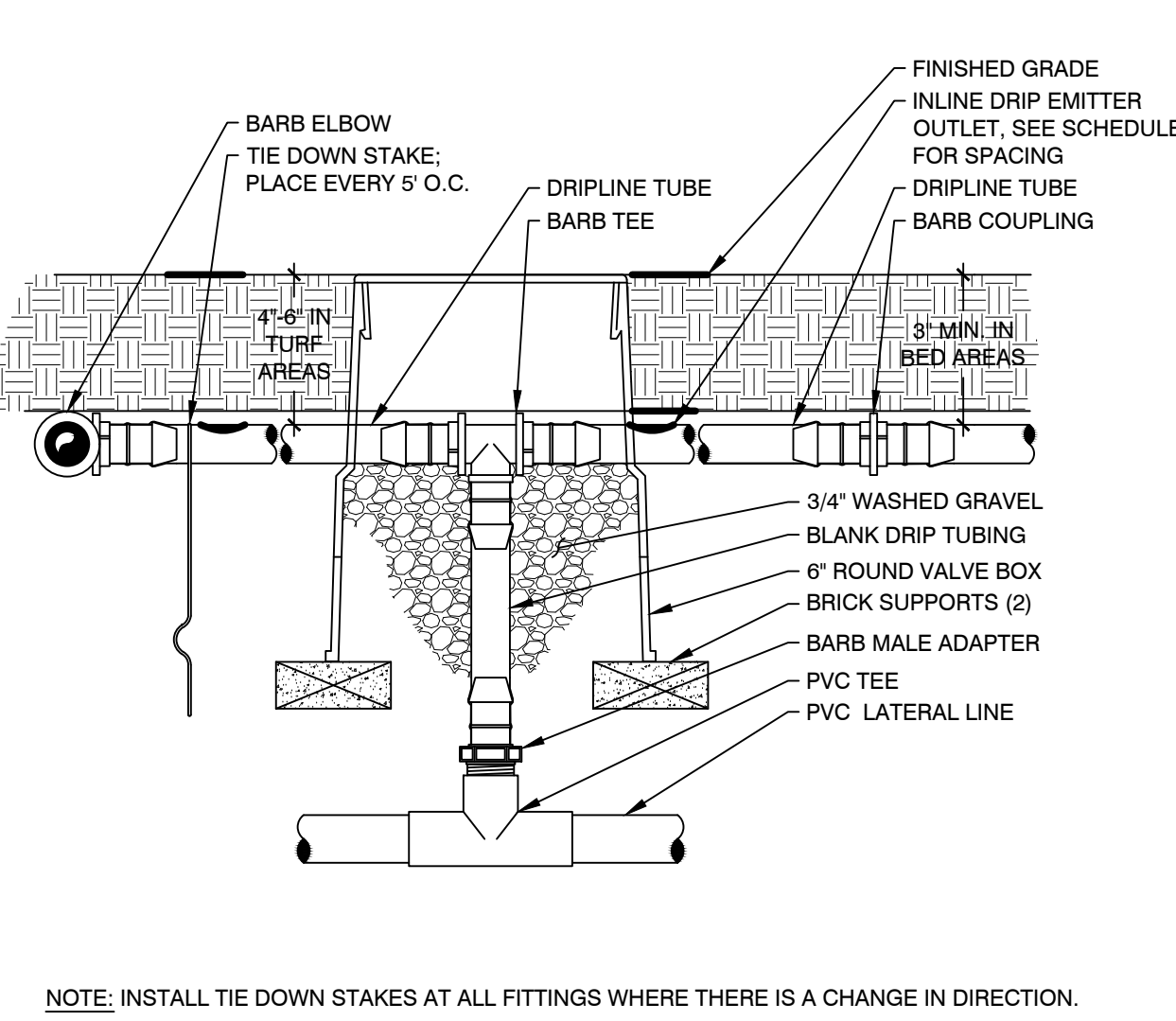
**5 POP UP BODY**

NTS 0002-14



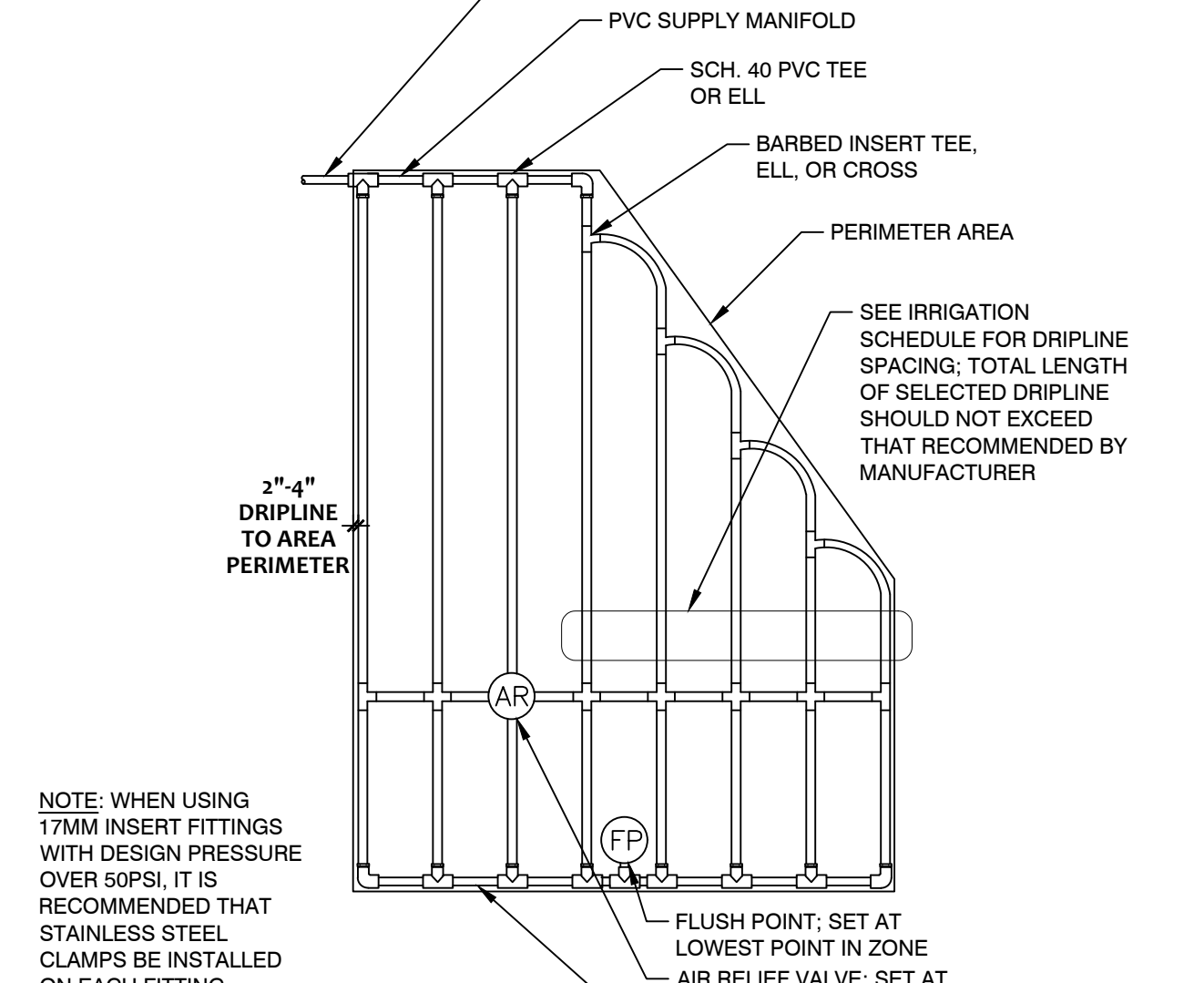
**6 DRIP ZONE VALVE**

NTS 0002-07



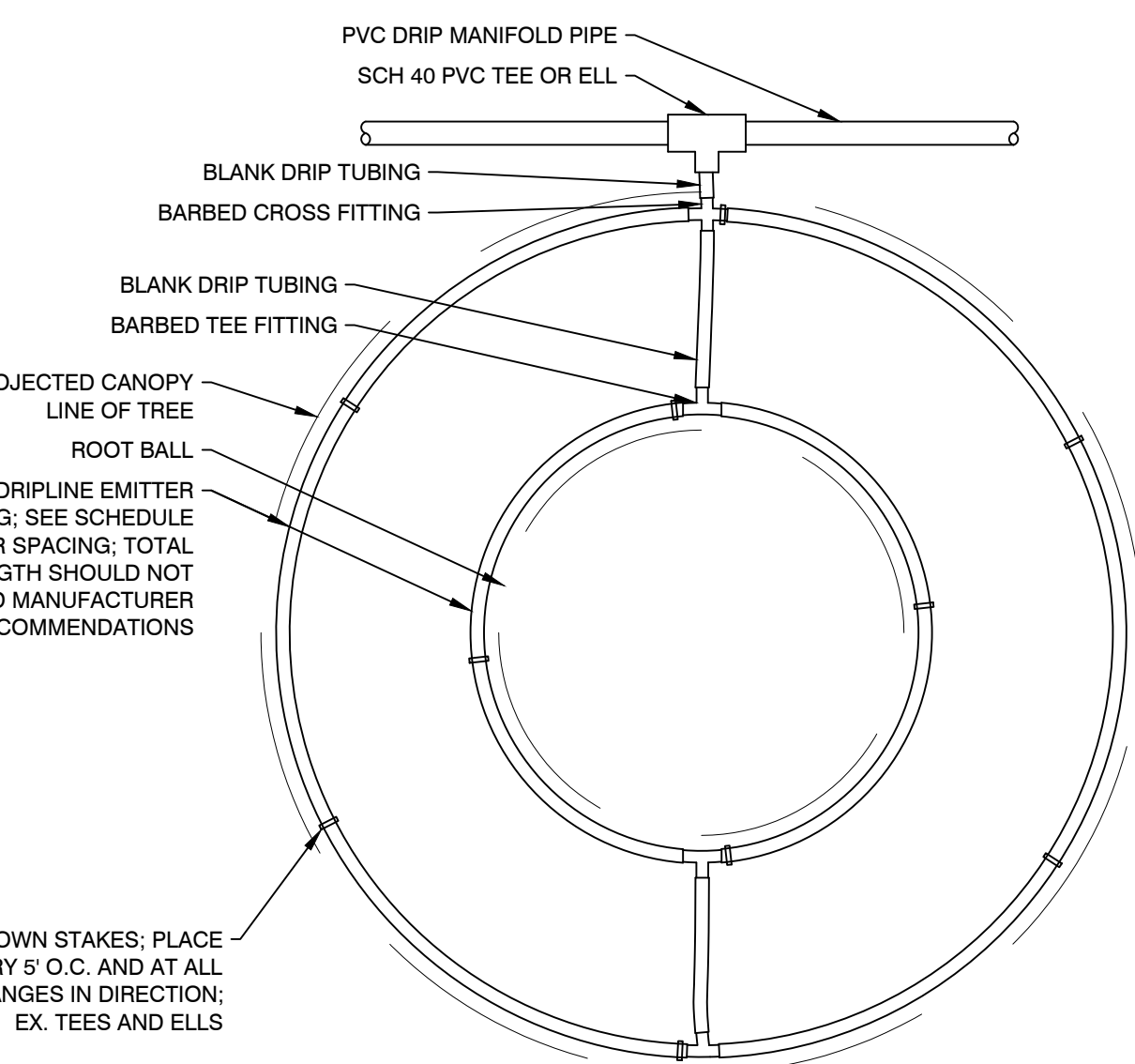
**7 PVC TO DRIPLINE ADAPTER**

NTS 0002-08



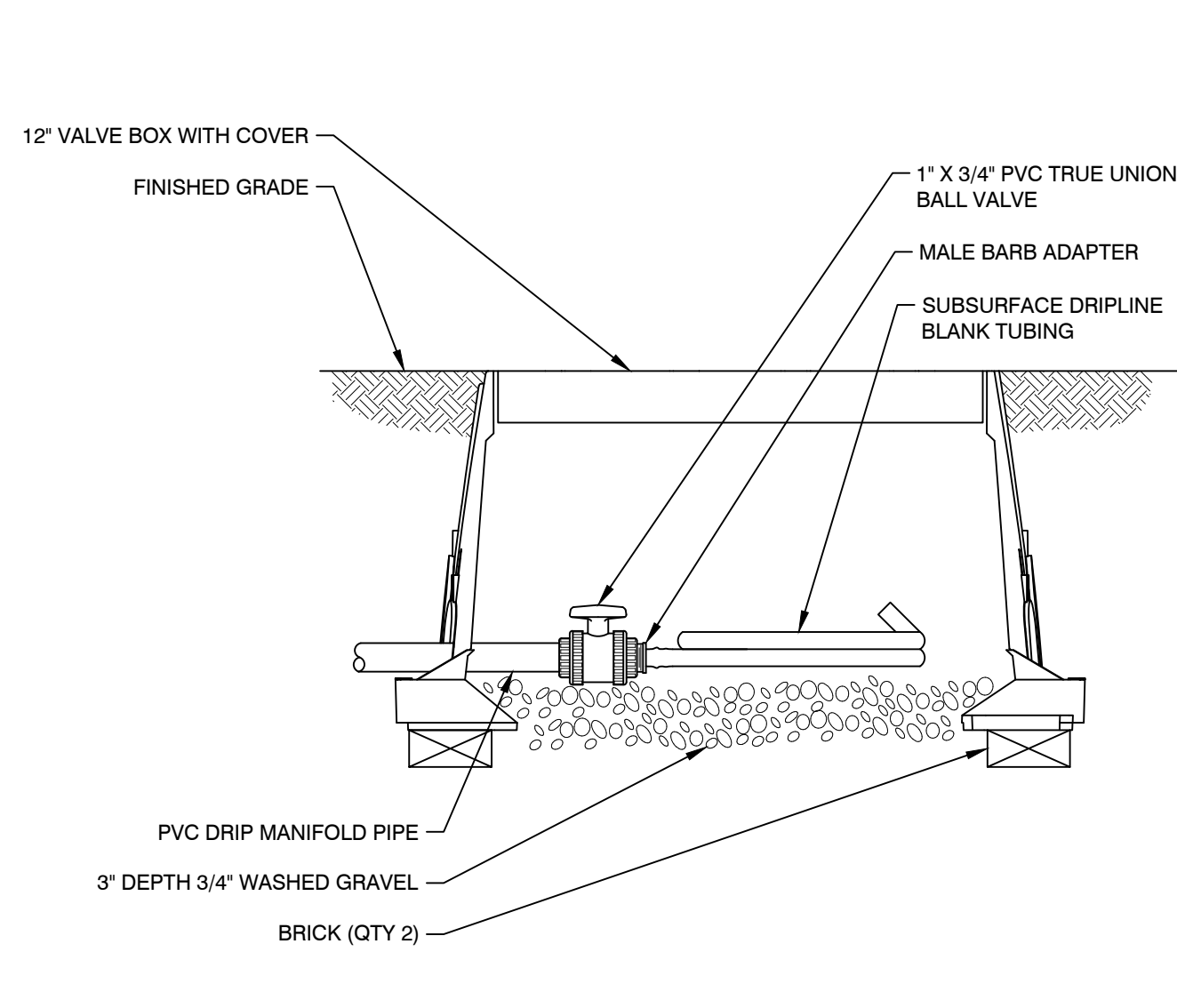
**8 DRIPLINE LAYOUT**

NTS 0002-09



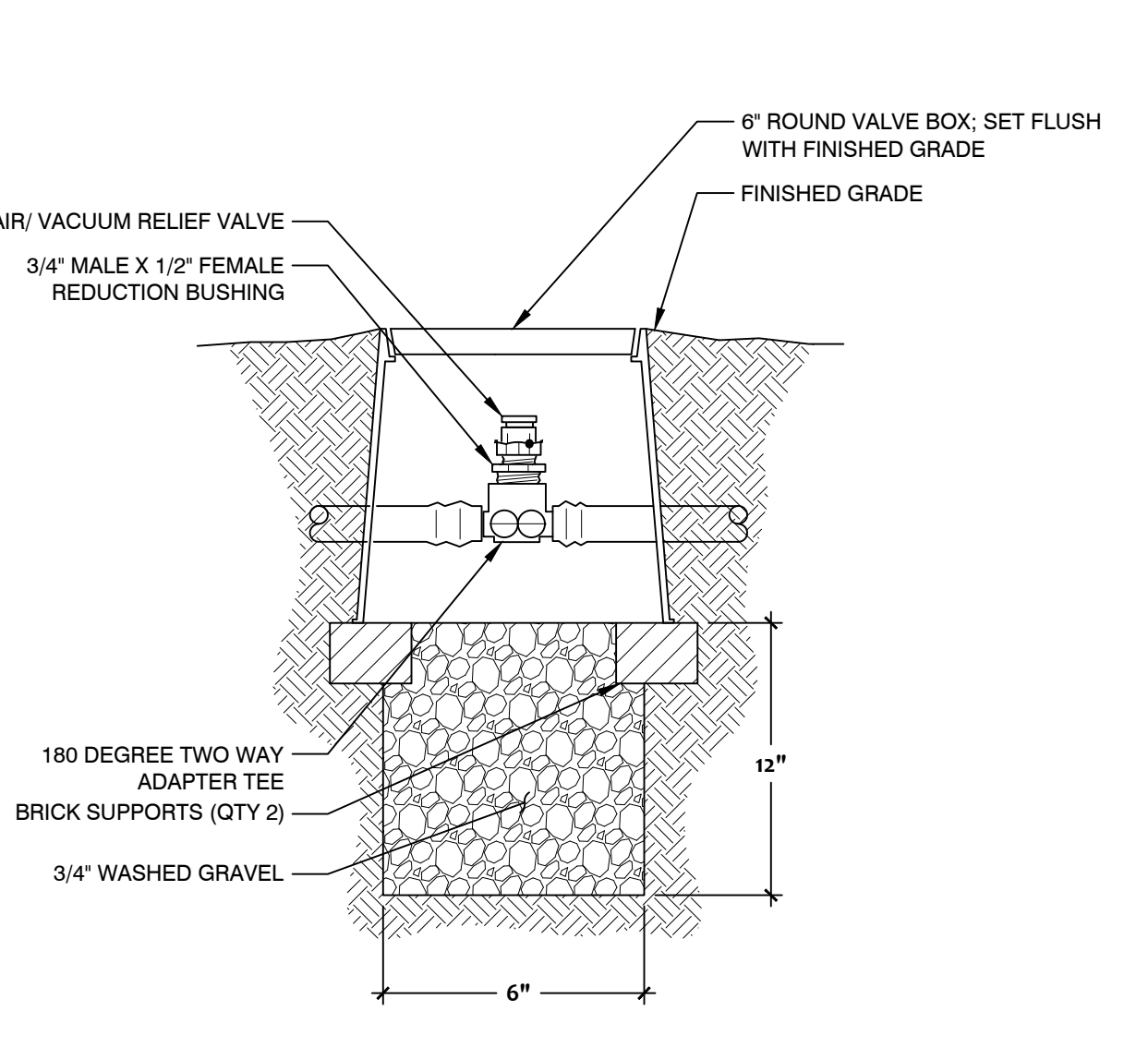
**9 DRIPLINE LAYOUT AROUND TREE**

NTS 0002-10



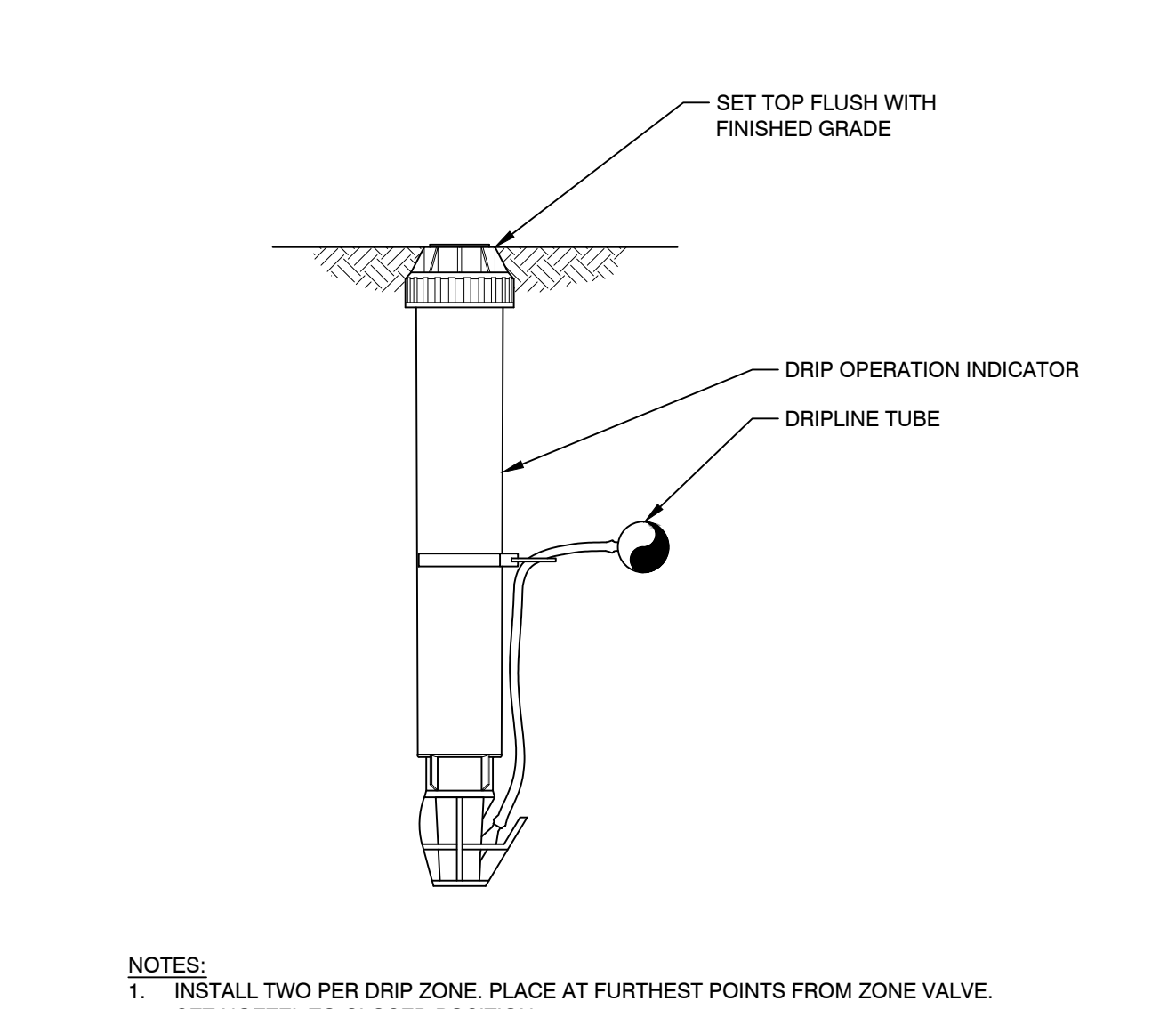
**10 DRIP MANUAL FLUSH VALVE**

NTS 0002-11



**11 DRIP AIR RELIEF VALVE**

NTS 0002-12



**12 DRIP OPERATION INDICATOR**

NTS 0002-13



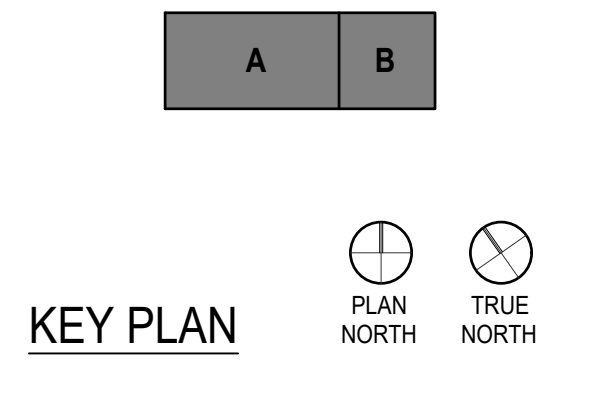
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 3700 DANFORD ROAD  
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FOR BID AND PERMIT



Project No.: 2023

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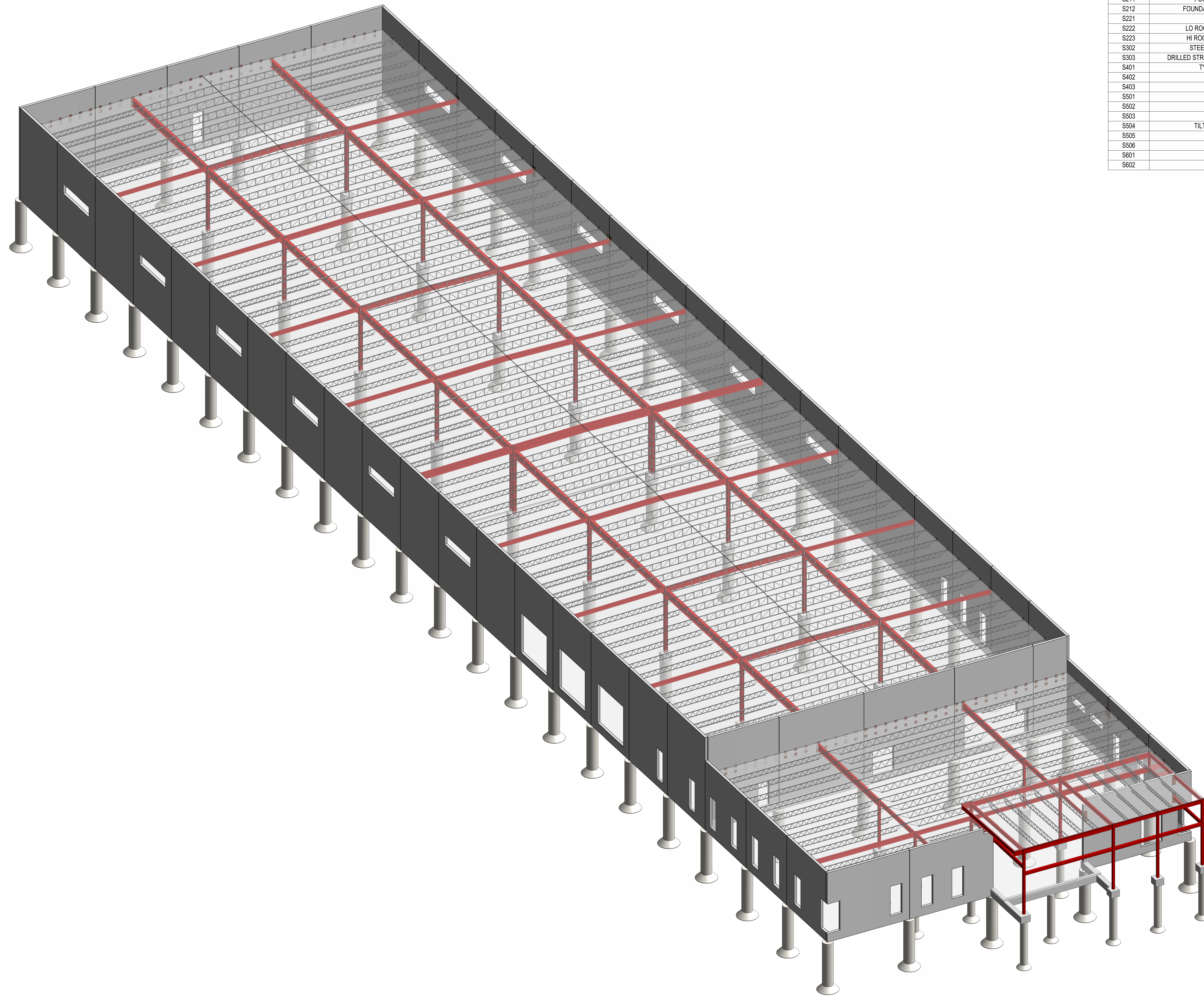
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Irrigation Details 1

NOTE:  
THESE DETAILS ARE PROVIDED AS A COURTESY AND CONTRACTOR SHOULD ALWAYS REFERENCE MANUFACTURER DETAILS FOR INSTALLATION INSTRUCTIONS.

This document is for interim review only





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S602	PANEL ELEVATIONS



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FBC Elections Administration Building

5700 BAYMORE RD.  
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 100% CONSTRUCTION DOCUMENTS

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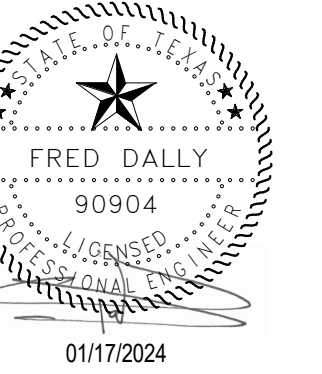
3D VIEW AND SHEET LIST

S001



1 3D VIEW

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**1. STRUCTURAL CONCEPT, STANDARDS AND LOADS**

**A. DESIGN CONCEPT:**  
THE STRUCTURE AS SHOWN HAS BEEN DESIGNED IN ACCORDANCE WITH THE BUILDING CODE REQUIREMENTS AND DESIGN STANDARDS TO SUPPORT THE FINAL BUILDING SERVICE LOADS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADDITIONAL SUPPORTS FOR THE STRUCTURE F NECESSITATED BY THE CONSTRUCTION SEQUENCE OR METHODS OF FABRICATION, HANDLING, ERECTION, AND OTHER CONSTRUCTION OPERATIONS.

**B. BUILDING CODES AND DESIGN STANDARDS:**

- INTERNATIONAL BUILDING CODE, 2015 EDITION.
- AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE), MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, ASCE 7-10, AS AMENDED.
- AMERICAN CONCRETE INSTITUTE (ACI), BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE, ACI 318, AS AMENDED.
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, 14TH EDITION (ASD), 2005, AS AMENDED.
- AMERICAN WELDING SOCIETY (AWS).
- STEEL JOIST INSTITUTE (SJI), STANDARD SPECIFICATIONS FOR OPEN WEB STEEL JOISTS AND JOIST GIRDERS.
- STEEL DECK INSTITUTE (SDI), DESIGN MANUAL FOR COMPOSITE DECKS, FORM DECKS, ROOF DECKS, AND CELLULAR METAL FLOOR DECK WITH ELECTRICAL DISTRIBUTION.
- AMERICAN IRON AND STEEL INSTITUTE (AISI), SPECIFICATION FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS, LATEST EDITION.

**C. GRAVITY LOADS:**  
SUPERIMPOSED LOADS ARE GIVEN IN POUNDS PER SQUARE FOOT (PSF).

BUILDING AREA	DEAD LOAD (PSF)	LIVE LOAD (PSF)
1. SLAB ON GRADE	0	100
2. ROOF	20	20
3. MECHANICAL AREAS	10	150(1)

\*EQUIPMENT WEIGHT E LARGER

**D. LATERAL DESIGN LOADS:**

1. WIND LOADS FOR AN ULTIMATE WIND SPEED OF 135 MPH 3-SECOND GUST, WITH EXPOSURE B AND A RISK CATEGORY II (ASCE 7-10 METHOD).

2. COMPONENT AND CLADDING PRESSURES ARE AS FOLLOWS:

TYPE	TRIBUTARY AREA	PRESSURES (PSF)		
		CORNER	PERIMETER	FIELD
WALLS	10 FT 2	-50,+46	-	-62,+46
ROOF	10 FT 2	-144,+21	-106,+21	-80,+21
PARAPET	10 FT 2	-92,+175	-	-81,+136.1
WALLS	100 FT 2	-92,+175	-	-48,+40
ROOF	100 FT 2	-99,+17	-83,+17	-63,+17
PARAPET	100 FT 2	-72,+123	-	-67,+107

- RE: IBC 2015 FOR DESCRIPTION OF CORNER, PERIMETER & FIELD.
- POSITIVE PRESSURES ARE PRESSURES ACTING TOWARD THE BUILDING.
- NEGATIVE PRESSURES ARE PRESSURES ACTING AWAY FROM THE BUILDING.
- VALUES ABOVE ARE FOR ULTIMATE WIND PRESSURES. THE ASD FACTOR FOR NOMINAL PRESSURES IS 0.6.
- THE CORNER ZONE IS DEFINED AS ANY WALL DISTANCE WITHIN 6.8 FT OF ANY CORNER OF THE BUILDING (6.8 FT).

**E. SEISMIC CRITERIA:**

- IMPORTANCE FACTOR: 1.00
- RISK CATEGORY: I
- MAPPED SPECTRAL RESPONSE ACCELERATIONS:
  - S<sub>e</sub>: 0.069
  - S<sub>1</sub>: 0.086
- SITE CLASS: D
- SPECTRAL RESPONSE COEFFICIENTS:
  - S<sub>DS</sub>: 0.074
  - S<sub>D1</sub>: 0.058
- SEISMIC DESIGN CATEGORY: A
- BASIC SEISMIC FORCE-RESISTING SYSTEM: "TBD" (EX: STRUCTURAL STEEL SYSTEMS NOT SPECIFICALLY DESIGNED FOR SEISMIC RESISTANCE)
- DESIGN BASE SHEAR: 0.029W
- RESPONSE MODIFICATION FACTOR (R): 2.5
- ANALYSIS PROCEDURE USED: "TBD" (EX: EQUIVALENT LATERAL FORCE PROCEDURE)

**2. GENERAL NOTES FOR CONSTRUCTION**

**A. CONSTRUCTION METHODS, PROCEDURES AND SEQUENCES ARE THE RESPONSIBILITY OF THE CONTRACTOR AND THE CONTRACTOR SHALL TAKE ALL THE NECESSARY MEANS TO MAINTAIN AND PROTECT THE STRUCTURAL INTEGRITY OF ALL CONSTRUCTION AT ALL STAGES.**

**B. THESE NOTES APPLY TO STRUCTURAL DOCUMENTS SEALED BY THE STRUCTURAL ENGINEER AND ARE INTENDED TO BE COMPLEMENTARY TO AND USED IN CONJUNCTION WITH THE PLANS AND SPECIFICATIONS, INCLUDING THOSE PREPARED BY OTHER DISCIPLINES. CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE ARCHITECT/STRUCTURAL ENGINEER IMMEDIATELY. ANY SUCH DISCREPANCIES SHALL BE RESOLVED TO THE MORE STRINGENT REQUIREMENTS, UNLESS OTHERWISE AUTHORIZED BY THE STRUCTURAL ENGINEER.**

**C. ANY DISCREPANCIES ON THE STRUCTURAL DOCUMENTS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT/STRUCTURAL ENGINEER PRIOR TO SUBMISSION OF BIDS OR PROPOSALS, OR IF NOT REASONABLY DISCOVERABLE DURING PREPARATION OF BIDS AND PROPOSALS, BEFORE COMMENCING THE WORK IN QUESTIONS. NO FIELD CHANGES OR DIVISIONS FROM THE DESIGN ARE TO BE MADE WITHOUT PRIOR WRITTEN APPROVAL OF THE ARCHITECT AND/OR STRUCTURAL ENGINEER. NO CHANGE ORDER CONSIDERATION WILL BE GIVEN TO CHANGES FOR WHICH THE ARCHITECT AND/OR ENGINEER WERE NOT CONTACTED PRIOR TO CONSTRUCTION OF THE AFFECTED ITEM.**

**D. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONSTRUCTION, INCLUDING EXISTING WORK, PRIOR TO COMMENCING WORK. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ARCHITECT/STRUCTURAL ENGINEER.**

**E. ALL PROPOSED SUBSTITUTIONS MUST BE EQUAL OR BETTER AND MUST BE REVIEWED BY THE ARCHITECT/ENGINEER PRIOR TO ANY PERMIT WORK AND PRIOR TO THE AWARD OF THE CONTRACT.**

**F. NOT ALL OPENINGS AND OTHER COMPONENTS THAT ARE REQUIRED HAVE BEEN SHOWN IN THE STRUCTURAL DRAWINGS. COORDINATE WITH THE ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS AND VERIFY THE LOCATIONS AND SIZES OF ALL CHASES, INSERTS, OPENINGS, SLEEVES, FINISHES, DEPRESSIONS, PADS AND OTHER PROJECT REQUIREMENTS. FLOOR PLAN WILL BE FURNISHED FOR THAT PURPOSE.**

**G. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE MECHANICAL, ELECTRICAL, PLUMBING AND ARCHITECTURAL DRAWINGS TO DETERMINE WHERE OPENINGS ARE REQUIRED IN REINFORCED CONCRETE BEAMS, SLABS AND WALLS.**

**H. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, DETAILING ALL THE OPENINGS, INCLUDING ADOPTED REINFORCEMENT AS SHOWN ON THE TYPICAL WALL, SLAB AND BEAM OPENING DETAILS FOR REVIEW.**

**I. ADDITIONAL REINFORCEMENT ABOVE THAT SHOWN IN THE TYPICAL SLAB AND BEAM OPENING DETAILS MAY BE REQUIRED AND WILL BE REVIEWED ON THE SHOP DRAWINGS.**

**J. USE THE MANUFACTURERS CERTIFIED DRAWINGS AND SPECIFICATIONS FOR THE EQUIPMENT ANCHORAGE AND DETAILS.**

**K. ALL CONSTRUCTION JOINTS SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE INCORPORATED INTO THE STRUCTURE. ADDITIONAL CONSTRUCTION JOINTS TO FACILITATE CONSTRUCTION SHALL BE LOCATED AND DETAILED ON THE SHOP DRAWINGS FOR REVIEW.**

**L. HORIZONTAL CONSTRUCTION JOINTS SHALL NOT BE PERMITTED IN BEAMS UNLESS SHOWN ON THE STRUCTURAL DRAWINGS.**

**M. ALL CONSTRUCTION AND CONTROL JOINTS FOR BEAMS WHICH ARE EXPOSED TO VIEW ARE TO BE LOCATED TO COINCIDE WITH THE ARCHITECTURAL RUSTICATION JOINTS AS SHOWN ON THE BUILDING ELEVATION SHEETS OR AS REVIEWED IN WRITING.**

**N. SHOP DRAWINGS**

1. THE TERM "SHOP DRAWINGS" INCLUDES FABRICATION, MANUFACTURING, ERECTION AND SETTING DRAWINGS, BROCHURES, CERTIFICATES, AND PRODUCT DATA DESCRIBING MATERIALS AND EQUIPMENT. SHOP DRAWINGS SHALL INCLUDE ALL PERTINENT INFORMATION REQUIRED FOR THE ENGINEER TO FULLY EVALUATE THE MATERIALS BEING REPRESENTED BY THE SUBMITTAL INCLUDING THE PHYSICAL PROPERTIES, DIMENSIONS, LOCATIONS AND METHOD OF INSTALLATION.

2. SHOP DRAWINGS WILL BEAR THE REVIEW STAMP OF THE CONTRACTOR INDICATING THAT HE HAS REVIEWED THE DRAWINGS FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS. COORDINATED ITEMS INCLUDED IN THE SUBMITTAL WITH RELATED ITEMS, AND VERIFIED AND COORDINATED DIMENSIONS.

3. REPRODUCTIONS OF THE ENGINEERING DRAWINGS WILL NOT BE ACCEPTABLE AS SHOP DRAWINGS.

4. ANY SHOP DRAWING NOT CONFORMING TO THESE REQUIREMENTS WILL BE CAUSE FOR REJECTION AND WILL BE RETURNED WITHOUT ANY FURTHER ACTION.

5. STRUCTURAL SUBMITTALS REQUIRED FOR APPROVAL INCLUDE, BUT ARE NOT LIMITED TO:

- CONCRETE ACCESSORIES (MANUFACTURERS PRODUCT DATA)
- STEEL REINFORCING
- CONCRETE MIX DESIGN
- CONTROL JOINT LAYOUT
- CONCRETE MATERIAL CERTIFICATES
- STRUCTURAL STEEL FRAMING
- STRUCTURAL STEEL CONNECTION CALCULATIONS
- STEEL ROOF DECK
- COLD FORMED METAL FRAMING
- COLD FORMED METAL FRAMING CALCULATIONS
- MISC. STEEL FABRICATIONS

**3. CONCRETE**

**A. CONCRETE SCHEDULE:**

BUILDING COMPONENT	28 DAY CYLINDER COMPRESSIVE STRENGTH POUNDS PER SQUARE INCH(Psi)				
	NORMAL WEIGHT			MAX AGGREGATE SIZE (IN)	WC RATIO
	3000	3500	4000		
1. DRILLED PIERS	•	•	•	1 1/2"	5-7 0.55
2. SLAB ON GRADE	•	•	•	1"	4-6 0.45
3. PLINTHS AND GRADE BEAMS	•	•	•	1"	4-6 0.45
4. TILT UP PANELS	•	•	•	3/4"	4-6 0.45
5. ALL OTHER CONCRETE	•	•	•	1"	4-6 0.52

**B. PROVIDE DEFORMED NUB BULLET STEEL BARS CONFORMING TO ASTM A615, GRADE 60. ALL REINFORCING STEEL SHALL BE SECURELY HELD IN PLACE. PROVIDE ADDITIONAL BARS OR STIRRUPS FOR SUPPORT AS REQUIRED.**

**C. WELDED WIRE FABRIC SHALL CONSIST OF FLAT SHEETS AND SHALL CONFORM TO ASTM A185, WITH A MINIMUM YIELD STRENGTH OF 65.0 KSI.**

**D. PROVIDE FULL EMBEDMENT WITH STANDARD 90 DEGREE HOOKS FOR ALL DOWELS. IF NOT OTHERWISE SPECIFIED, THE DOWEL SIZE AND SPACING SHALL BE THE SAME AS THE MAIN REINFORCING.**

**E. WHEN REINFORCING STEEL IN GRADE BEAMS, WALLS, SLABS AND BEAMS, IS NOTED AS CONTINUOUS, SPLICE REINFORCING STEEL ONLY WHEN UNAVOIDABLE DUE TO STOCK LENGTHS. STAGGER ALL SPLICES A MINIMUM OF 4'-0". ADJACENT BAR SPLICES ARE NOT ACCEPTABLE. LOCATE THE TOP BAR SPLICES WITHIN THE MIDDLE HALF OF THE SPAN AND LOCATE THE BOTTOM BAR SPLICES AT SUPPORTS OR BETWEEN SUPPORTS AND 1/3 SPAN POINT, UNLESS NOTED OTHERWISE ON PLANS, DETAILS OR SCHEDULES.**

**F. PROVIDE INTERIOR AND EXTERIOR HORIZONTAL LAPPED CORNER BARS AT ALL CORNERS TO MATCH THE SIZE, TYPE AND SPACING OF THE WALL AND GRADE BEAM REINFORCING.**

**G. UNLESS SPECIFICALLY NOTED, SCHEDULED OR DETAILED OTHERWISE, PROVIDE DEVELOPMENT LENGTH FOR REINFORCING IN CONCRETE COMPONENTS IN ACCORDANCE WITH THE SCHEDULE IN NOTE H BELOW. THIS SCHEDULE SHALL APPLY TO ALL DEVELOPMENT LENGTHS NOT OTHERWISE NOTED.**

**H. REINFORCING BAR DEVELOPMENT LENGTHS (L<sub>d</sub>) IN INCHES FOR VARIOUS CONCRETE STRENGTHS IN POUNDS PER SQUARE INCH (PSI). TOP BARS ARE DEFINED AS HORIZONTAL REINFORCING SO PLACED IN A MEMBER THAT MORE THAN 12 INCHES OF CONCRETE IS CAST BELOW THE BAR. ALL OTHER CONDITIONS ARE CONSIDERED BOTTOM BARS FOR DEVELOPMENT AND SPLICE LENGTH PURPOSES.**

BAR SIZE GRADE 60	L <sub>d</sub> FOR TOP BARS				L <sub>d</sub> FOR BOTTOM BARS			
	28 DAY CYLINDER CONCRETE STRENGTH (PSI)				28 DAY CYLINDER CONCRETE STRENGTH (PSI)			
	3000/3500	4000	5000	6000	3000/3500	4000	5000	6000
#3	22	19	17	16	17	15	13	12
#4	28	25	23	21	22	19	17	16
#5	36	31	28	26	28	24	22	20
#6	43	37	34	31	33	29	26	24
#7	63	54	49	45	48	42	38	34
#8	72	62	56	51	55	48	43	39
#9	81	70	62	57	62	54	48	44
#10	89	78	69	63	69	60	53	49
#11	98	85	76	70	76	66	59	54

1. WHEN TWO BARS OF DIFFERENT SIZES ARE LAPPED, THE SMALLER SIZE SHALL GOVERN THE LAP LENGTH UNLESS SPECIFICALLY NOTED.

2. WELDED OR MECHANICAL SPLICES CAPABLE OF DEVELOPING 125% OF THE BAR YIELD STRENGTH MAY BE USED IN LIEU OF THE LAPS. SUCH SPLICES MAY BE EITHER FULL BUTT WELDS OR SERIES "C" COWELDS OR EQUAL.

**J. AT LAP SPLICES, PROVIDE LAP SPLICE LENGTHS FOR REINFORCING BARS 1.3 TIMES THE L<sub>d</sub> SHOWN IN TABLE H ABOVE.**

**K. THE GENERAL NOTES, LAP LENGTHS OR DETAILS PERTAINING TO REINFORCING STEEL AS SHOWN ON THE DETAIL SHEETS OR OTHER SCHEDULES SHALL SUPERSEDE THE NOTES SHOWN ON THIS SHEET.**

**L. PROVIDE THE FOLLOWING COVER FOR CAST-IN-PLACE CONCRETE REINFORCING:**

- UNFORMED SURFACES IN CONTACT WITH EARTH: 3 INCHES
- UNFORMED SURFACES OVER MOISTURE BARRIER: 2 INCHES
- FORMED SURFACES EXPOSED TO EARTH OR WEATHER
  - #8 AND LARGER: 2 INCHES
  - #5 AND SMALLER: 1 1/2" INCHES
- FORMED SURFACES NOT EXPOSED TO EARTH OR WEATHER
  - #8 SLABS AND WALLS: 3/4 INCHES
  - #5 BEAMS AND COLUMNS: 1 1/2 INCHES

**4. EXCAVATION, BACKFILLING & FOUNDATIONS**

**A. A GEOTECHNICAL EXPLORATION OF SUBSURFACE CONDITIONS, CONTAINING TEST BORINGS, LABORATORY TEST, ENGINEERING ANALYSIS AND FOUNDATION RECOMMENDATIONS, PERFORMED BY **GEOSCIENCE ENGINEERING AND TESTING, INC.** DATED **NOVEMBER 21, 2023**, REPORT NO. **230512413**, IS AVAILABLE FOR REVIEW.**

**B. MAINTAIN PROPER SITE DRAINAGE DURING CONSTRUCTION SO THAT PONING OF WATER DOES NOT OCCUR IN THE BUILDING AREA.**

**C. SUB-GRADE PREPARATION:**

- PERFORM DEMOLITION OF EXISTING STRUCTURES AS REQUIRED BY THE GEOTECHNICAL REPORT. THE ENTIRE VOLUME OF THE EXCAVATIONS CREATED BY DEMOLITION AND REMOVAL OF EXISTING STRUCTURES SHOULD BE BACKFILLED WITH ENGINEER (SELECT) FILL THAT IS PROPERLY PLACED AND COMPACTED.
- EXCAVATE EXISTING SOILS AS REQUIRED TO REMOVE ALL EXISTING VEGETATION, ROOTS AND DELETERIOUS MATERIALS FROM THE PROPOSED BUILDING AREA, AND AS REQUIRED BY GEOTECHNICAL REPORT. THE CLEARING SHOULD EXTEND BEYOND THE BUILDING EDGES. ONCE ROUGH GRADE IS ESTABLISHED, THE EXPOSED SURFACE SHOULD BE PROOF-ROLLED. ANY SOFT POCKETS OF SOFT OR WEAK SOILS ENCOUNTERED SHOULD BE REMOVED. BUILD BUILDING PAD AS REQUIRED BY GEOTECHNICAL REPORT.
- BUILDING PAD UNDER SLAB ON GRADE SHALL BE PREPARED TO PROVIDE AN OWNER APPROVED PVR OF 1" OR LESS BASED ON RECOMMENDATIONS IN THE PROJECT GEOTECHNICAL REPORT.

**D. FOUNDATIONS HAVE BEEN DESIGNED FOR A NET ALLOWABLE BEARING PRESSURE OF 4,000 PSF AT A MINIMUM EMBEDMENT DEPTH OF 15'-0" BELOW EXISTING GRADE ELEVATION.**

**E. REFER TO THE GEOTECHNICAL EXPLORATION FOR ADDITIONAL INFORMATION.**

**F. INSTALL SLAB ON GRADE OVER 15 MIL VAPOR BARRIER.**

**5. STRUCTURAL STEEL**

**A. ROLLED SHAPES:**

1. ALL STRUCTURAL STEEL FOR ALL THE HORIZONTAL FRAMING MEMBER SHALL CONFORM TO ASTM A992, GRADE 50, UNLESS OTHERWISE NOTED.

2. ALL STRUCTURAL STEEL FOR HOLLOW STRUCTURAL SECTIONS SHALL CONFORM TO ASTM A500, GRADE B WITH A MINIMUM YIELD OF 48 KSI, UNLESS OTHERWISE NOTED.

3. ALL STRUCTURAL STEEL FOR PIPE SHALL CONFORM TO ASTM A53, TYPE E OR S, GRADE B, UNLESS OTHERWISE NOTED.

4. ALL STRUCTURAL STEEL FOR ANGLES, PLATES AND MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36, UNLESS OTHERWISE NOTED.

5. ALL EXPOSED STEEL TO BE GALVANIZED.

**B. CONNECTIONS**

1. THE DESIGN OF STRUCTURAL STEEL CONNECTIONS IS THE RESPONSIBILITY OF THE CONTRACTOR AND THE STEEL FABRICATOR. THE DESIGN OF THE CONNECTION SHALL BE PERFORMED BY A REGISTERED PROFESSIONAL ENGINEER EMPLOYED BY THE STEEL FABRICATOR. THE DETAILS AND CALCULATIONS SHALL INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING:

- ALL WELD SIZES AND LENGTHS
  - ALL BOLT SIZES, LOCATIONS, QUANTITIES AND GRADES
  - ALL PLATE AND ANGLE SIZES, THICKNESS AND DIMENSIONS
  - ALL WORK POINT LOCATIONS AND RELATED INFORMATION
2. PROVIDE STANDARD BOLTED CONNECTIONS CONFORMING TO AISC BOLTED CONNECTIONS, USING ASTM A325 OR A490 BOLTS. FOR THE BEAM END SHEARS INDICATED IN THE DOCUMENTS, PROVIDE MINIMUM OF TWO BOLTS FOR ALL CONNECTIONS.
3. ALL WELDED CONNECTIONS SHALL CONFORM TO AISC UNLESS OTHERWISE NOTED.
4. SURVEY ALL PLANS, DETAILS, SECTIONS, SCHEDULES AND SPECIFICATIONS FOR SPECIAL CONNECTIONS.
5. UNLESS OTHERWISE NOTED AND/OR SPECIFIED, ALL BEAM CONNECTIONS SHALL BE DESIGNED TO SUPPORT 1/2 THE TOTAL UNIFORM LOAD FOR THE APPLICABLE MEMBER SIZE AND SPAN AS DETERMINED BY THE TABLES FOR ALLOWABLE UNIFORM LOADS ON BEAM IN THE **16TH** EDITION OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL OF STEEL CONSTRUCTION (ASD).

6. WHERE BEAMS ARE TO RECEIVE HEADED SHEAR CONNECTORS, DESIGN THOSE BEAM CONNECTIONS FOR THE REACTION SHOWN. IF REACTIONS ARE NOT SHOWN, DESIGN THE CONNECTIONS TO SUPPORT 40 PERCENT OF THE MAXIMUM WEB SHEAR, V, FOR THE APPLICABLE MEMBER SIZE AS DETERMINED BY THE TABLES FOR ALLOWABLE UNIFORM LOADS ON BEAMS IN THE **16TH** EDITION OF THE AISC MANUAL.

7. MOMENT CONNECTIONS SHOWN SHALL BE DESIGNED TO FULLY DEVELOP THE SECTION IN FLEXURE AND TO SUPPORT 1/2 THE TOTAL UNIFORM LOAD FOR SHEAR AS DESCRIBED IN NOTE 5 ABOVE.

8. WHERE FILLET WELD IS NOT SHOWN ON DETAIL, ITS SIZE SHALL BE ASSUMED TO BE THE PLATE THICKNESS OF THE THINNEST PIECE MINUS 1/16"

**C. WELDS**

1. CONFORM TO "CODE FOR WELDING IN BUILDING CONSTRUCTION" BY THE AMERICAN WELDING SOCIETY, LATEST EDITION.

2. WELDS ON INDICATED ON DRAWINGS ARE TO BE FILLET ALL AROUND AS PRESCRIBED BY AISC SPECIFICATION. PROVIDE WELDING OF CONTINUOUS MEMBERS OF 2 INCHES OF 3/16" INCH FILLET STITCH WELDS IS 12 INCHES OC, STAGGERED EACH SIDE, UNLESS OTHERWISE NOTED.

3. FIELD PAINT ALL WELDS W/ "GALVALUME" BY Z.R.C. OR APPROVED EQUAL ARC WELDING ELECTRODES.

4. METAL DECK - E80X8 STRUCTURAL STUDS - E8022 OR E6011, 3/32" RODS.

5. SIZE - ALL FILLETS ARE 1/16" LESS THAN MINIMUM THICKNESS TO BE WELDED

6. PROVIDE ULTRASONIC INSPECTION BY THE TESTING LABORATORY FOR ALL WELDS INDICATED AS PENETRATION WELDS.

**D. HEADED SHEAR CONNECTORS**

1. ALL HEADED SHEAR CONNECTORS SHALL BE 3/4 IN. DIAMETER STUDS x 4 1/2 IN. LONG AFTER WELDING AND SHALL CONFORM TO ASTM A108 UNLESS OTHERWISE NOTED.

2. PLACE MAXIMUM NUMBER OF STUDS IN A SINGLE ROW PATTERN AND THE BALANCE IN A DOUBLE ROW PATTERN AS NECESSARY TO SATISFY THE AISC SPACING REQUIREMENT.

**E. OPEN WEB STEEL JOISTS:**

1. AS APPLICABLE FOR THE OPEN WEB STEEL JOIST TYPE INDICATED ON THE DRAWINGS, CONFORMING TO SJI OR AISC, WHICHEVER IS MORE STRINGENT.

2. PROVIDE JOIST BRIDGING IN ACCORDANCE WITH SJI.

3. DESIGN ROOF JOISTS WITH GOVERNING LOAD COMBINATIONS WITH UPLIFT PRESSURES INDICATED ON COMPONENT AND CLADDING PRESSURES TABLE.

**F. STEEL DECK:**

**TYPE 1**

1. PROVIDE STEEL ROOF DECK 1 1/2" DEEP TYPE B 20 GAUGE STEEL SHEETS AND CONFORMING TO ASTM A653, STRUCTURAL STEEL (SS), GRADE 33, GALVANIZED COATING DESIGNATION G60.

2. PROVIDE STEEL ROOF DECK WITH THE FOLLOWING MINIMUM SECTION PROPERTIES:

- MOMENT OF INERTIA: I = 201 INCHES<sup>4</sup> /FOOT WIDTH
  - SECTION MODULUS: S<sub>x</sub> = 234 INCHES<sup>3</sup> /FOOT WIDTH
  - SECTION MODULUS: S<sub>y</sub> = 247 INCHES<sup>3</sup> /FOOT WIDTH
3. ATTACH STEEL ROOF DECK TO STEEL SUPPORTS AND AT SIDE LAPS AS FOLLOWS:

- POWDER-ACTUATED FASTENERS:
  - SUPPORTS: "HILTI" X-SH404 AND "HILTI" X-ENP-19L15, 3/8" PATTERN SIDELAP, #10 "TEK" @ 12" O.C. MAXIMUM
- SCREWS:
  - SUPPORTS: #12 "TEK" SCREWS, 3/8" PATTERN SIDELAP, #10 "TEK" @ 12" O.C. MAXIMUM

**6. INDEPENDENT TESTING LABORATORY & SPECIAL INSPECTIONS**

**A. A GEOTECHNICAL EXPLORATION OF SUBSURFACE CONDITIONS, CONTAINING TEST BORINGS, LABORATORY TEST, ENGINEERING ANALYSIS AND FOUNDATION RECOMMENDATIONS, PERFORMED BY **GEOSCIENCE ENGINEERING AND TESTING, INC.** DATED **NOVEMBER 21, 2023**, REPORT NO. **230512413**, IS AVAILABLE FOR REVIEW.**

**B. EMPLOYMENT OF A TESTING LABORATORY IN NO WAY RELIEVES THE CONTRACTOR OF ANY OBLIGATION TO PERFORM WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.**

**C. CONTRACTOR RESPONSIBILITIES:**

- DELIVER TO LABORATORY AT DESIGNATED LOCATION ADEQUATE SAMPLES OF MATERIALS PROPOSED TO BE USED WHICH REQUIRE TESTING, TOGETHER WITH PROPOSED MIX DESIGNS.
- COOPERATE WITH LABORATORY PERSONNEL AND PROVIDE ACCESS TO WORK AND TO MANUFACTURERS FACILITIES.
- PROVIDE INCIDENTAL LABOR AND FACILITIES TO PROVIDE ACCESS IN WORK TO BE TESTED. TO OBTAIN AND HANDLE SAMPLES AT THE SITE OR AT SOURCE OF PRODUCTS TO BE TESTED, TO FACILITATE TEST AND INSPECTIONS AND FOR STORAGE AND CURING OF TEST SAMPLES.
- NOTIFY LABORATORY OF MATERIAL SOURCES AND FURNISH NECESSARY QUANTITIES OF REPRESENTATIVE SAMPLES OF MATERIALS PROPOSED FOR USE WHICH ARE REQUIRED TO BE TESTED.

5. NOTIFY ARCHITECT AND LABORATORY 24 HOURS PRIOR TO EXPECTED TIME FOR OPERATIONS REQUIRING INSPECTION AND TESTING SERVICES.

6. ADVISE LABORATORY IN A TIMELY FASHION TO COMPLETE REQUIRED INSPECTION AND TESTING PRIOR TO SUBSEQUENT WORK BEING PERFORMED.

7. PAY FOR ALL SUBSEQUENT RE-TESTING OF PRODUCTS OR SYSTEMS FOUND TO BE DEFECTIVE OR OTHERWISE NOT IN ACCORDANCE WITH SPECIFICATION REQUIREMENTS. REMOVE REJECTED PRODUCTS AND REPLACE WITH PRODUCTS OF SPECIFIED QUALITY.

**D. SPECIAL INSTRUCTIONS:**

1. THE OWNER SHALL EMPLOY ONE OR MORE SPECIAL INSPECTOR(S) TO PROVIDE INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF CONSTRUCTION LISTED IN THIS SECTION. THE SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO SHALL DEMONSTRATE COMPETENCE TO THE INSPECTIONS BEING PERFORMED TO THE SAT



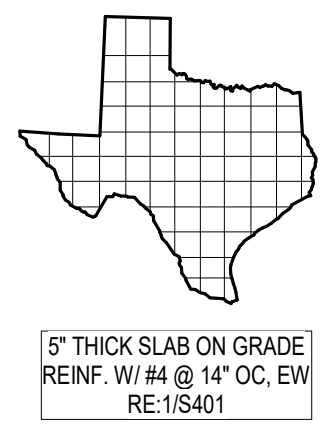
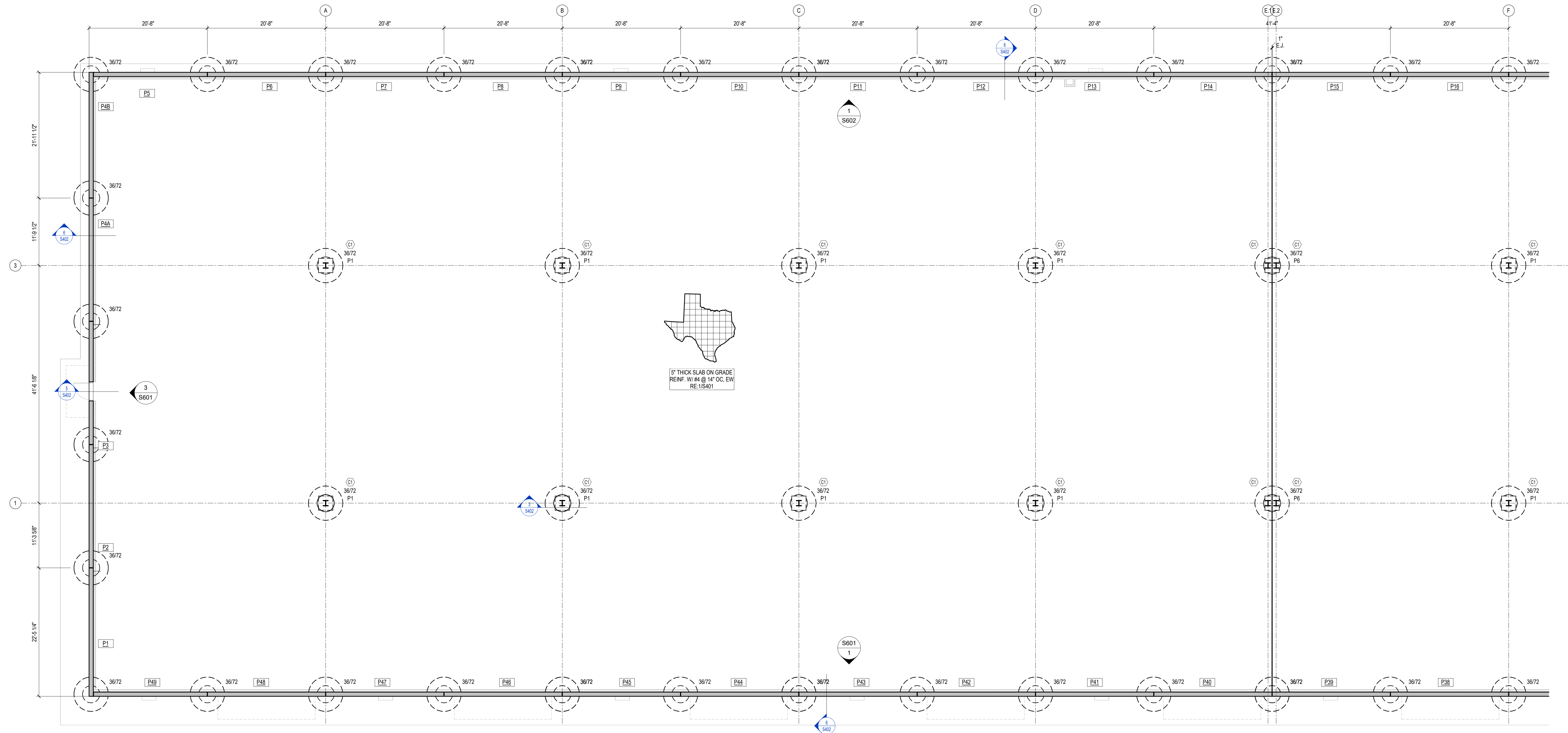
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- FOUNDATION NOTES:**
1. DATUM ELEVATION <math>-0' <math>0''> CORRESPONDS TO TRUE ELEVATION = RE: CIVIL. ALL ELEVATIONS ARE RELATIVE TO DATUM ELEVATION <math>-0' <math>0''>.
  2. "1836" (EXAMPLE) INDICATES DRILLED PIER SHAFT AND BELL SIZE. ALL INTERIOR DRILLED PIERS ARE AT ELEVATION <math>-2' <math>8''> TYP. UON. ALL EXTERIOR DRILLED PIERS ARE AT ELEVATION <math>-2' <math>8''> TYP. UON. ALL INTERMEDIATE PIERS ARE CENTERED BETWEEN GRIDS ON THE GRADE BEAM. TYP. UON. FOR DRILLED PIER SCHEDULE & DETAILS RE: S301.
  3. " (C1) " (EXAMPLE) INDICATES COLUMN SIZE. "BPI1" (EXAMPLE) INDICATES BASE PLATE TYPE. FOR COLUMN, BASE PLATE & ANCHOR BOLT SCHEDULE RE: S302. PROVIDE TYPICAL BLOCKOUTS AT EACH COLUMN PER DETAILS 6, 7, 8 & 9/S401, TYP. UON.
  4. PROVIDE CONTROL JOINTS AT EVERY COLUMN LINE AND AT A MAXIMUM SPACING OF 36 TIMES THE SLAB THICKNESS (NOT TO EXCEED 19'-0"), TYPICAL UON. FOR ADDITIONAL INFORMATION RE: S6401.
  5. PROVIDE ADDITIONAL REINFORCING AT ALL RE-ENTRANT CORNERS PER S/S401.
  6. TYPICAL LIGHT POLE FOUNDATION DETAIL RE: 1/S402.
  7. VERIFY ALL SLOPES, DEPRESSIONS, ELEVATIONS WITH ARCH. PRIOR TO CONSTRUCTION.
  8. COLUMNS OUTSIDE THE BUILDING FOOTPRINT. GO TO COORDINATE WITH CIVIL DRAWINGS TO DETERMINE THE BASEPLATE ELEVATION AS REQUIRED PER THE PAVING/ SIDEWALK SLOPE.
  9. "P1" (EXAMPLE) INDICATES PLINTH TYPE. ALL INTERIOR PLINTHS ARE TYPE "P1" UON. ALL PERIMETER PLINTHS ARE TYPE "P2" UON. ALL CORNER PLINTHS ARE TYPE "P3" UON. T.O. PLINTHS ARE AT <math>-0' <math>0''> TYP. UON. FOR PLINTH SCHEDULE & DETAILS RE: S301.



15" THICK SLAB ON GRADE  
REIN: W #4 @ 14" OC, EW  
RE: 1/S401

**1 FOUNDATION FLOOR PLAN AREA A**  
1/8" = 1'-0"

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**KEY PLAN**  
PLAN NORTH  
TRUE NORTH

**Project No.: 2330**

Drawing Date: 01.17.2024  
Drawn: MR  
Checked: SI  
Scale: AS NOTED

**Issue Log:**

No.	Description	Date
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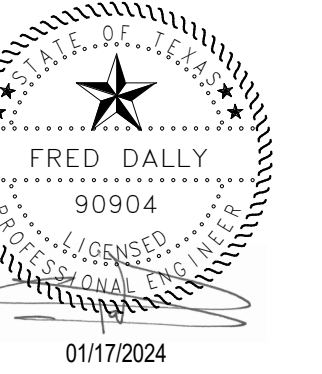
**Revisions:**

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**FOUNDATION FLOOR PLAN AREA A**

**Dally**  
+ ASSOCIATES  
STRUCTURAL | CIVIL  
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t 713.337.8881  
Texas Registered Engineering Firm  
F-003426

**S211**



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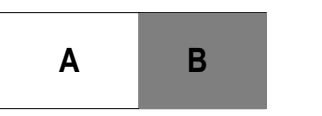
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**KEY PLAN**  
PLAN NORTH  
TRUE NORTH

**Project No.: 2330**

Drawing Date: 01/17/2024  
Drawn: MR  
Checked: SJ  
Scale: AS NOTED

**Issue Log:**

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**Revisions:**

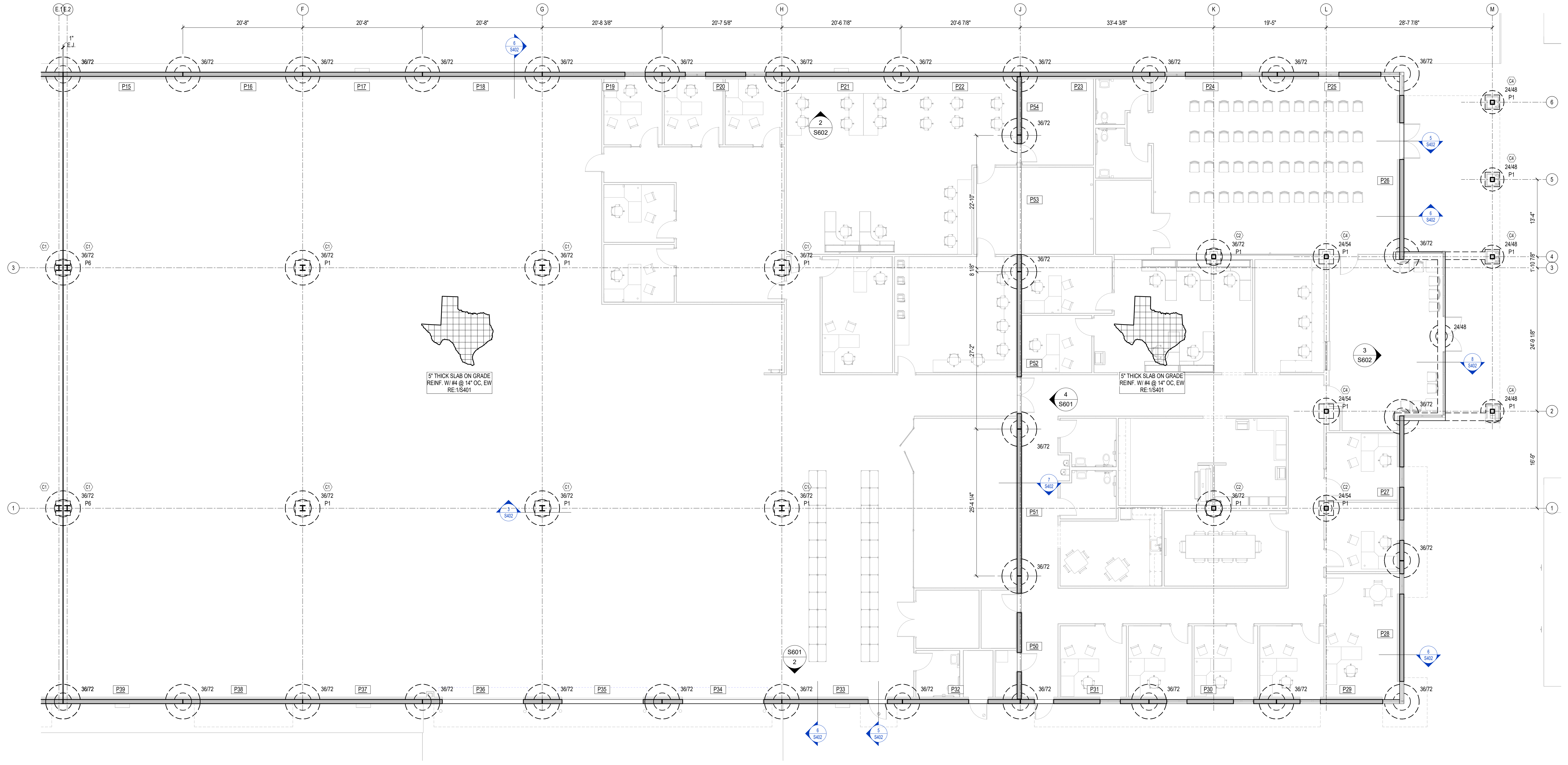
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**FOUNDATION FLOOR PLAN AREA B - ADMIN**



**S212**

- FOUNDATION NOTES:**
- DATUM ELEVATION <'-0'> CORRESPONDS TO TRUE ELEVATION = RE: CIVIL. ALL ELEVATIONS ARE RELATIVE TO DATUM ELEVATION <'-0'>.
  - 18"Ø6" (EXAMPLE) INDICATES DRILLED PIER SHAFT AND BELL SIZE. ALL INTERIOR DRILLED PIERS ARE AT ELEVATION <-2'-6"> TYP. UON. ALL EXTERIOR DRILLED PIERS ARE AT ELEVATION <-2'-6"> TYP. UON. ALL INTERMEDIATE PIERS ARE CENTERED BETWEEN GRIDS ON THE GRADE BEAM. TYP UON FOR DRILLED PIER SCHEDULE & DETAILS RE: S301.
  - Ø (EXAMPLE) INDICATES COLUMN SIZE. 18"Ø1" (EXAMPLE) INDICATES BASE PLATE TYPE. FOR COLUMN BASE PLATE & ANCHOR BOLT SCHEDULE RE: S302. PROVIDE TYPICAL BLOCKOUTS AT EACH COLUMN PER DETAILS 6, 7, & 8 ØS401, TYP UON.
  - PROVIDE CONTROL JOINTS AT EVERY COLUMN LINE AND AT A MAXIMUM SPACING OF 36 TIMES THE SLAB THICKNESS (NOT TO EXCEED 15'-0") TYPICAL UON. FOR ADDITIONAL INFORMATION RE: S3401.
  - PROVIDE ADDITIONAL REINFORCING AT ALL RE-ENTRANT CORNERS PER S5401.
  - TYPICAL LIGHT POLE FOUNDATION DETAIL RE: 1S402
  - VERIFY ALL SLOPES, DEPRESSIONS, ELEVATIONS WITH ARCH. PRIOR TO CONSTRUCTION
  - COLUMNS OUTSIDE THE BUILDING FOOTPRINT, GC TO COORDINATE WITH CIVIL DRAWINGS TO DETERMINE THE BASEPLATE ELEVATION AS REQUIRED PER THE PAVING/ SIDEWALK SLOPE.
  - Ø1" (EXAMPLE) INDICATES PLINTH TYPE. ALL INTERIOR PLINTHS ARE TYPE "P1" UON. ALL PERIMETER PLINTHS ARE TYPE "P2" UON. ALL CORNER PLINTHS ARE TYPE "P3" UON. T.O. PLINTHS ARE AT <-0'-0"> TYP. UON. FOR PLINTH SCHEDULE & DETAILS RE: S301.



**1 FOUNDATION FLOOR PLAN AREA B - ADMIN**  
1/8" = 1'-0"

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PROVIDE AN ALLOWANCE FOR ADDITIONAL 15 TONS OF MISCELLANEOUS STEEL FOR THE ENTIRE PROJECT (SIZES AS DIRECTED BY THE ARCHITECT) FOR TO BE USED IN THE FIELD AS DIRECTED BY THE ARCHITECT FOR AND SHALL INCLUDE ALL THE ASSOCIATED DETAILING, LABOR, ERECTION, AND ANY OVERHEAD COST. ANY UNUSED PORTION OF THE QUANTITY SHALL BE CREDITED TO THE OWNER AT THE SAME RATE.

- STEEL ROOF FRAMING NOTES:**
1. ALL ELEVATIONS ARE RELATIVE TO DATUM ELEVATION.
  2. " DECK " (EXAMPLE INDICATES ROOF DECK SPAN TYPE 1 DIRECTION AND DECK TYPE 2. TOS ELEVATION AT ROOF DECKS ARE AT 800. TYP. UON. FOR DECK TYPE INFORMATION RE: 7 (S901)
  3. COORDINATE LOCATIONS AND SIZES OF ALL CHASES AND PENETRATIONS WITH MEP. COORDINATE EXACT LOCATION OF ALL MEP UNITS WITH MEP. FOR FRAMING AROUND ROOF OPENINGS RE: 7 (S905)
  4. FOR BRACE ELEVATIONS AND DETAILS RE: S901
  5. TILT-WALL ELEVATIONS RE: S903, S904 & S905
  6. PROVIDE KCS JOISTS BELOW RTU. KCS JOISTS TO MATCH SAME K-SIZE JOISTS OR LARGER IF SMALLER SIZE IS NOT APPLICABLE. GC TO COORDINATE WITH MEP DRAWINGS FOR EXACT LOCATIONS. WHERE LH JOIST SUPPORTING RTU UNITS, JOISTS MANUFACTURE TO DESIGN THE LH JOIST WITH 250 LB/FT ADDITIONAL LOAD.
  7. BEAMS ADJACENT TO LONG SPAN JOISTS TO BE CAMBERED MATCHING JOISTS CAMBER.
  8. L3X3X1/4 BRACING @ 8'-0" OC TO BE PROVIDED AT THE LONG SPAN FROM BEAMS BOTTOM FLANGE TO ADJACENT JOIST TOP CHORD.
  9. WHERE K-JOISTS AND LH JOIST BEAR ON SAME BEAM K-JOIST SEAT TO MATCH LH JOISTS SEAT.
  10. DP DENOTES TO DOUBLE PITCHED JOISTS
  11. ALL EXTERIOR EXPOSED STEEL TO BE HOT DIPPED GALVANIZED. BEAMS SUBJECT TO MOMENT CONNECTIONS AND RUNNING PARALLEL TO FLOOR BEAMS, PROVIDE L3 X 3 X 1/4 KICKERS AT 5'-0" O.C. FROM BEAM BOTTOM FLANGES TO ADJACENT BEAM TOP FLANGES.



Quality. Creativity. Sustainability. Resource Management.  
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 1206 Nance Street Houston, TX 77002 Tel.: 832.409.3050  
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**KEY PLAN**  
 PLAN NORTH  
 TRUE NORTH

Project No.: 2330

Drawing Date: 01/17/2024  
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 Checked: SJ  
 Scale: AS NOTED

**Issue Log:**

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**Revisions:**

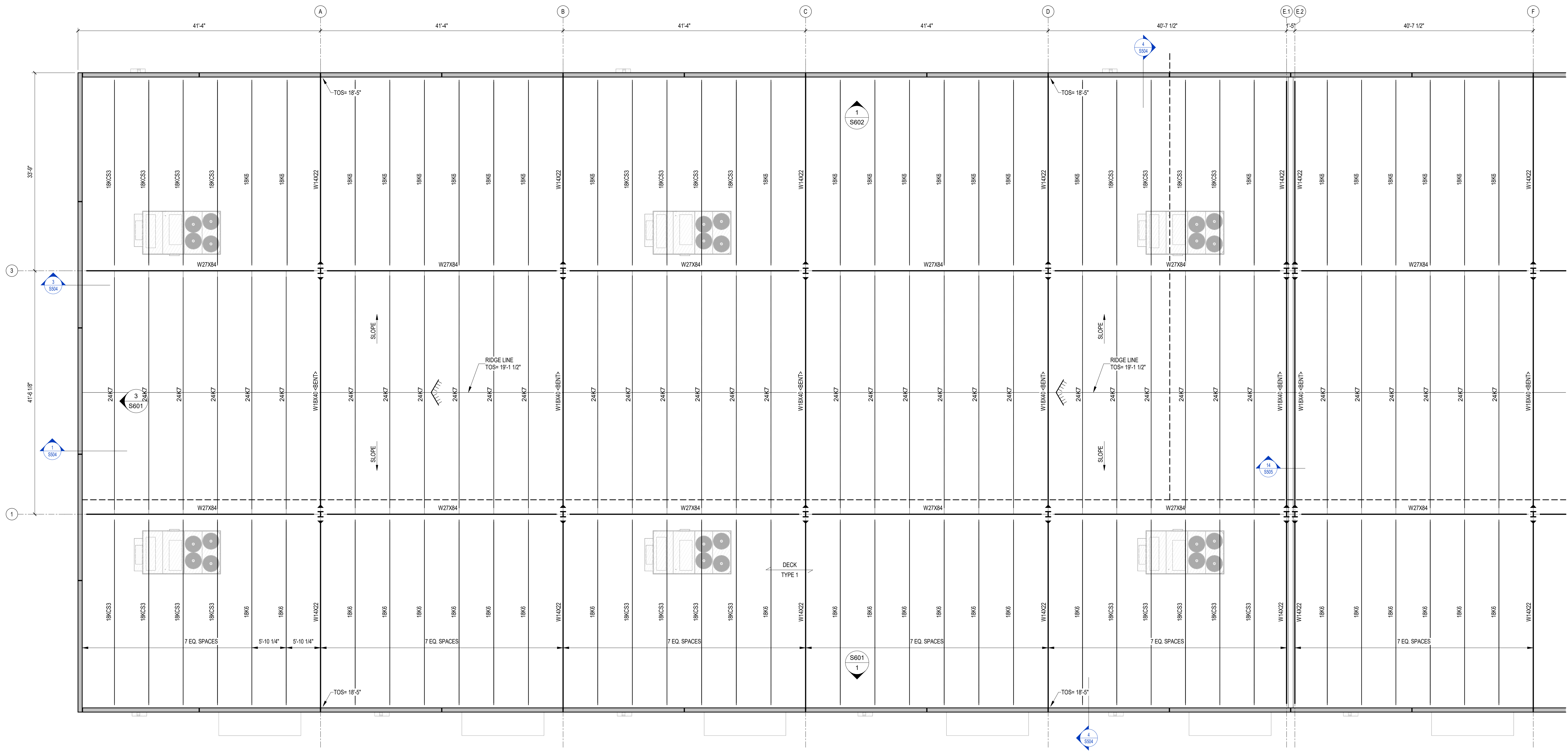
No.	Description	Date

**FRAMING PLAN  
 AREA A**



8900 Richmond Avenue, Suite 460  
 Houston, Texas 77042  
 1713 337 8881  
 Texas Registered Engineering Firm  
 F-003426

**S221**



**1 ROOF FRAMING PLAN - AREA A**  
 1/8" = 1'-0"

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**KEY PLAN**  
PLAN NORTH  
TRUE NORTH

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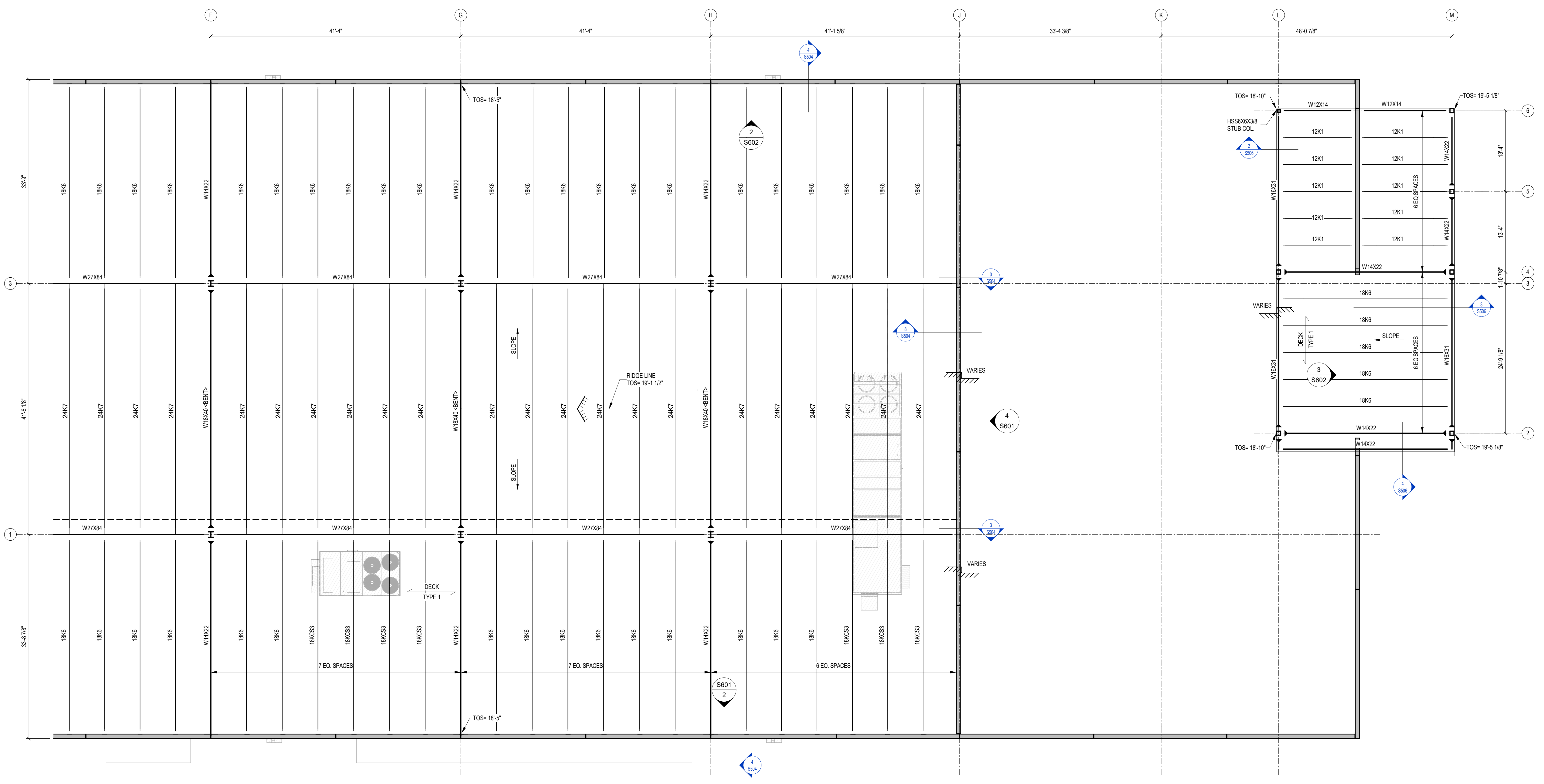
**HI ROOF FRAMING  
PLAN AREA B -  
ADMIN**

**S223**

PROVIDE AN ALLOWANCE FOR ADDITIONAL 15 TONS OF MISCELLANEOUS STEEL FOR THE ENTIRE PROJECT (SIZES AS DIRECTED BY THE ARCHITECT) FOR TO BE USED IN THE FIELD AS DIRECTED BY THE ARCHITECT. FOR AND SHALL INCLUDE ALL THE ASSOCIATED DETAILING, LABOR, ERECTION, AND ANY OVERHEAD COST. ANY UNUSED PORTION OF THE QUANTITY SHALL BE CREDITED TO THE OWNER AT THE SAME RATE.

**STEEL ROOF FRAMING NOTES:**

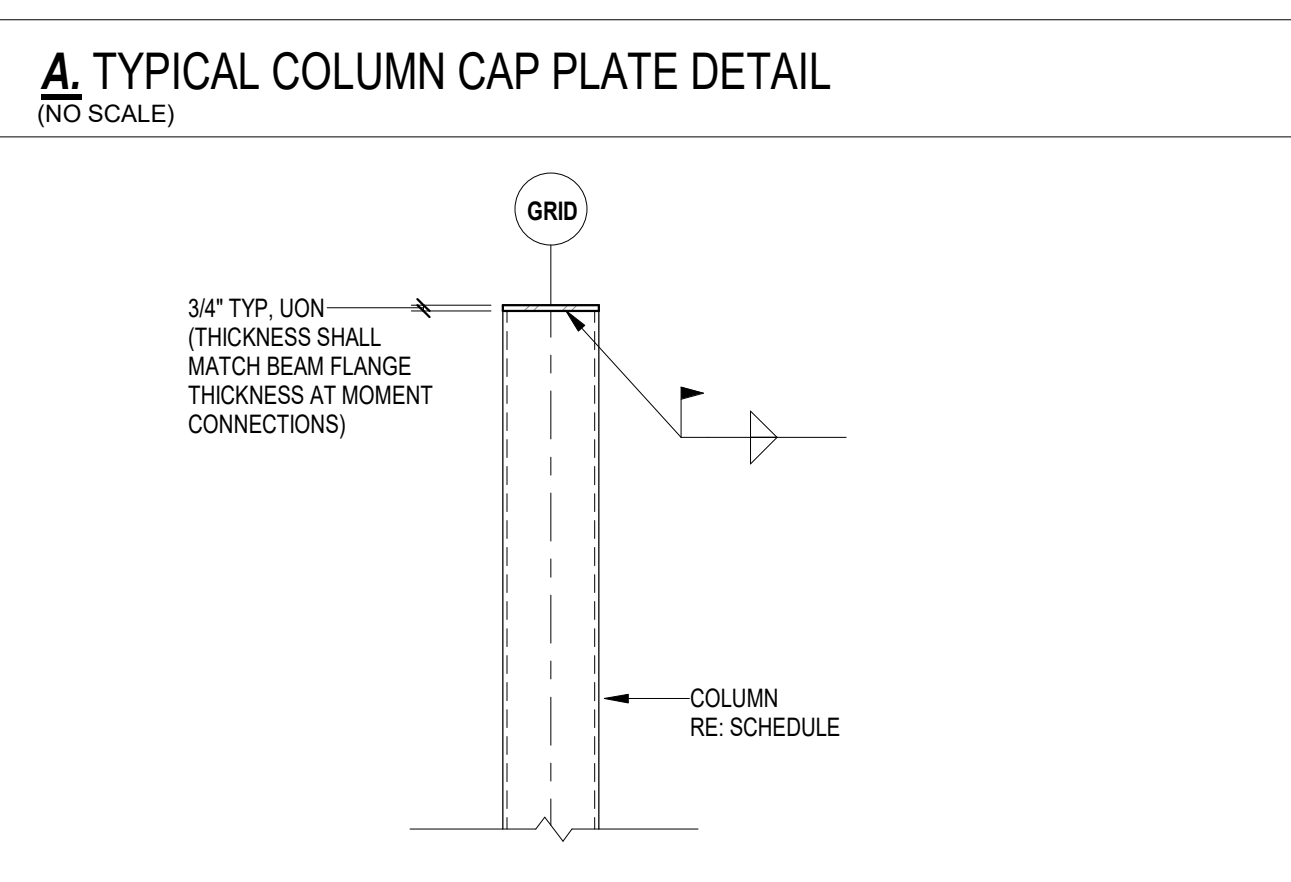
- ALL ELEVATIONS ARE RELATIVE TO DATUM ELEVATION.
- DECK TYPE 1 (EXAMPLE) INDICATES ROOF DECK SPAN DIRECTION AND DECK TYPE 2. TOS ELEVATION AT ROOF DECKS ARE AT BOD. TYP. UON. FOR DECK TYPE INFORMATION **RE: 7/15/01**
- COORDINATE LOCATIONS AND SIZES OF ALL CHASES AND PENETRATIONS WITH MEP. COORDINATE EXACT LOCATION OF ALL MEP UNITS WITH MEP. FOR FRAMING AROUND ROOF OPENINGS **RE: 7/15/01**
- FOR BRACE ELEVATIONS AND DETAILS **RE: S601**
- TILT-WALL ELEVATIONS **RE: S601, S604 & S605**
- PROVIDE KCS JOISTS BELOW RTU. KCS JOISTS TO MATCH SAME K-SIZE JOISTS OR LARGER IF SMALLER SIZE IS NOT APPLICABLE. GC TO COORDINATE WITH MEP DRAWINGS FOR EXACT LOCATIONS. WHERE LH JOISTS SUPPORTING RTU UNITS, JOISTS MANUFACTURE TO DESIGN THE LH JOIST WITH 250 LB/FT ADDITIONAL LOAD.
- BEAMS ADJACENT TO LONG SPAN JOISTS TO BE CAMBERED MATCHING JOISTS CAMBER.
- L3X3X1/4" BRACING @ 6" O.C. TO BE PROVIDED AT THE LONG SPAN FROM BEAMS BOTTOM FLANGE TO ADJACENT JOIST TOP CHORD.
- WHERE K JOISTS AND LH JOIST BEAR ON SAME BEAM K-JOIST SEAT TO MATCH LH JOISTS SEAT.
- DP DENOTES TO DOUBLE PITCHED JOISTS
- ALL EXTERIOR EXPOSED STEEL TO BE HOT DIPPED GALVANIZED. BEAMS SUBJECT TO MOMENT CONNECTIONS AND RUNNING PARALLEL TO FLOOR BEAMS. PROVIDE L3 X 3 X 1/4" KICKERS AT 5'-0" O.C. FROM BEAM BOTTOM FLANGES TO ADJACENT BEAM TOP FLANGES.



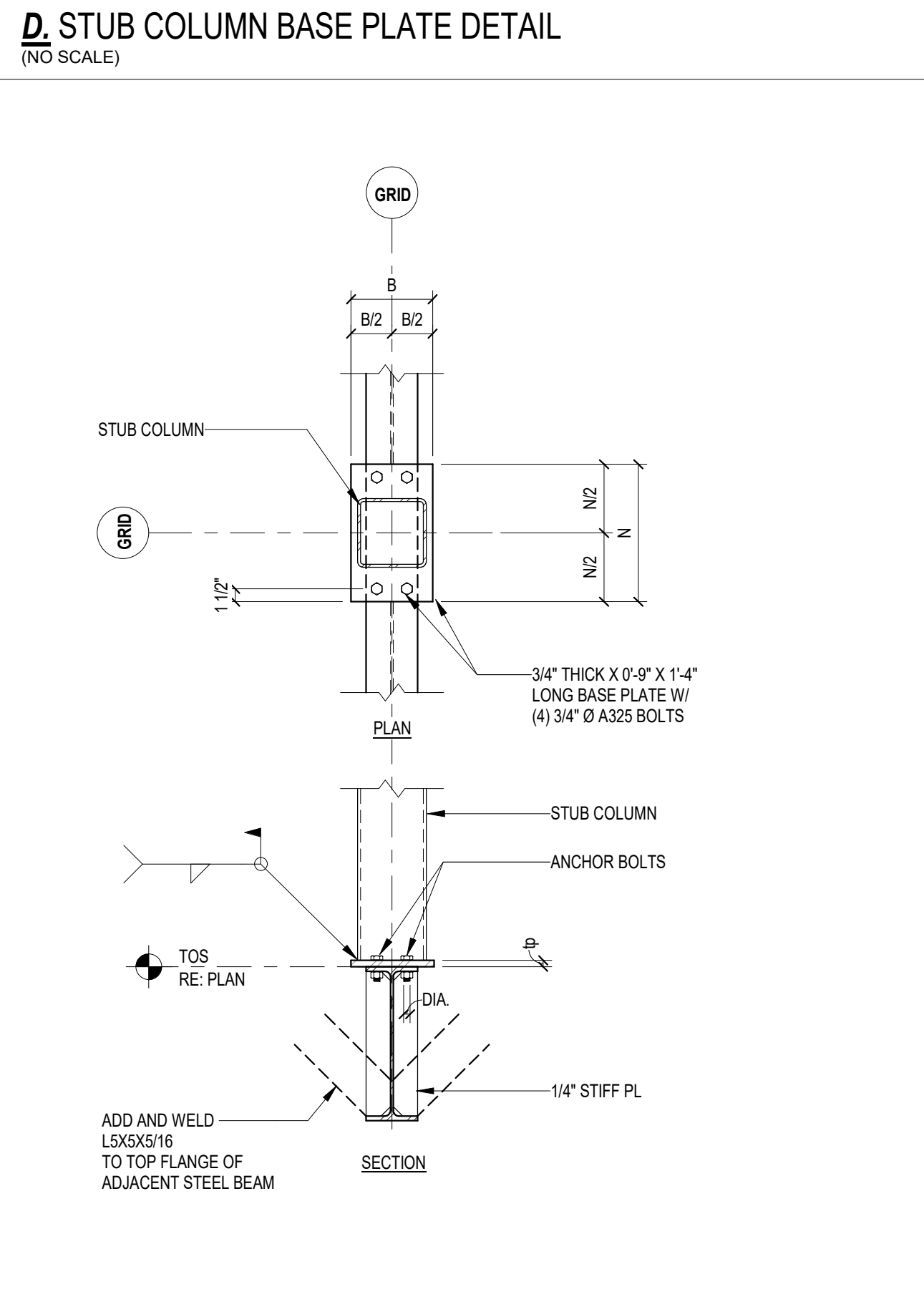
**1 ENLARGED FRAMING PLAN - AREA B ADMIN**  
1/8" = 1'-0"

# 1. STRUCTURAL STEEL COLUMN SCHEDULE AND DETAILS

LEVEL	COLUMN MARK	C1	C2	C3																
CAP PLATE DETAIL																				
<p>HI ROOF AT ENTRANCE BOD ELEVATION = EL +XX'-0" (F.V.)</p> <p>ROOF = +XX'-0" (F.V.) TOC ELEVATION = RE: PLAN</p> <p>LO ROOF AREA B - ADMIN = +XX'-0" (F.V.) TOC ELEVATION = RE: PLAN</p> <p>DATUM F.F. EL. 0'-0" = RE: G.C. (F.V.) 0'-0"</p>																				
<p>W10X79</p> <p>HSS8X8X1/2</p> <p>HSS10X10X1/2</p>																				
<p>BOTTOM OF BASE PLATE EL. -6'10"</p> <p>BASE PLATE MARK BP3 BP2 BP3</p> <p>REMARKS</p>																				



- ### B. COLUMN GENERAL NOTES
1. PROVIDE STRUCTURAL STEEL FOR W SHAPES CONFORMING TO ASTM 962, GRADE 50.
  2. PROVIDE STRUCTURAL STEEL FOR HSS COLUMNS CONFORMING TO ASTM A500, GRADE B.
  3. PROVIDE STEEL FOR STIFFENER PLATES, CONNECTION PLATES AND ANGLES CONFORMING TO ASTM A36.
  4. SAW OR MILL SURFACES NOTED FIN. (FINISHED) FOR TRUE AND FULL CONTACT.
  5. USE E70XX WELDING ELECTRODES FOR ALL WELDS, UNLESS OTHERWISE NOTED.
  6. PROVIDE WEB DOUBLER PLATES IF REQUIRED TO SATISFY DESIGN DEMANDS.
- ### C. COLUMN REMARKS



- ### E. BASE PLATE GENERAL NOTES
1. PROVIDE STEEL FOR BASE PLATES CONFORMING TO GRADE 50.
  2. PROVIDE HOLES IN BASE PLATES IN ACCORDANCE WITH AISC 14TH EDITION.
  3. PROVIDE ANCHOR RODS CONFORMING TO ASTM F1554, GRADE 55 WELDABLE.
  4. PROVIDE ANCHOR RODS WITH PLATE WASHERS AND HEX NUTS.
  5. USE E70XX WELDING ELECTRODES FOR ALL WELDS, UNLESS OTHERWISE NOTED.
  6. MILL SURFACES NOTED FIN. (FINISHED) FOR TRUE AND FULL CONTACT.
  7. SET ANCHOR RODS WITH TEMPLATE.
  8. PROVIDE NON-METALLIC SHRINK-RESISTANT GROUT WITH 8000 PSI MINIMUM COMPRESSIVE STRENGTH AT 28-DAYS.

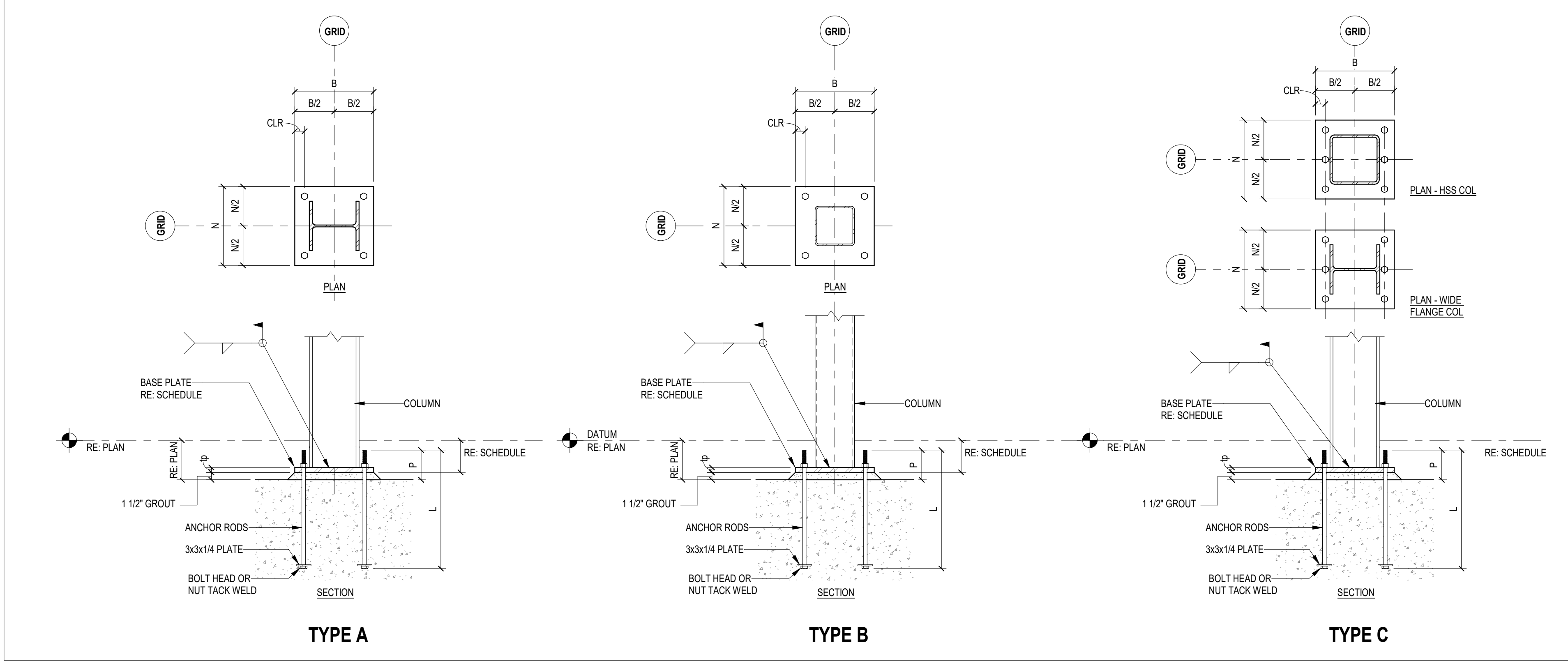
# 2. BASE PLATE SCHEDULE AND DETAILS

MARK	PLATE TYPE	DIMENSIONS			ANCHOR RODS				WELD SIZE	REMARKS
		B (IN)	N (IN)	lp (IN)	NUMBER	DIA (IN)	PROJECTION P (IN)	LENGTH L (IN)	W (IN)	
BP1	B	16	16	1-1/4"	4	1"	6	2'-2"	5/16	
BP2	B	14	14	1-1/4"	6	1"	6	2'-2"	5/16	
BP3	B	18	18	1-1/4"	4	1 1/4"	6	2'-2"	5/16	

TYPICAL ANCHOR ROD CLEARANCE SCHEDULE

ROD Ø	CLEAR DIM
1"	2"
1-1/4"	2-1/4"
1-1/2"	2-1/2"

NOTED AS 'CLR' ON BASEPLATE DETAILS



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No.	Description	Date

STEEL COLUMN SCHEDULE & DETAILS



## DRILLED SHAFT PIER SCHEDULE

SHAFT DIAMETER	VERTICAL REINFORCING		TIES		REMARKS
	NUMBER	SIZE	SIZE	SPACING (IN)	
18	6	#5	#4	12	
24	6	#6	#4	12	
30	6	#8	#4	12	
36	8	#8	#4	12	

## DRILLED SHAFT PIER GENERAL NOTES

1. A GEOTECHNICAL REPORT IS AVAILABLE FOR REVIEW
2. THE INDEPENDENT TESTING LABORATORY SHALL CONFIRM THE ALLOWABLE SOIL BEARING CAPACITY IN THE FIELD AT THE ELEVATION DESIGNATED AS THE PLANE OF BEARING FOR THE DRILLED PIER.
  - a. ALLOWABLE BEARING PRESSURE OF 3500 PSF
3. THE INDEPENDENT TESTING LABORATORY SHALL INSPECT THE BOTTOM AND SIDES OF THE DRILLED PIER PRIOR TO PLACING REINFORCING AND CONCRETE.
4. CENTER ALL DRILLED PIERS UNDER THEIR COLUMNS, UON.
5. MAINTAIN CLOSE AND ACCURATE DRILLING PRACTICES TO ACHIEVE CLOSE TOLERANCES WITH THE REINFORCING STEEL AND THE ANCHOR ROD TEMPLATE.
6. ALL REINFORCING STEEL FOR DRILLED PIERS SHALL BE DEFORMED NEW BILLET STEEL CONFORMING TO ASTM A615, GRADE 60.
7. ALL SCHEDULED REINFORCEMENT SHALL BE UNIFORMLY DISTRIBUTED.
8. DEPOSIT CONCRETE TO ITS FINAL POSITION BY THE USE OF A TREMIE.
9. CONSOLIDATE CONCRETE IN ITS FINAL POSITION BY VIBRATING.

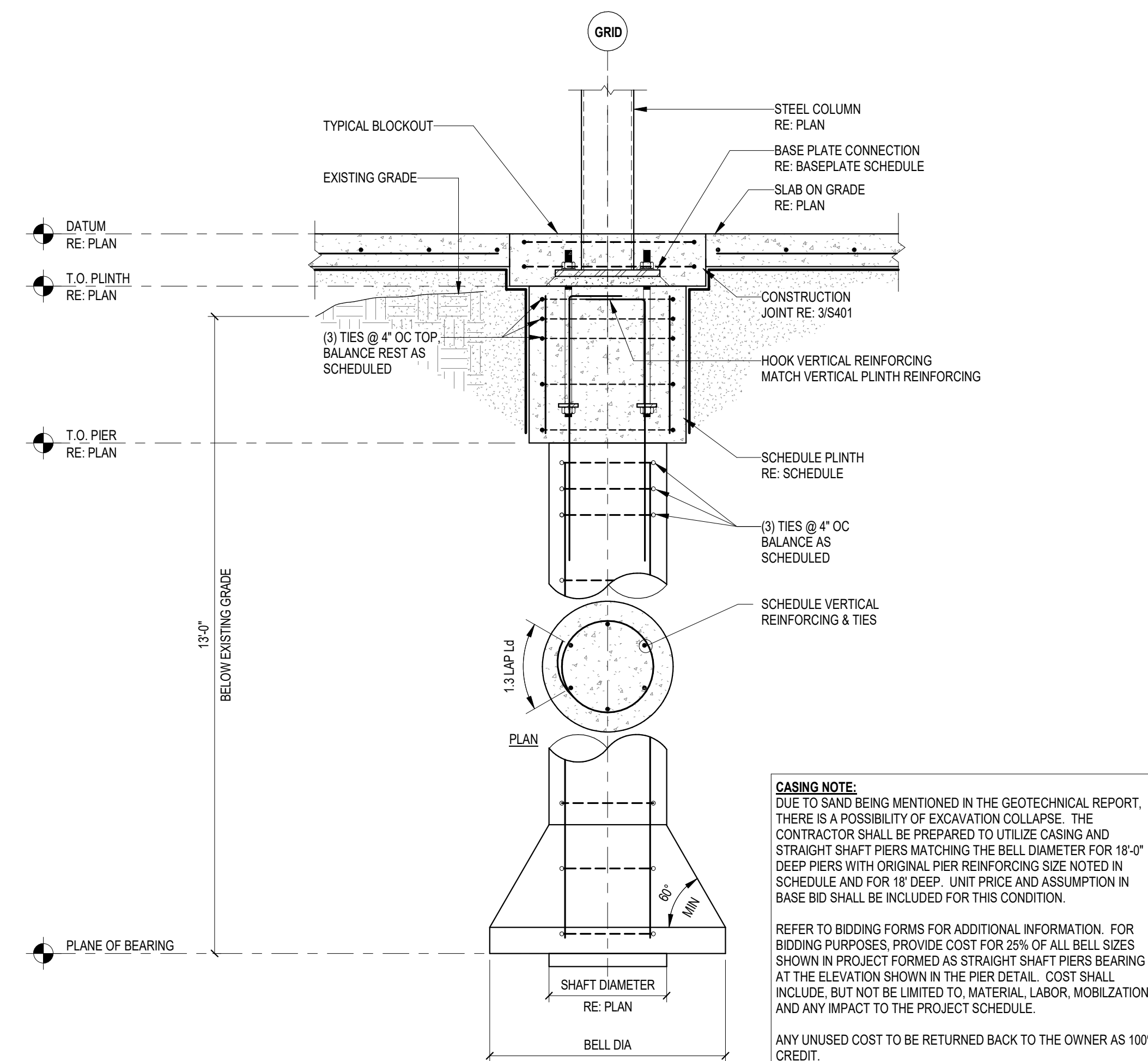
## 2. PLINTH SCHEDULE

MARK	PLINTH TYPE	REINFORCING		REMARKS
		VERTICAL	TIES	
P1, P1A	TYPE 1	(12) #7	#4 @ 10" O.C.	
P2, P2A	TYPE 2	(12) #7	#4 @ 10" O.C.	
P3, P3A, P3B, P3C, P3D	TYPE 3	(12) #8	#4 @ 10" O.C.	

## 2B. PLINTH GENERAL NOTES

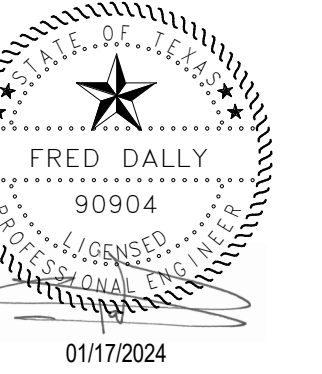
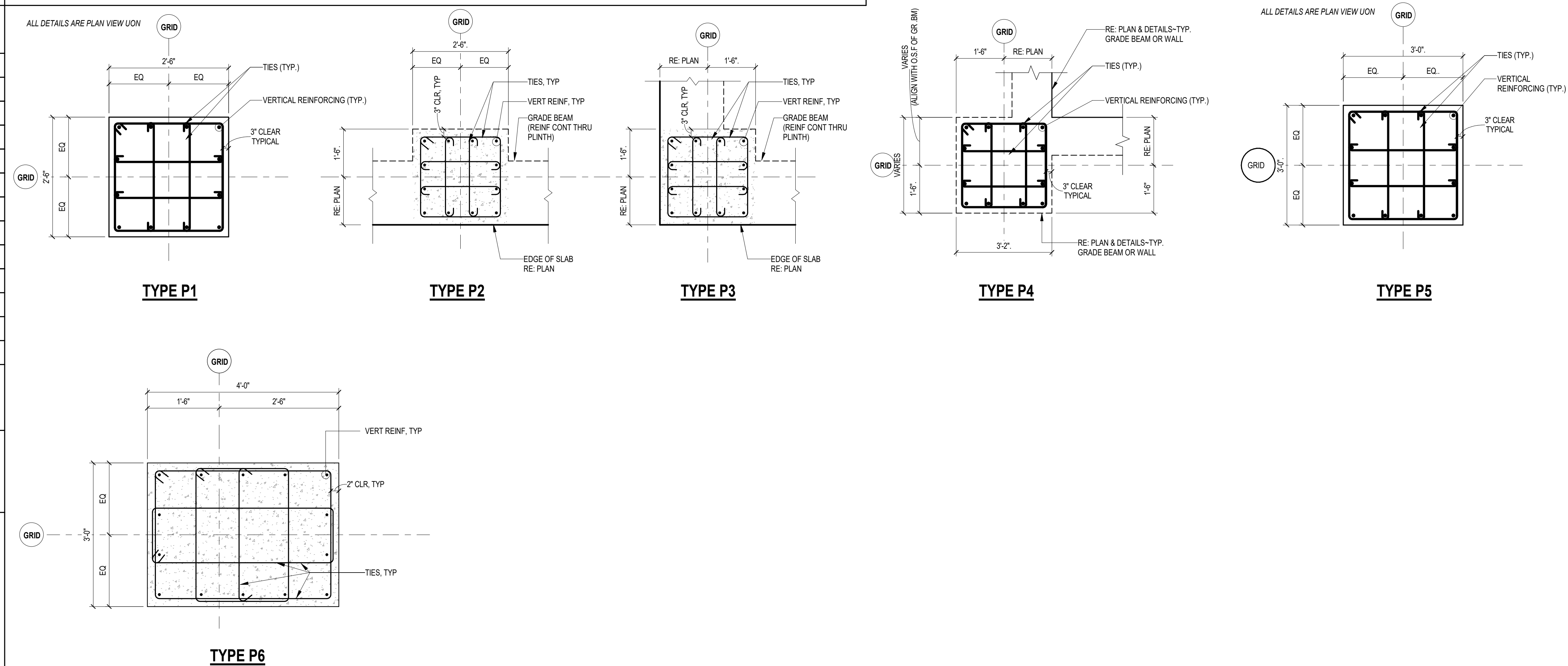
1. RE: PLAN FOR TYPE AND ORIENTATION OF PLINTHS.
2. WHERE A PLINTH IS INTEGRAL WITH A BEAM, EXTEND THE HORIZONTAL REINFORCING THROUGH THE PLINTH.

## DRILLED SHAFT PIER DETAILS



## 2A. PLINTH DETAILS CONT.

## 2A. PLINTH DETAILS



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Revisions:

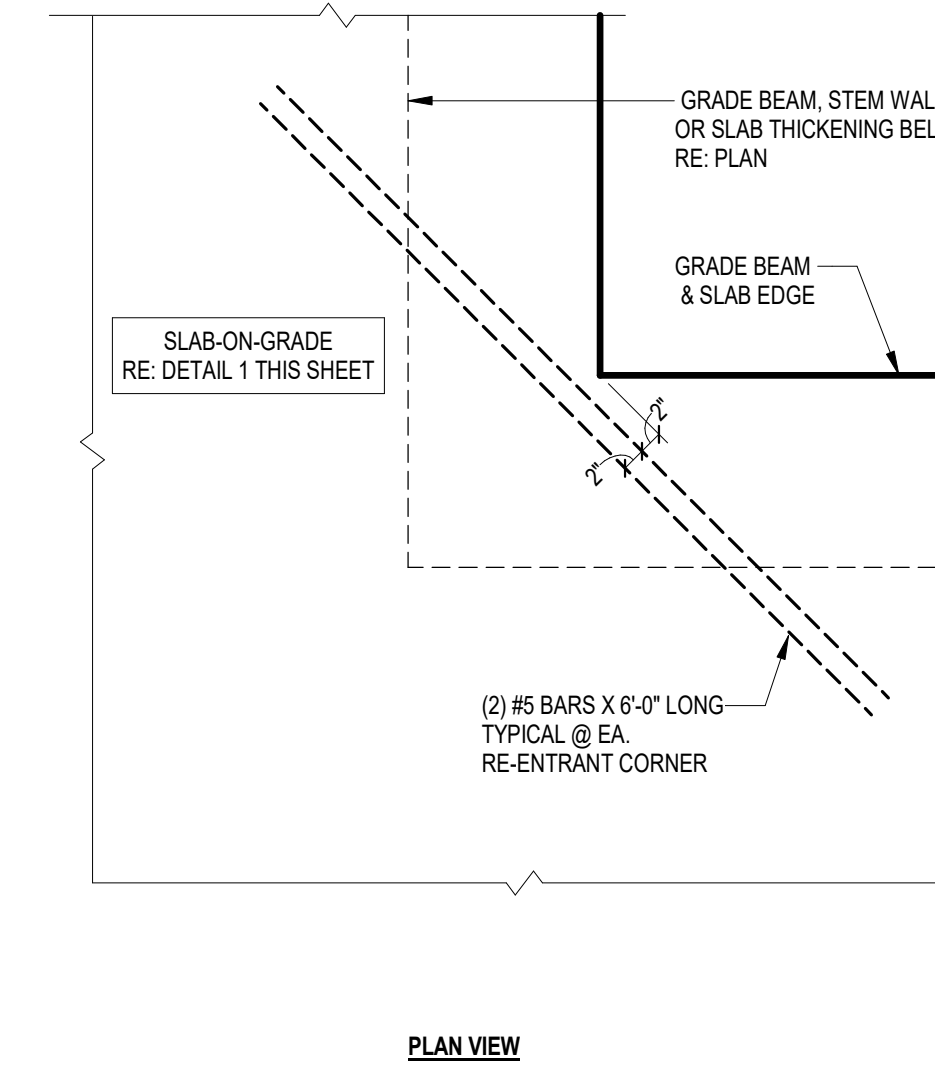
No.	Description	Date

TYPICAL  
FOUNDATION  
DETAILS

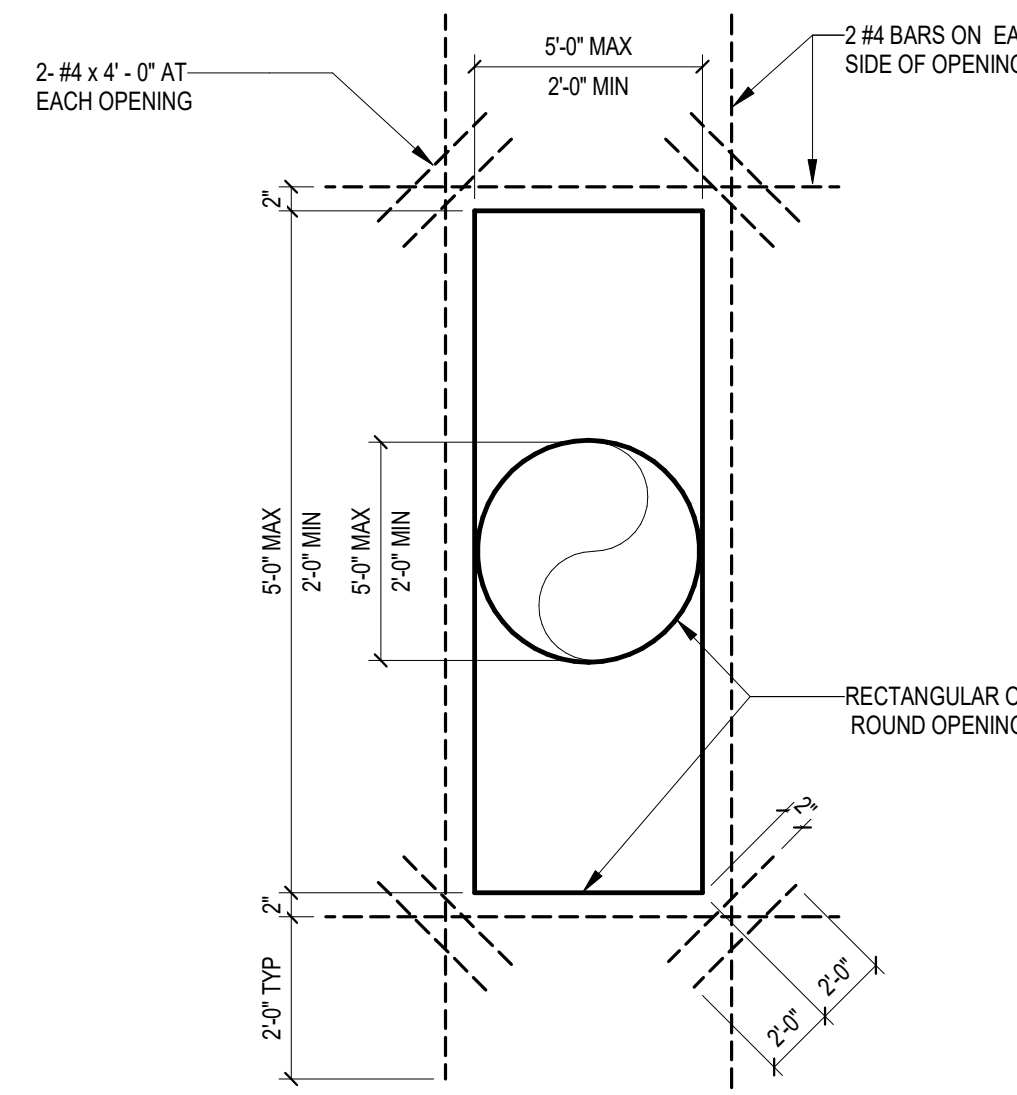
S401

**Dally**  
+ ASSOCIATES  
STRUCTURAL CIVIL

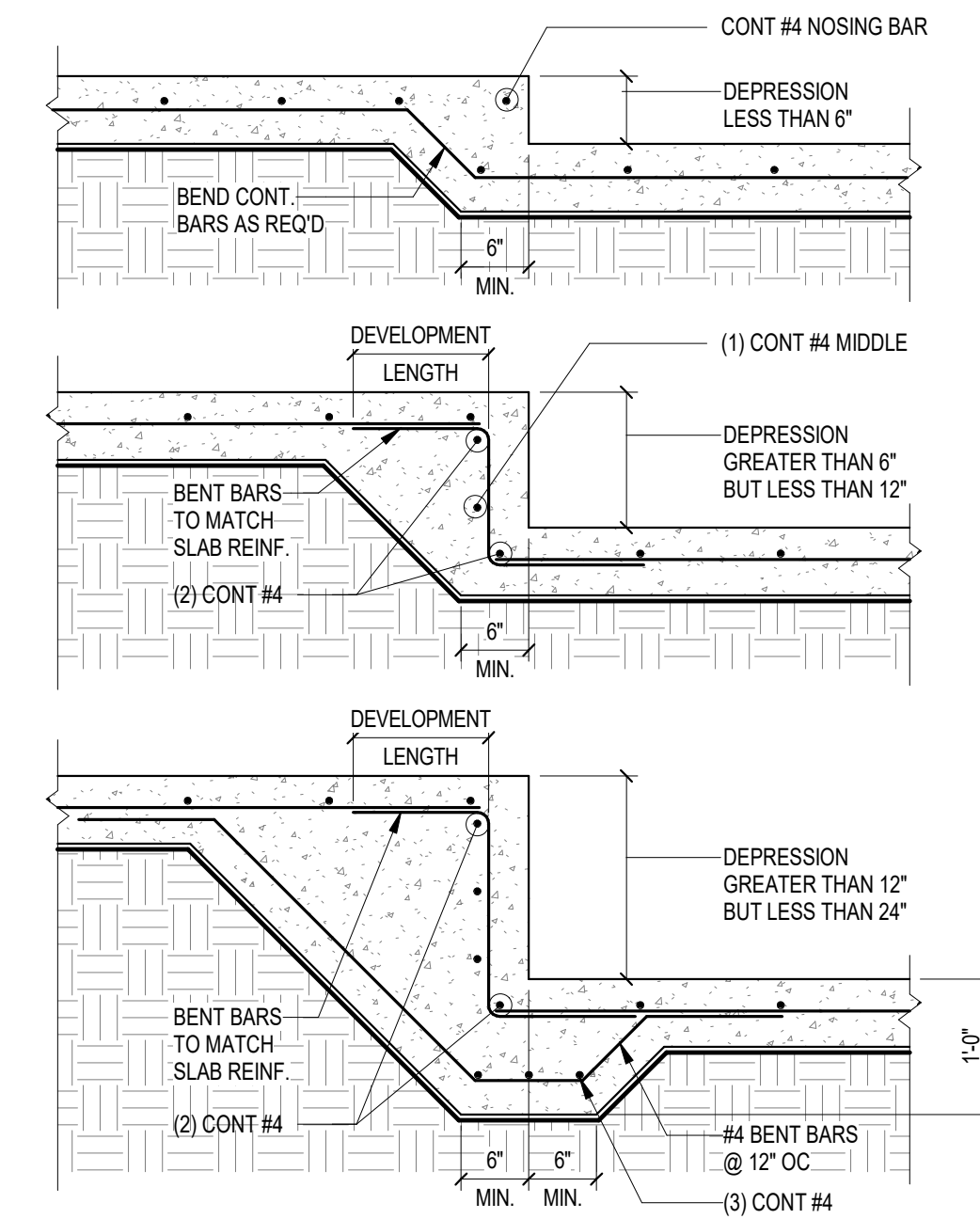
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Houston, Texas 77042  
1713 337 8881  
Texas Registered Engineering Firm  
F-003426



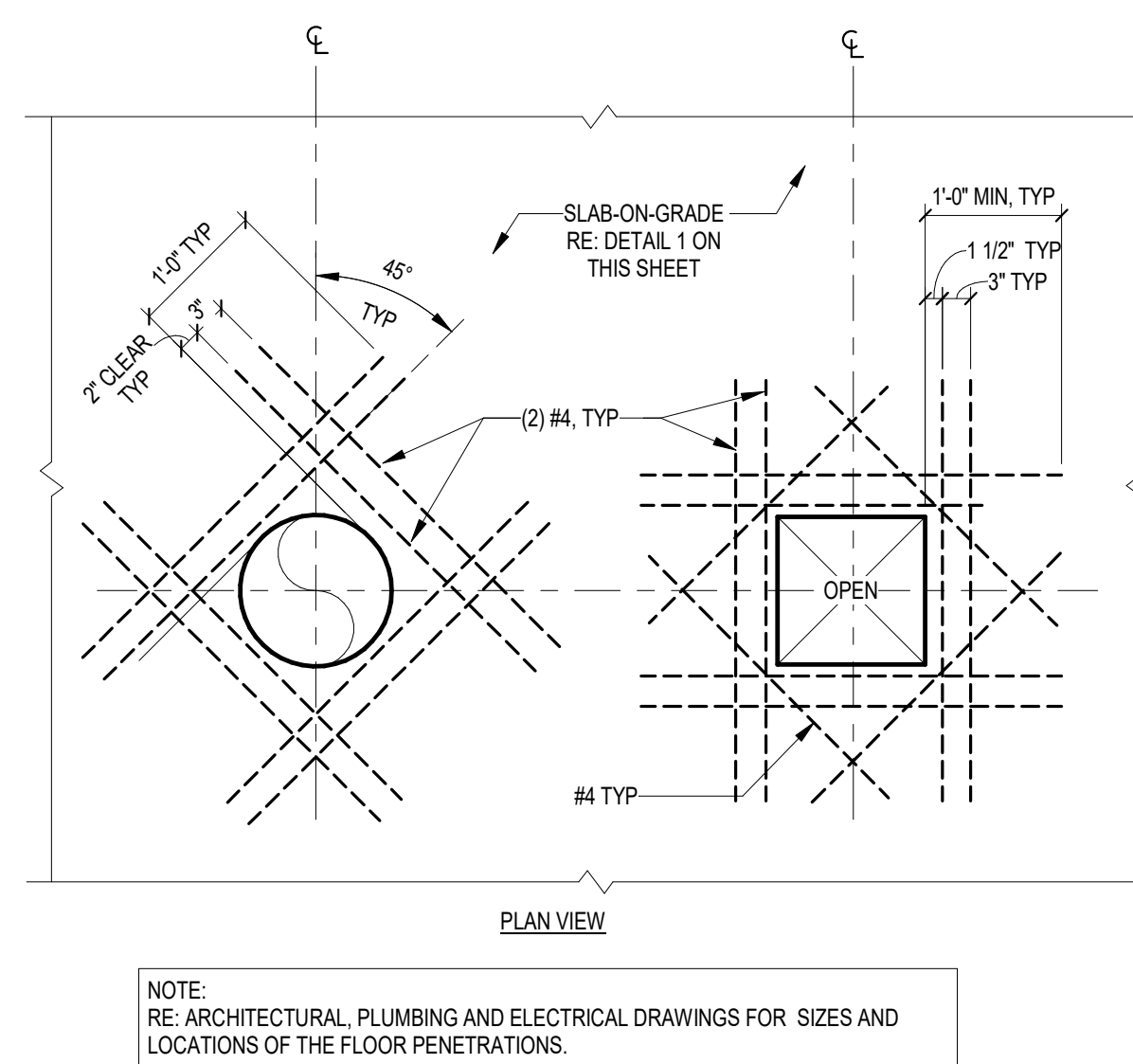
5 TYPICAL RE-ENTRANT CORNER REINF.  
3/4" = 1'-0"



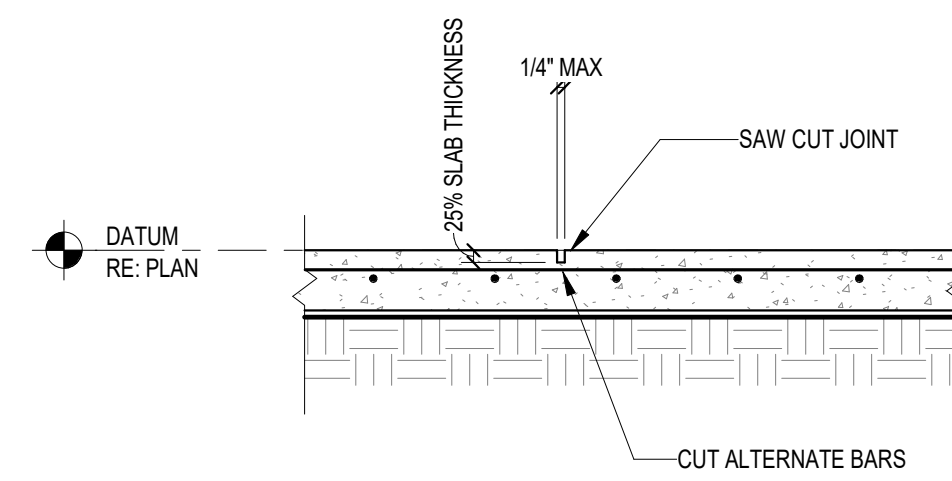
10 SLAB REINF. AT OPENING 5'-0" OR LESS  
3/4" = 1'-0"



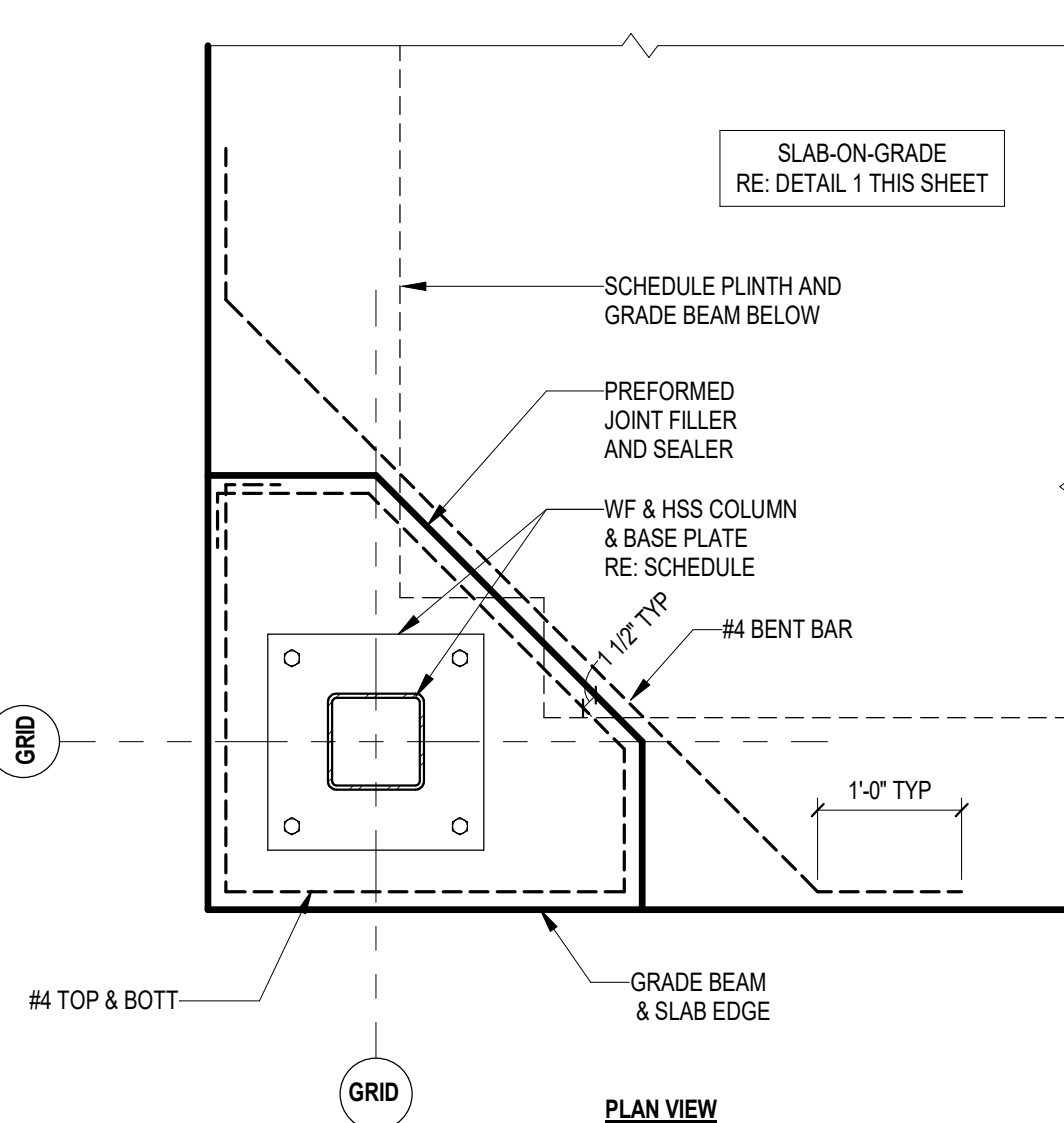
4 TYPICAL SLAB DEPRESSION DETAILS  
3/4" = 1'-0"



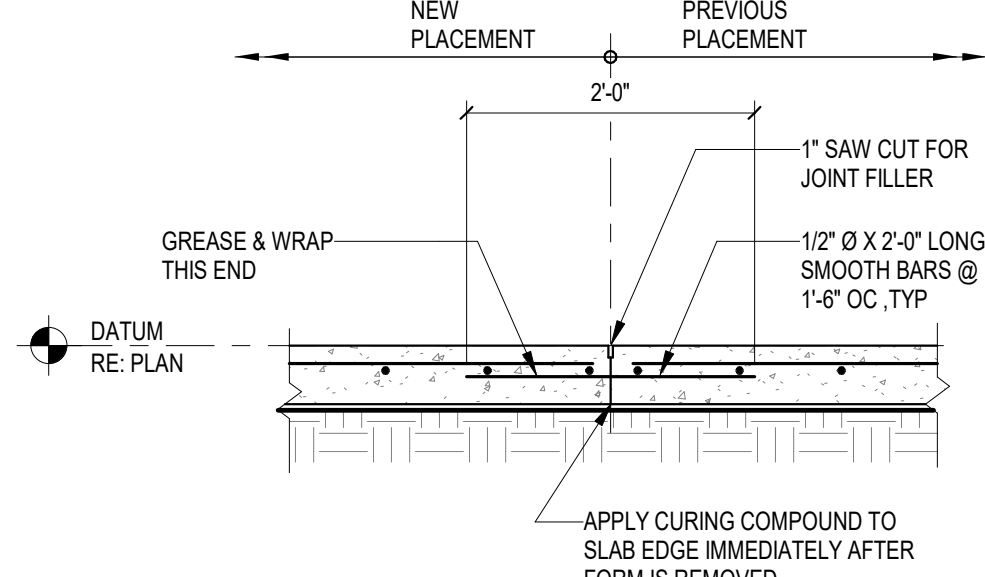
9 SLAB REINF. AT OPENING 2'-0" OR LESS  
3/4" = 1'-0"



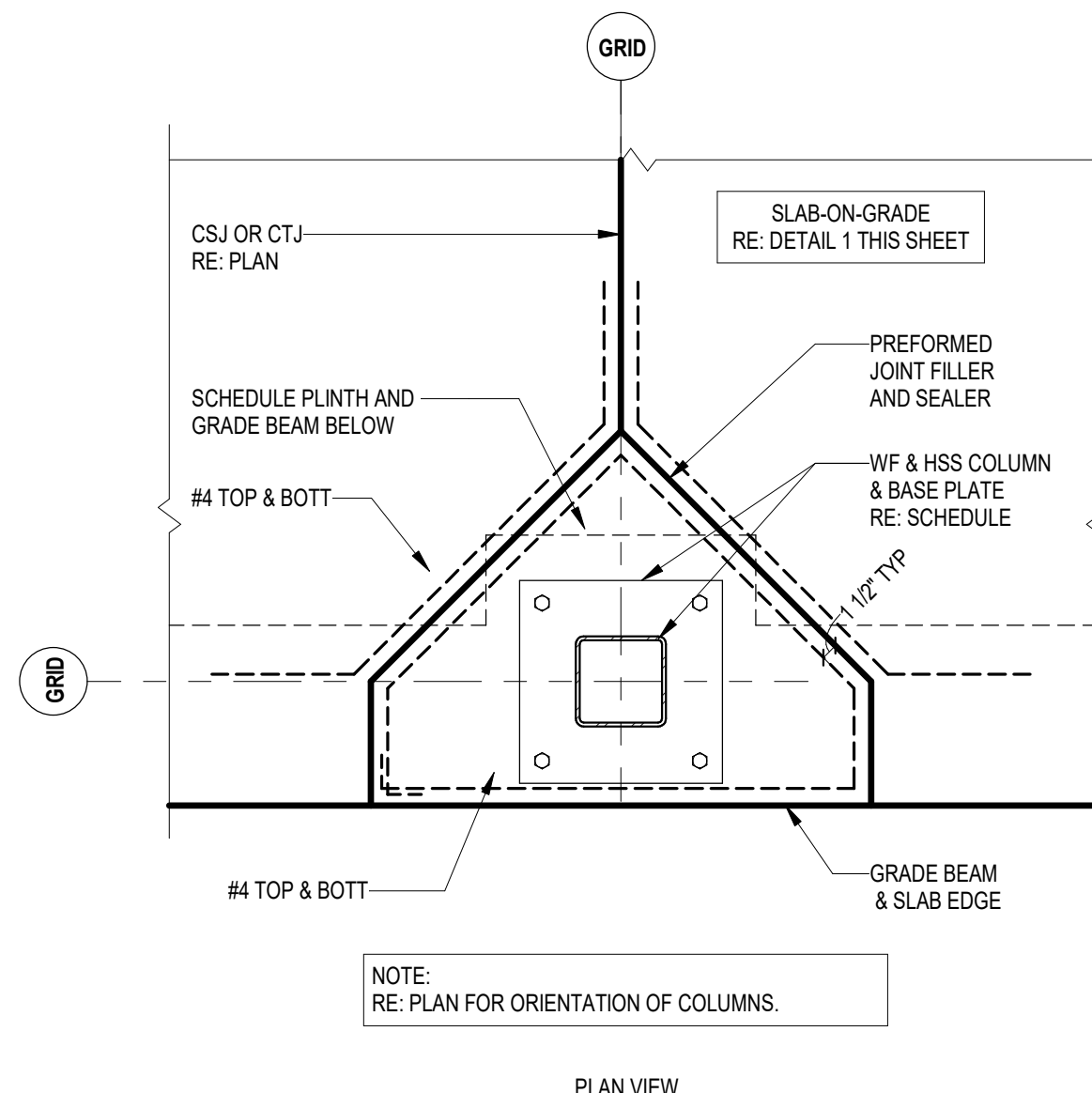
3 TYPICAL SECTION - CONTROL JOINT  
3/4" = 1'-0"



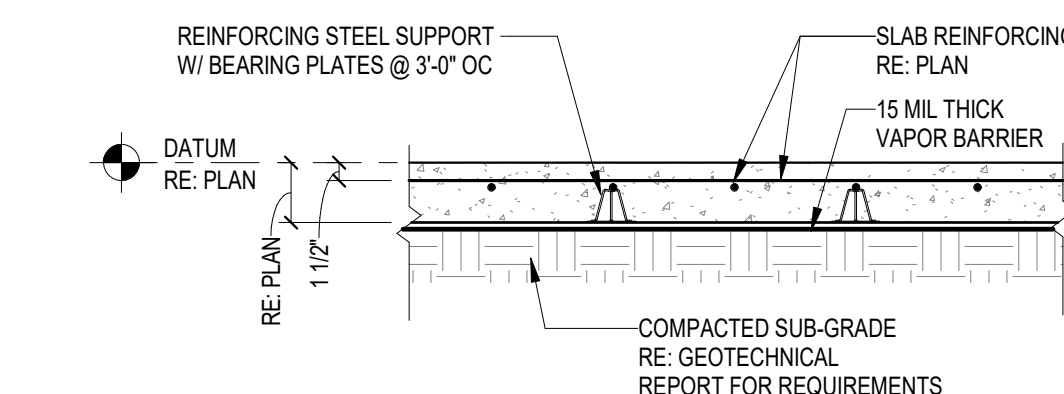
8 EXTERIOR CORNER COLUMN BLOCKOUT  
3/4" = 1'-0"



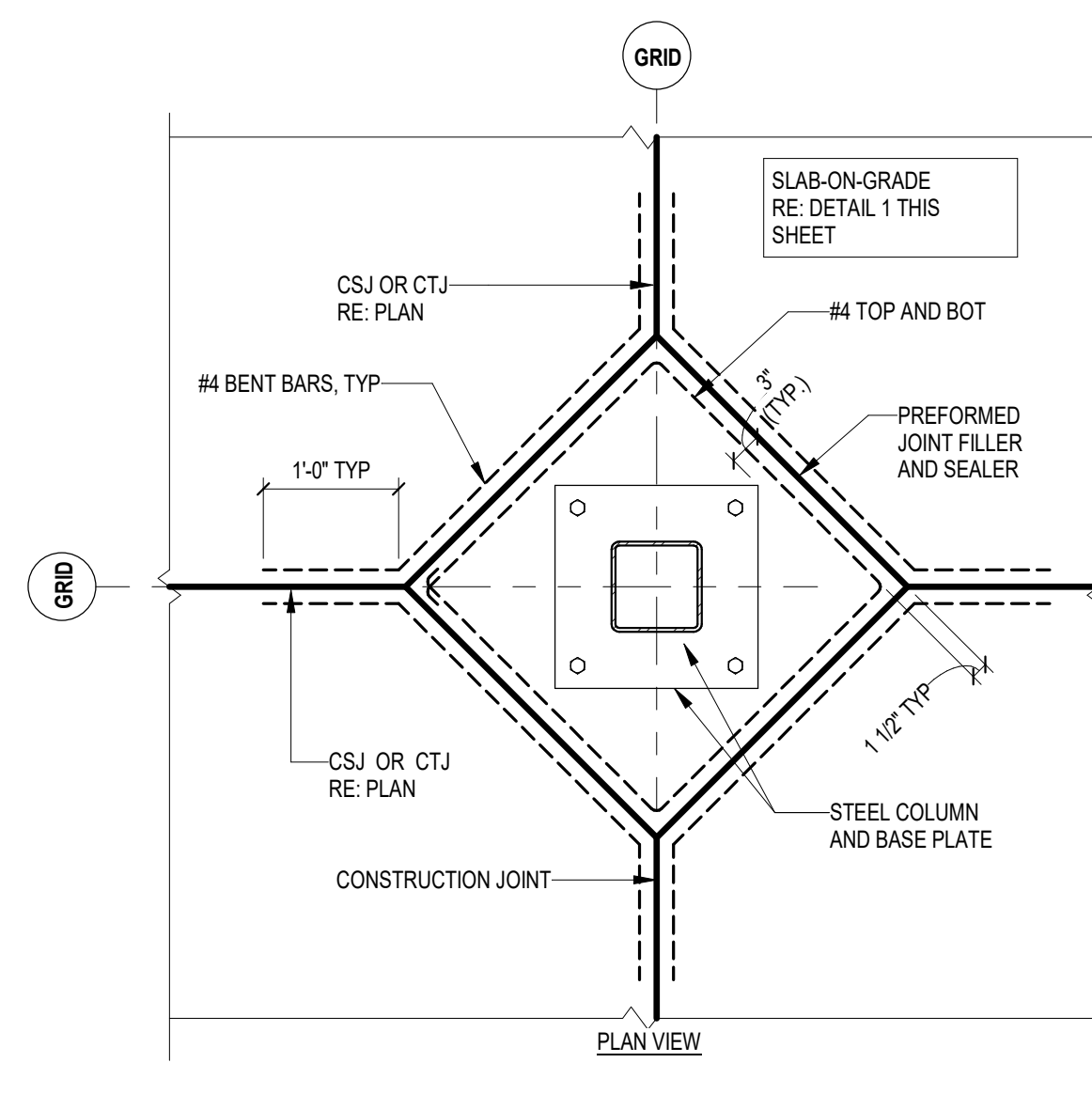
2 TYPICAL SECTION - CONSTRUCTION JOINT  
3/4" = 1'-0"



7 PERIMETER COLUMN BLOCKOUT  
3/4" = 1'-0"



1 TYPICAL SLAB SECTION  
3/4" = 1'-0"

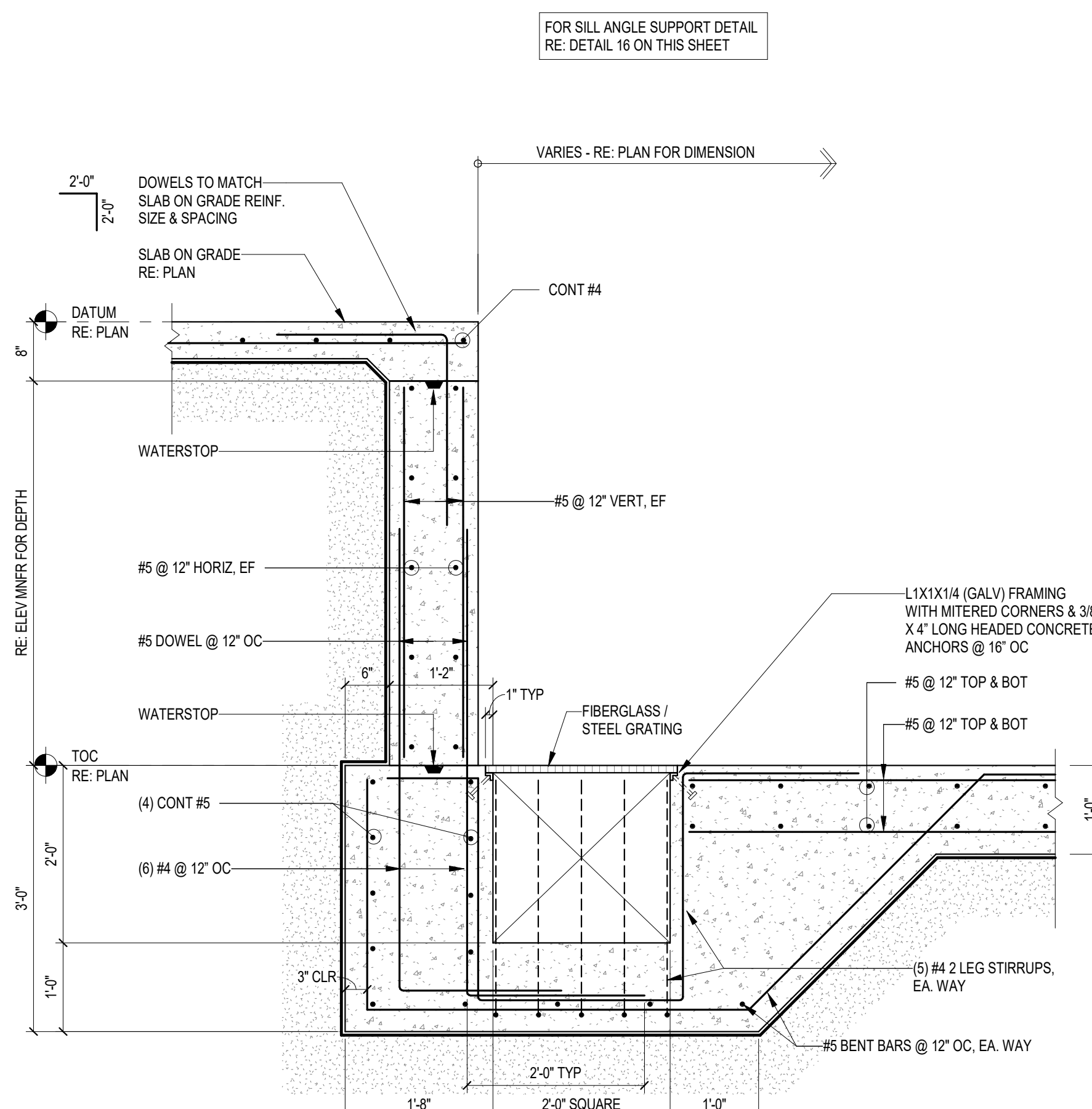


6 INTERIOR COLUMN BLOCKOUT  
3/4" = 1'-0"

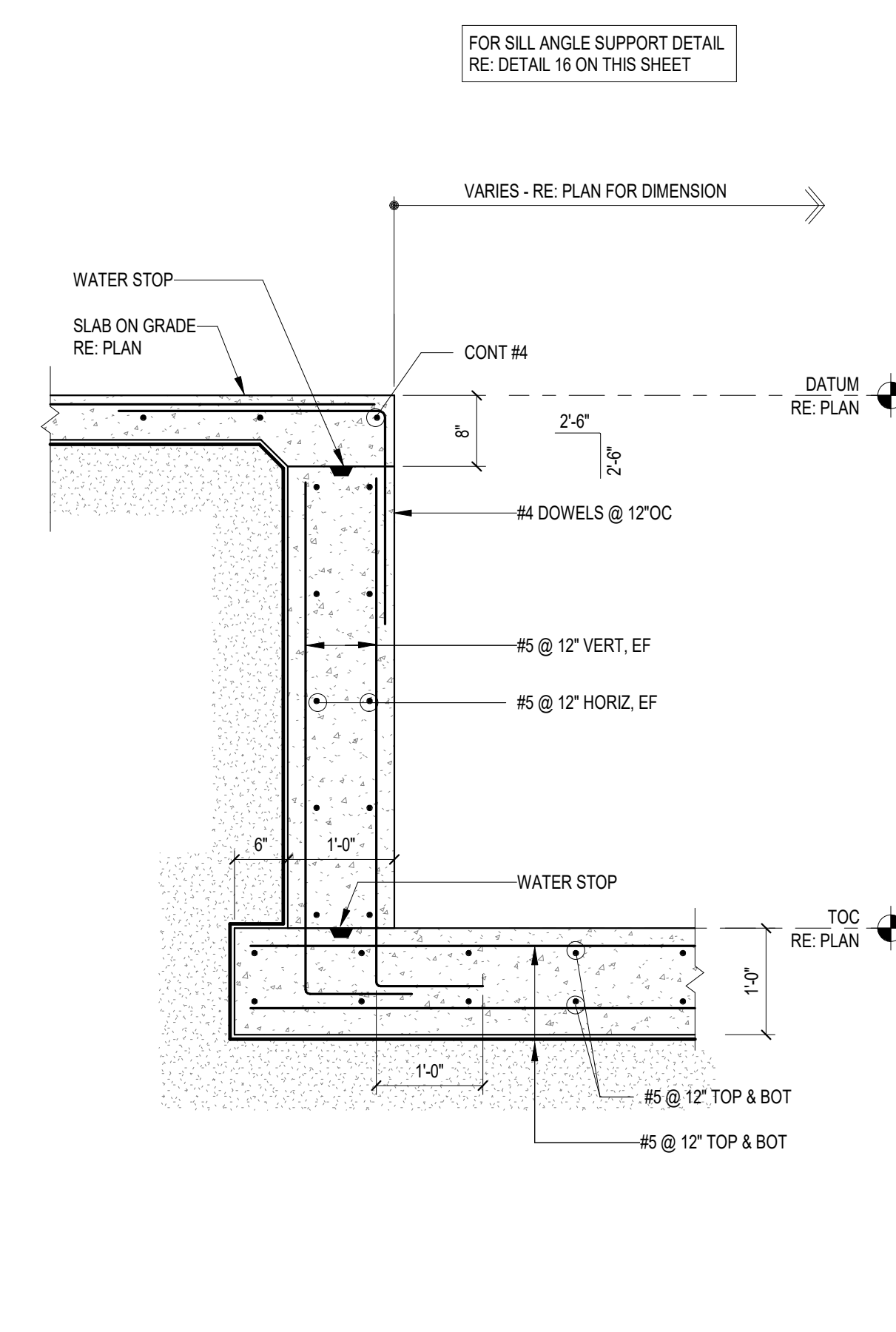
ROUGHEN SURFACE AND ADD BONDING AGENT TO EXIST SURFACE PRIOR TO HOUSEKEEPING PAD POUR

NOTE:  
GENERAL CONTRACTOR TO COORDINATE WITH MECHANICAL DRAWINGS AND SPECIFICATIONS TO DETERMINE REQUIREMENTS FOR HOUSEKEEPING PADS OVER SLAB ON GRADE AND PROVIDE WHERE REQUIRED WHETHER SHOWN ON STRUCTURAL DRAWINGS OR NOT. COORDINATE DIMENSIONS AND OTHER SPECIAL REQUIREMENTS WITH EQUIPMENT MANUFACTURERS AS REQUIRED.

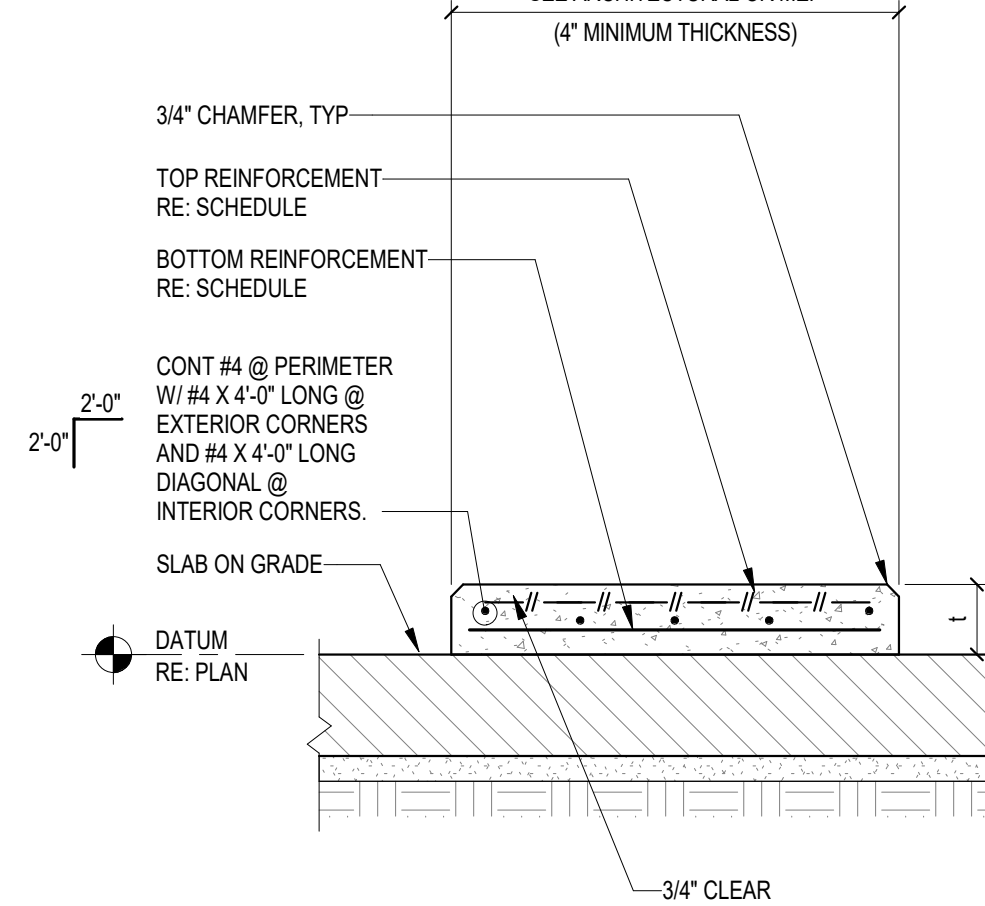
PAD THICKNESS	TOP REINFORCEMENT	BOTTOM REINFORCEMENT
1' <= 4'	6" x 6" W2.9 x W2.9	NONE
4' < t <= 6'	4" x 4" W4.0 x W4.0	NONE
6' < t <= 8'	4" x 4" W5.5 x W5.5	NONE
8' < t <= 12'	#4 @ 12" EW	#3 @ 18" EW
12' < t <= 16'	#4 @ 12" EW	#4 @ 12" EW



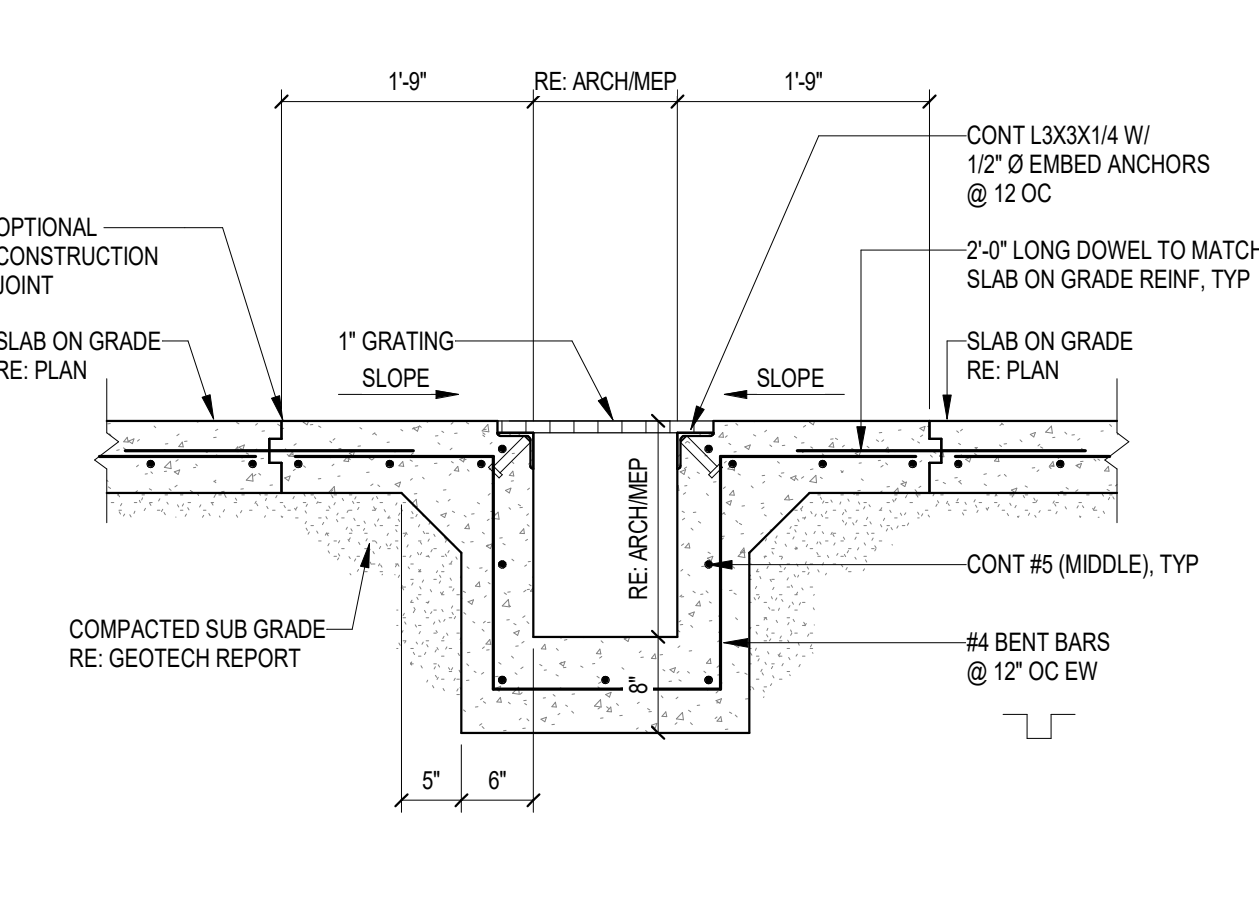
13 SUMP PIT DETAIL  
3/4" = 1'-0"



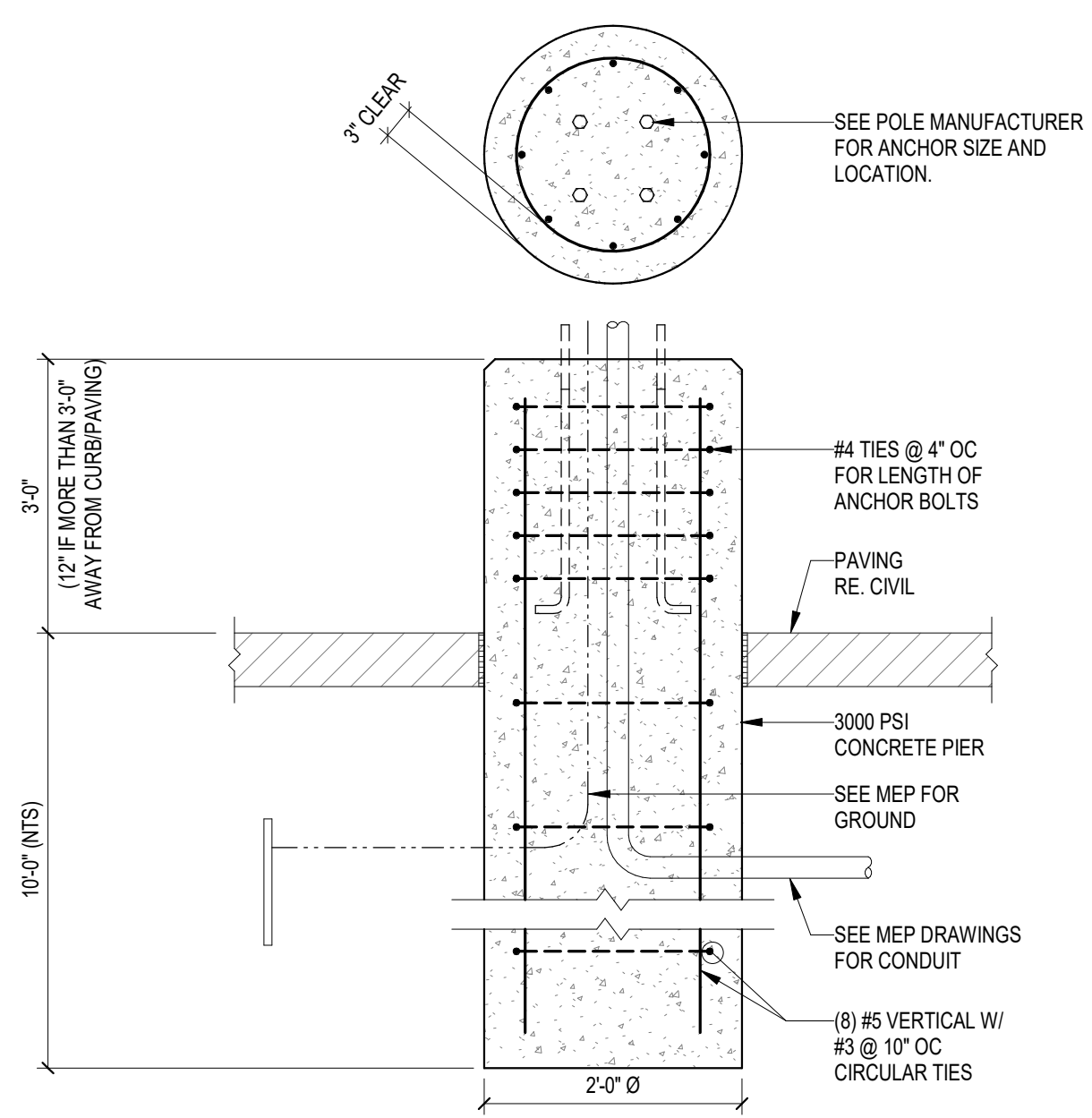
14 ELEVATOR PIT WALL DETAIL  
3/4" = 1'-0"



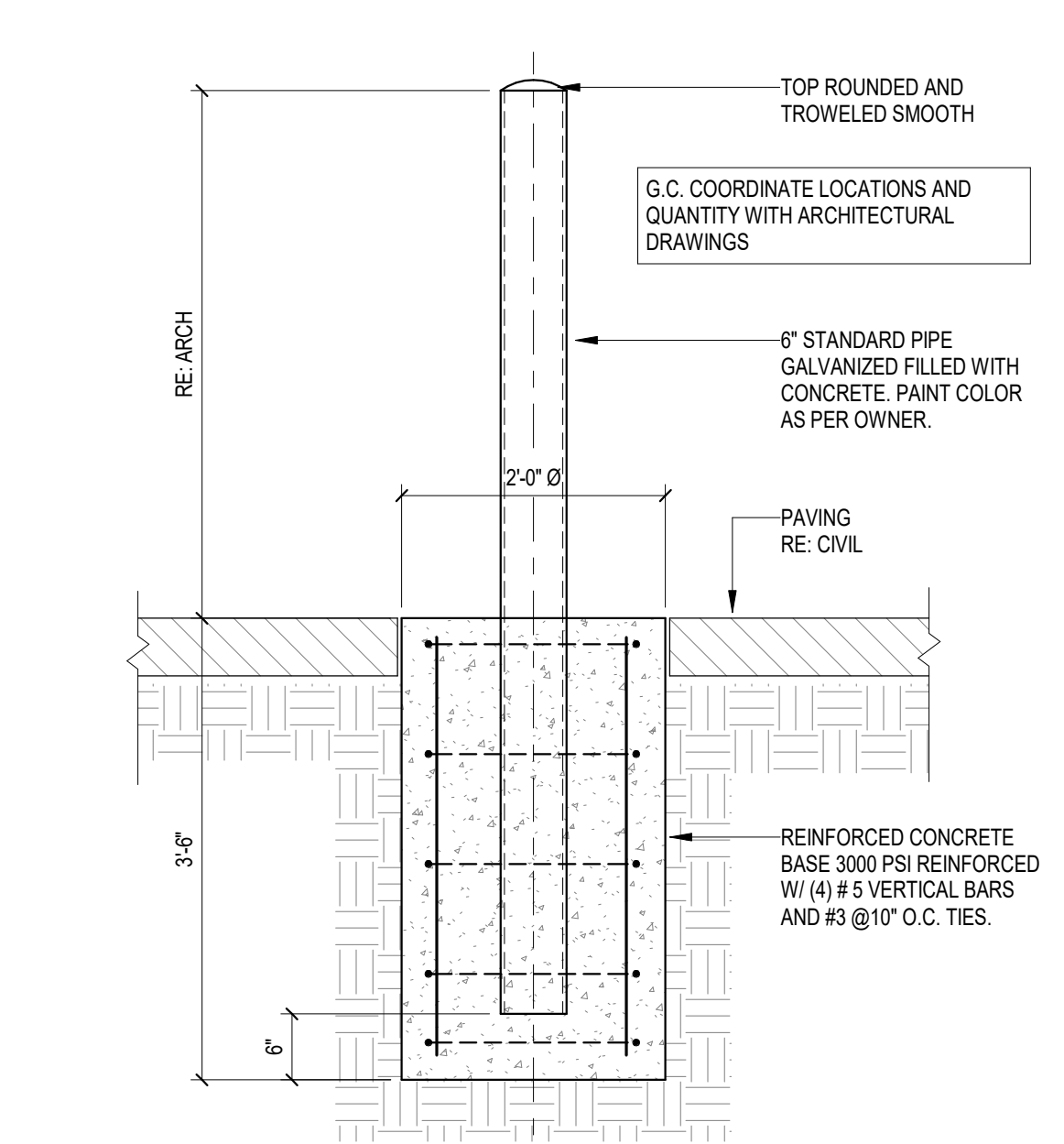
12 HOUSEKEEPING PAD  
3/4" = 1'-0"



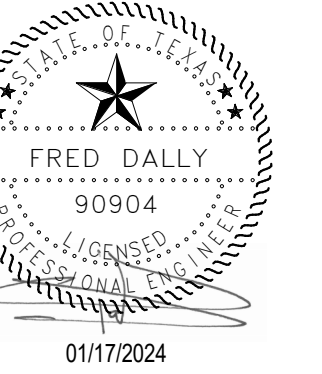
11 TYPICAL TRENCH DRAIN DETAIL  
3/4" = 1'-0"



16 TYPICAL LIGHT POLE DETAIL (30'-0" TALL MAX)  
3/4" = 1'-0"



15 TYPICAL BOLLARD DETAIL  
3/4" = 1'-0"



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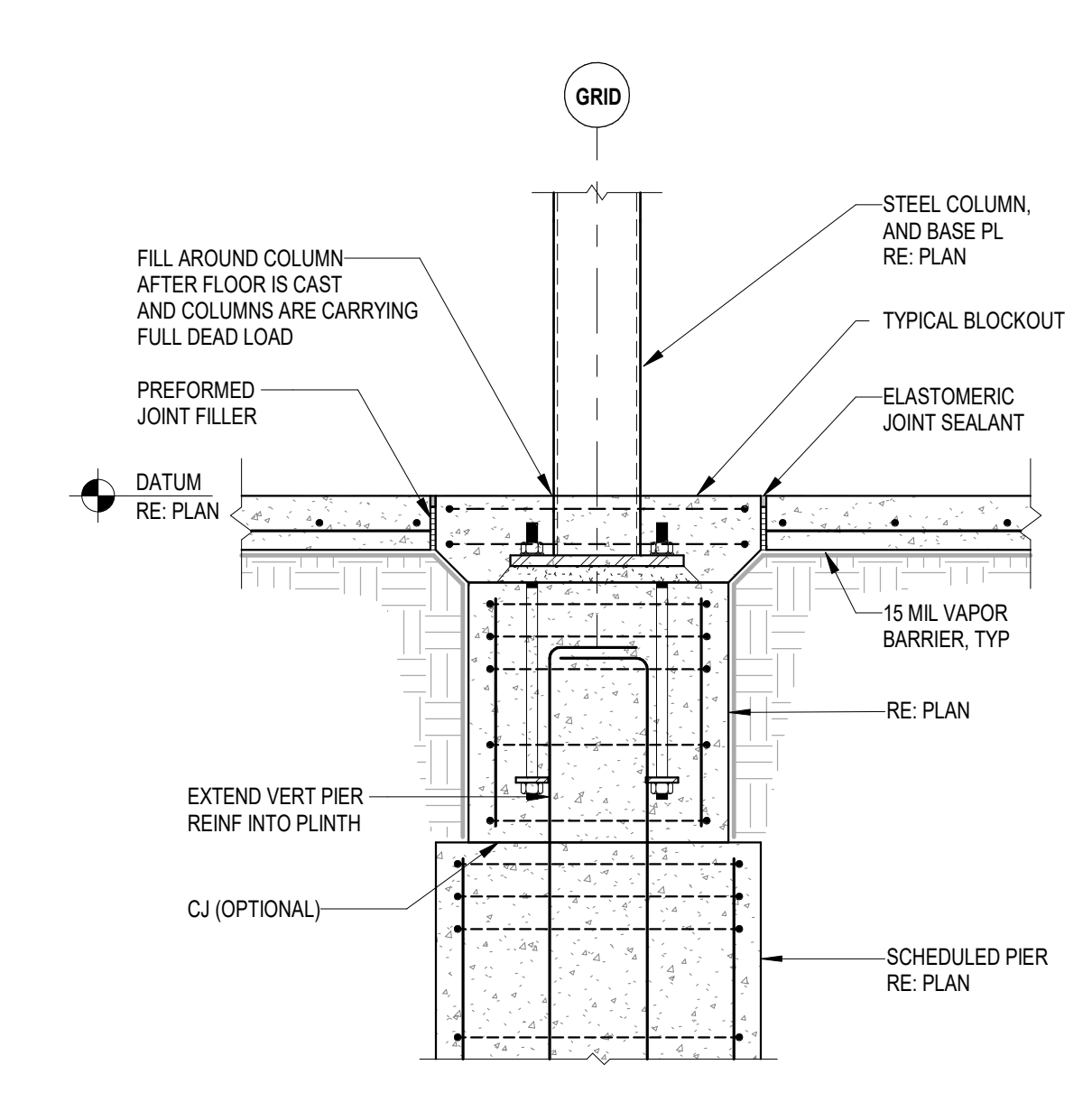
Revisions:

No.	Description	Date
1	Revision 1	Date 1

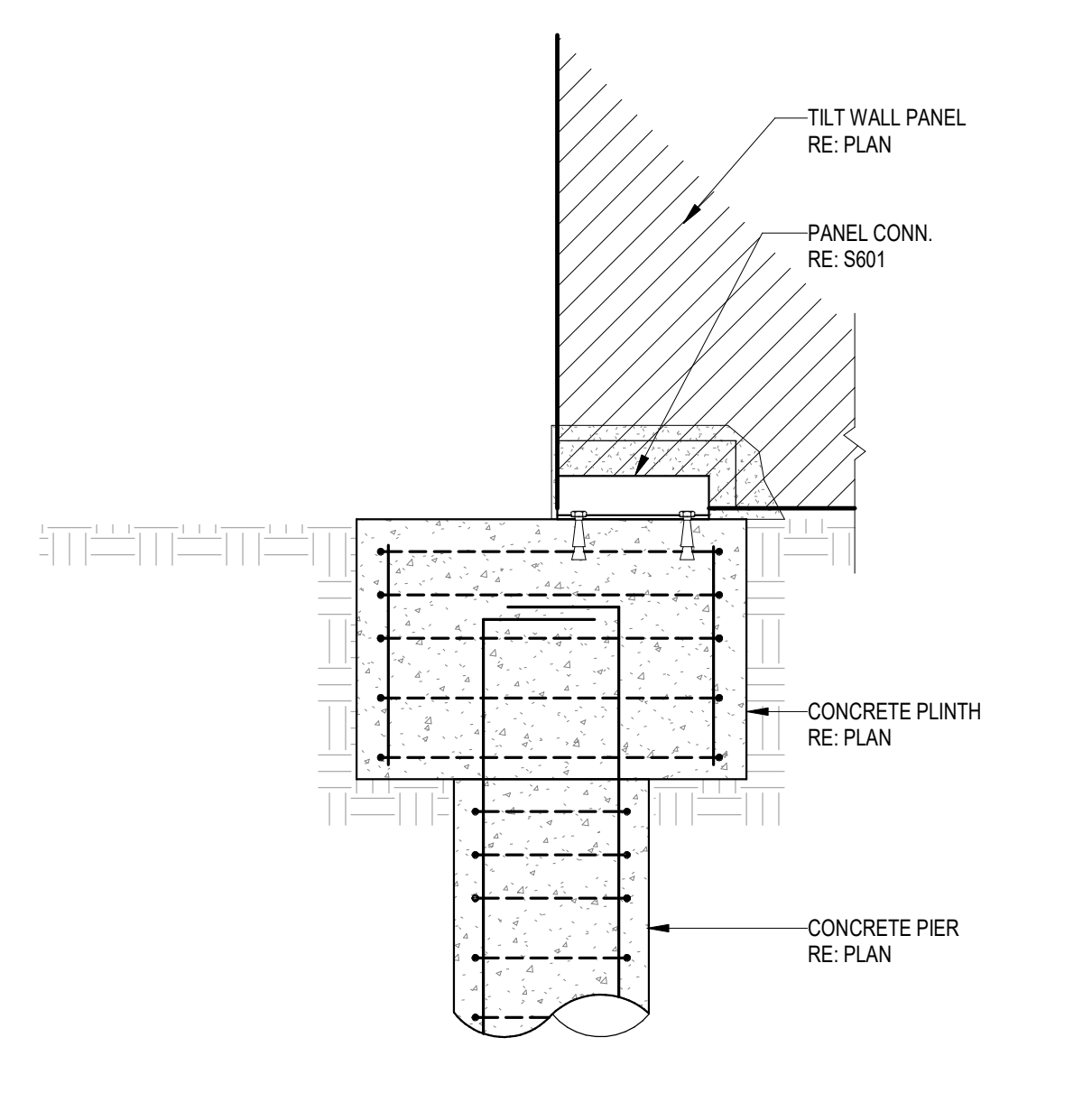
**FOUNDATION  
DETAILS**



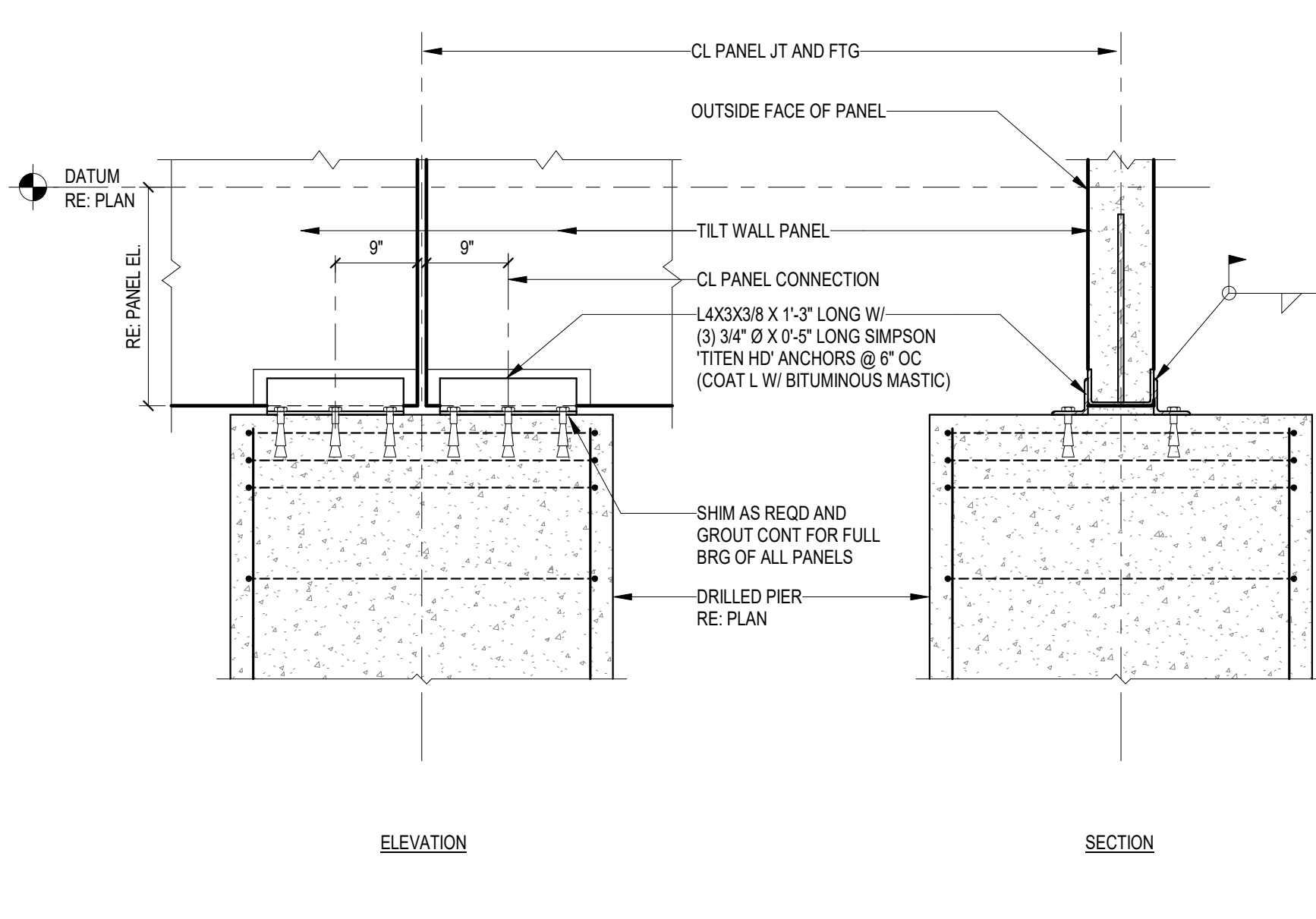
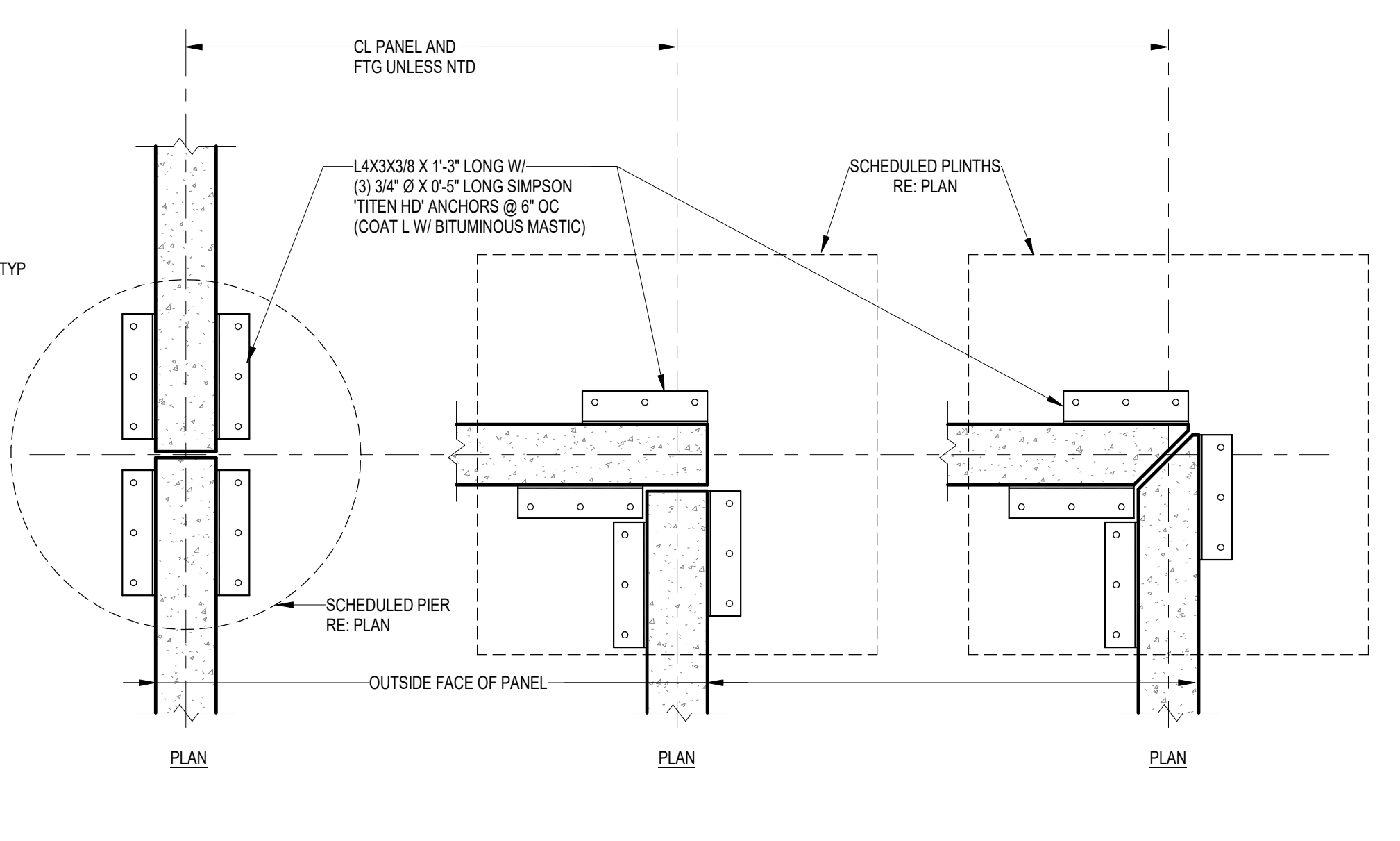
**S402**



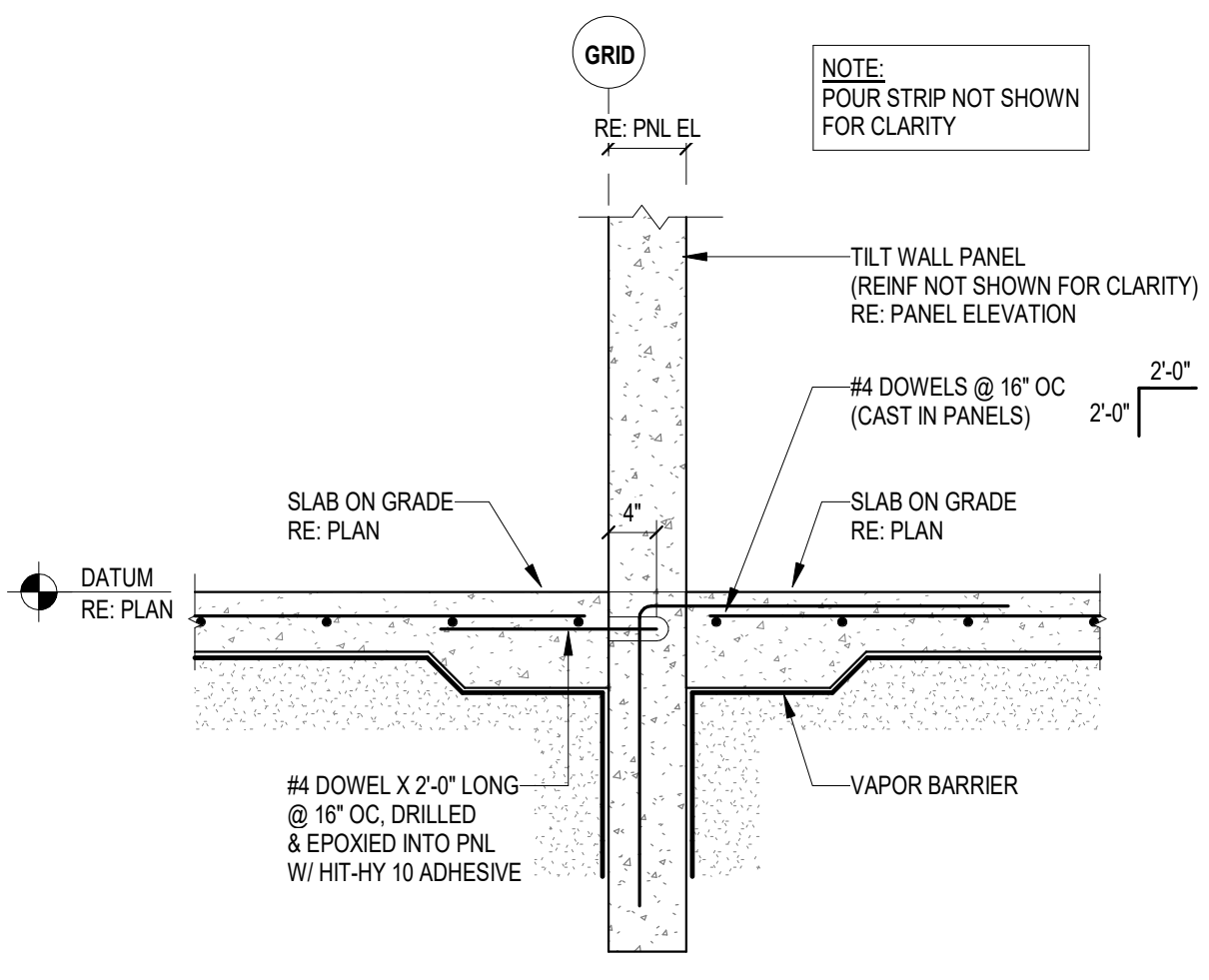
**3 TYPICAL INTERIOR COLUMN SECTION**  
3/4" = 1'-0"



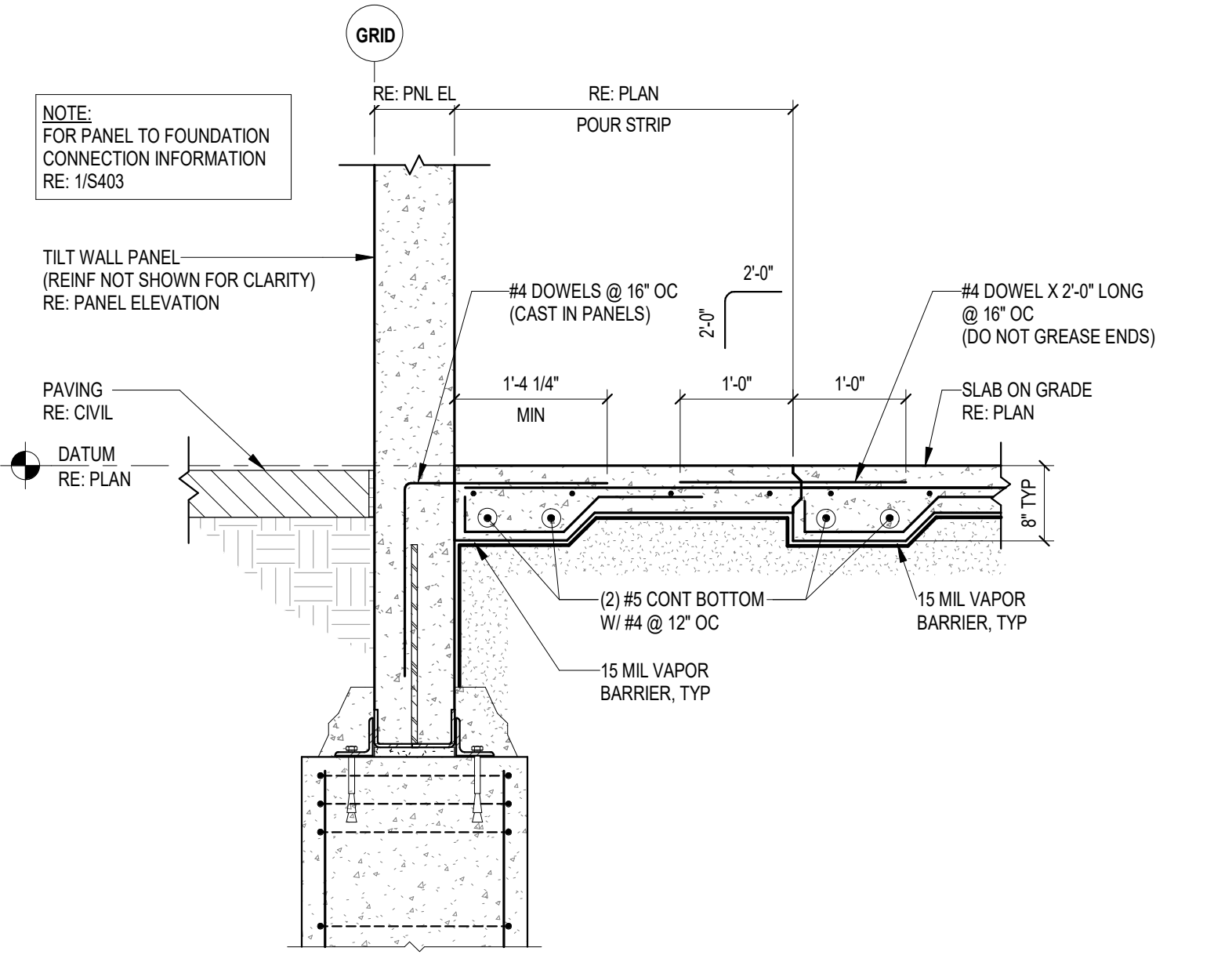
**2 GRADE BEAM AND PANEL CONN. AT PLINTH**  
3/4" = 1'-0"



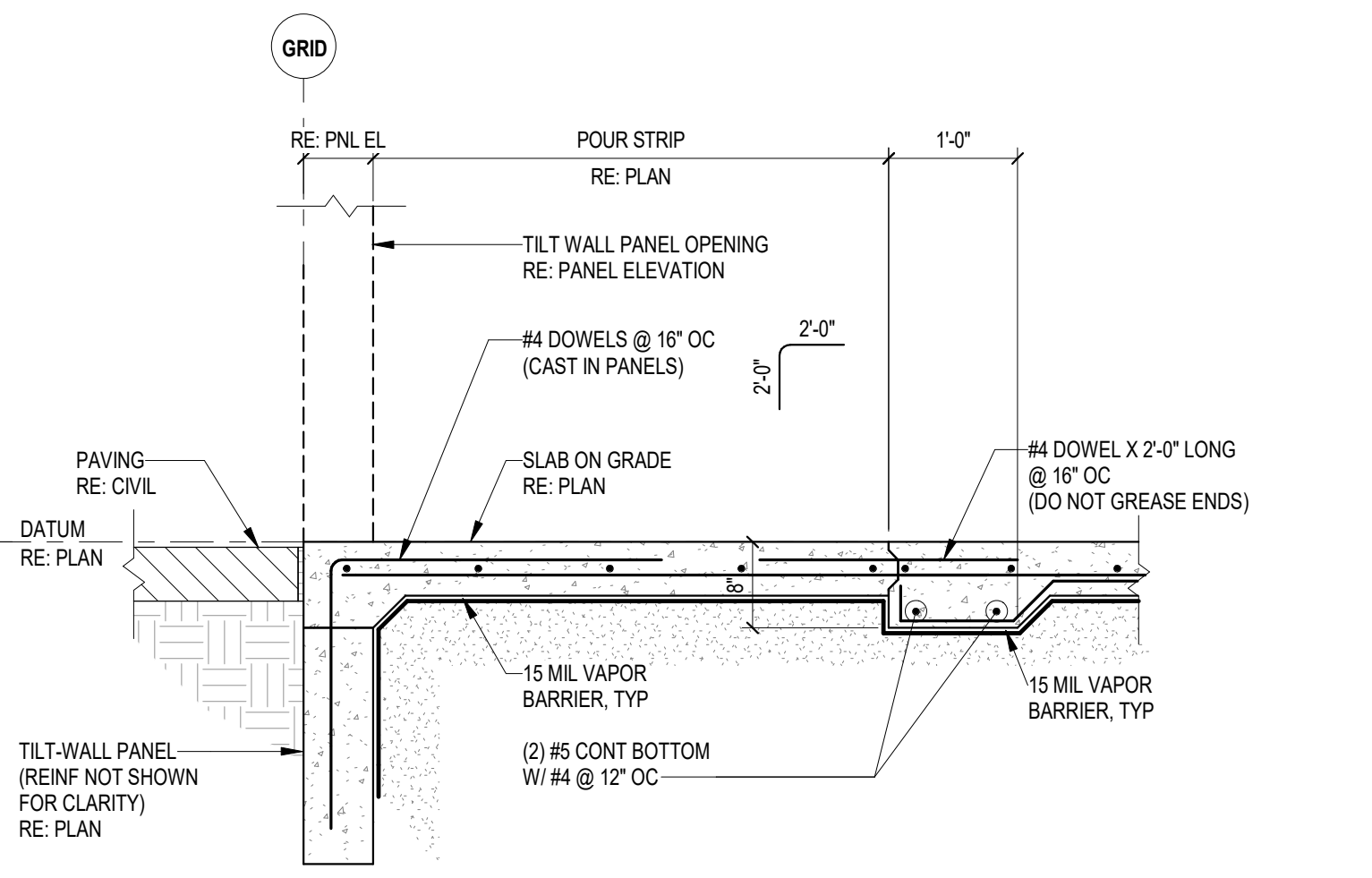
**1 PANEL SUPPORT AT PIER**  
3/4" = 1'-0"



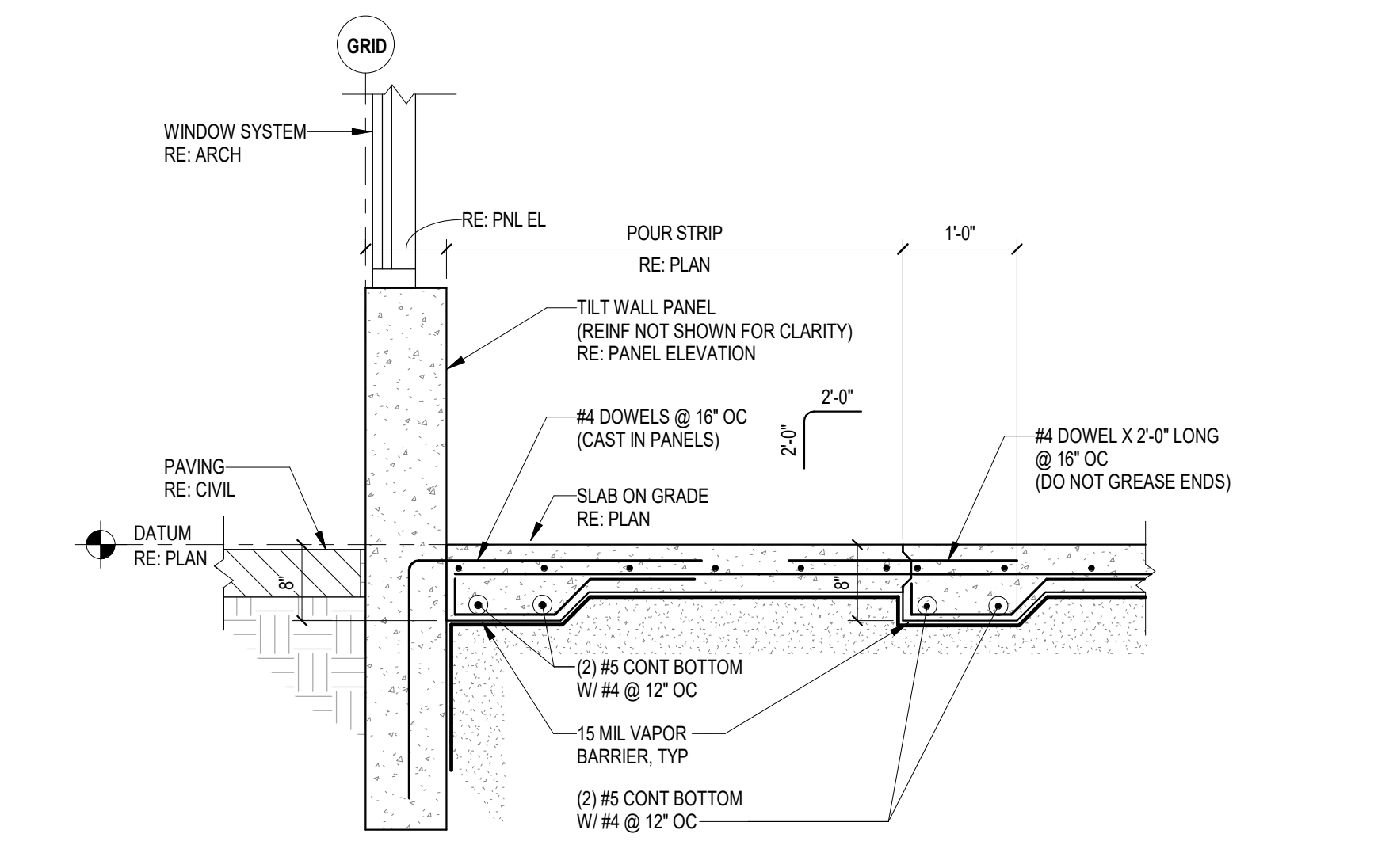
**7 INTERIOR PANEL**  
3/4" = 1'-0"



**6 SLAB EDGE AT TILT UP PANEL**  
3/4" = 1'-0"



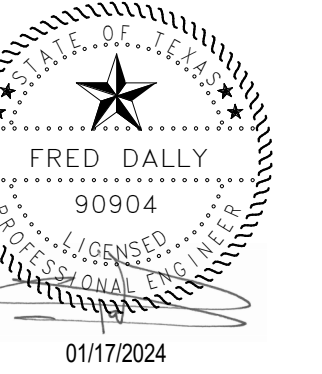
**5 EXTERIOR PANEL OPENING**  
3/4" = 1'-0"



**4 EXTERIOR PANEL**  
3/4" = 1'-0"



**8 SECTION AT MAN DOOR**  
3/4" = 1'-0"



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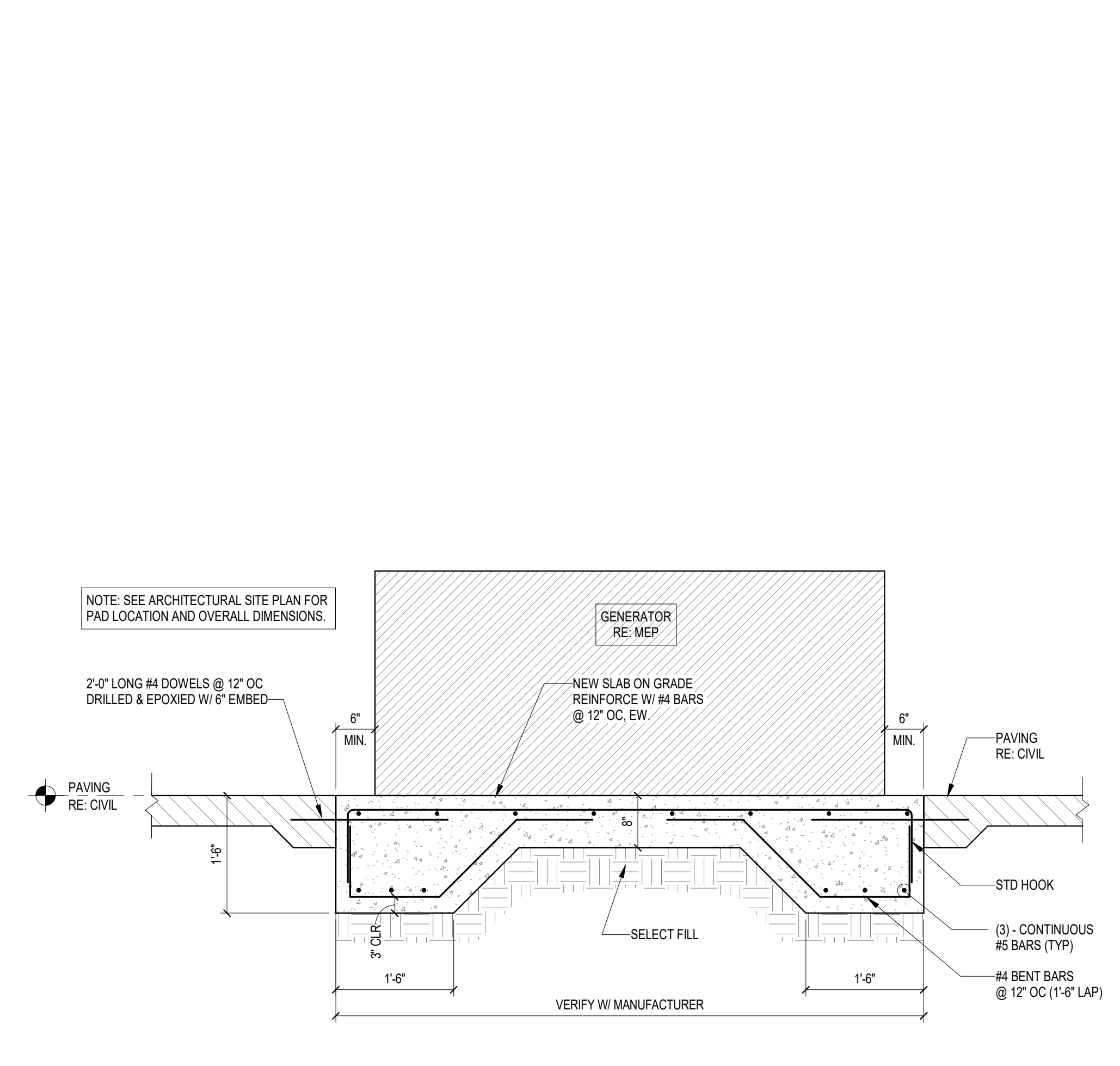
No.	Description	Date
1	Revision 1	Date 1

**FOUNDATION SITE DETAILS**

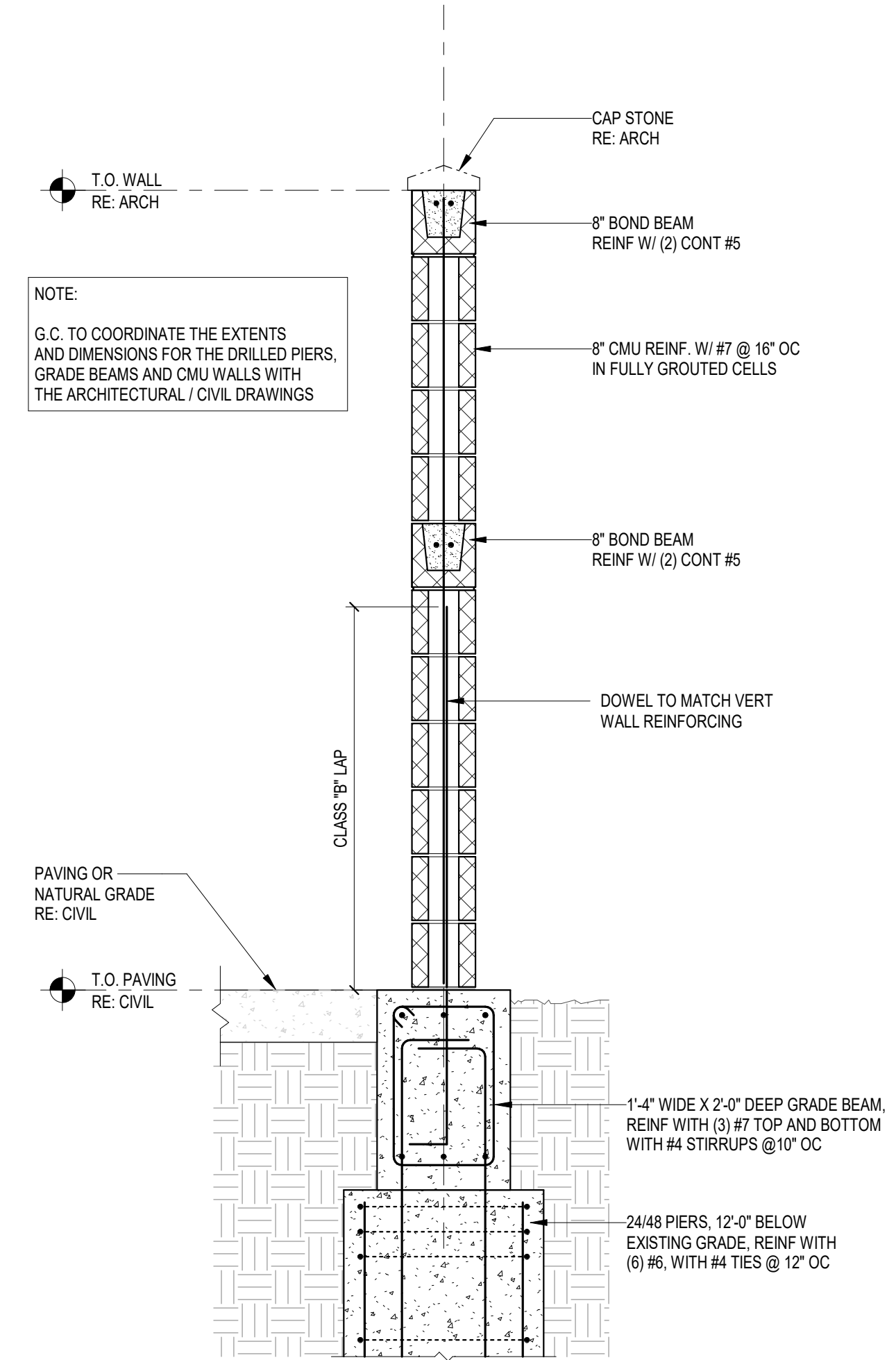
**S403**



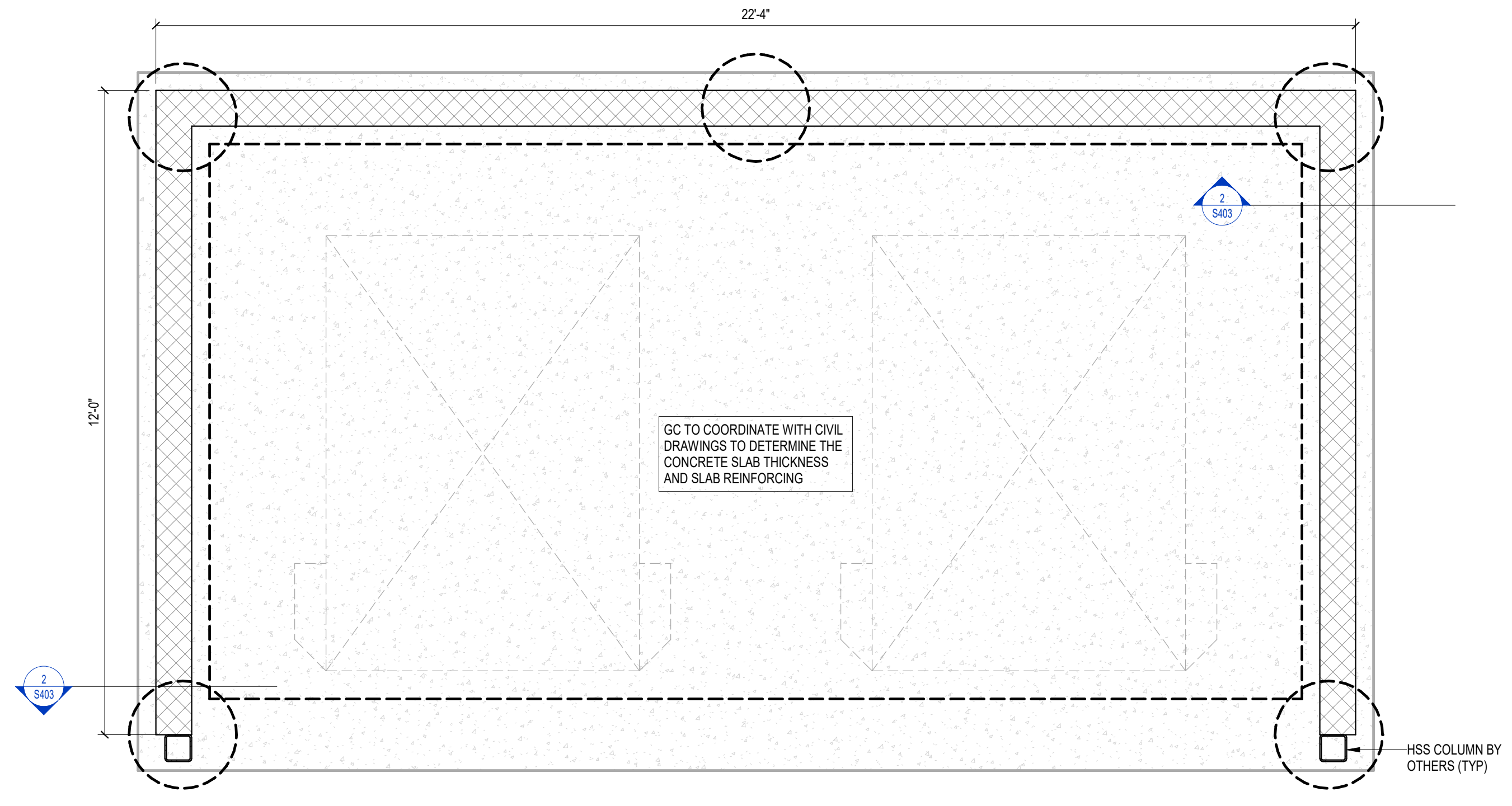
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Houston, Texas 77042  
1 713 337 8881  
Texas Registered Engineering Firm  
F-003426



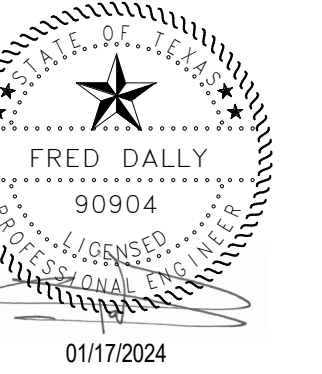
**3 FOUNDATION AT GENERATOR**  
3/4" = 1'-0"



**2 DUMPSTER ENCLOSURE AND GENERATOR FOUNDATION**  
3/4" = 1'-0"



**1 DUMPSTER ENCLOSURE**  
1/2" = 1'-0"



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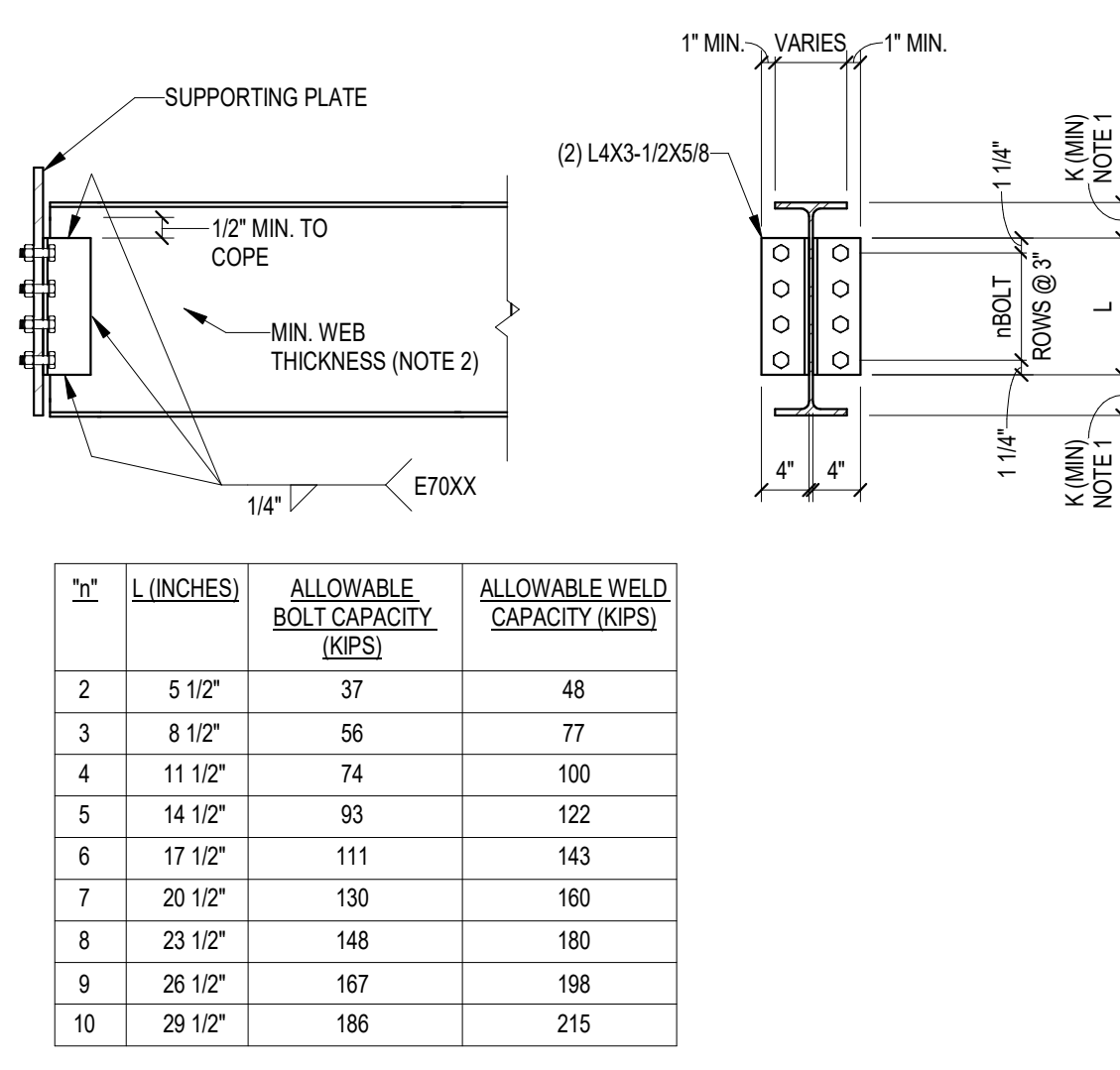
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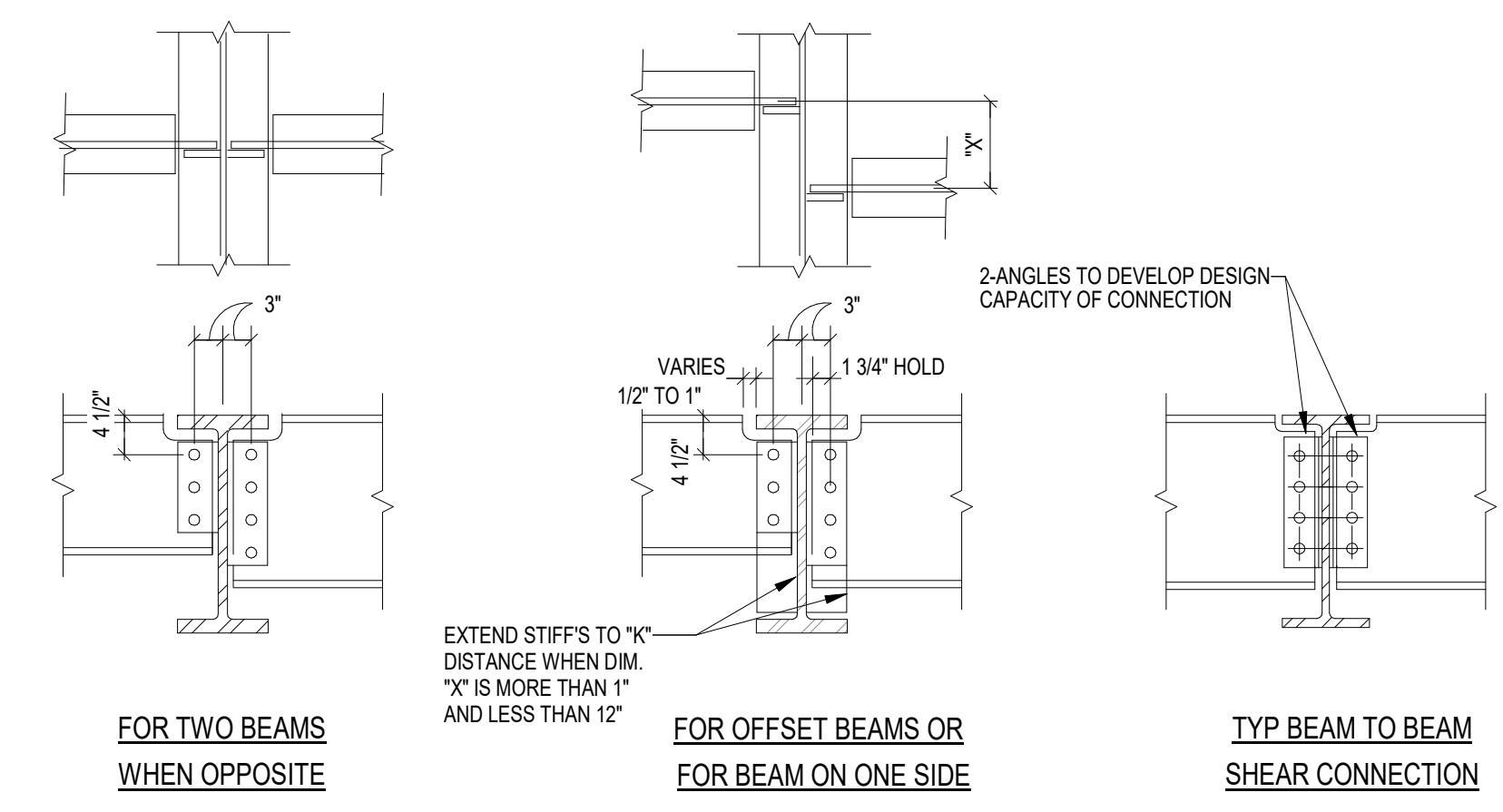
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N <sup>o</sup>	(INCHES)	ALLOWABLE BOLT CAPACITY (KIPS)	ALLOWABLE WELD CAPACITY (KIPS)
2	5 1/2"	37	48
3	8 1/2"	56	77
4	11 1/2"	74	100
5	14 1/2"	93	122
6	17 1/2"	111	143
7	20 1/2"	130	160
8	23 1/2"	148	180
9	26 1/2"	167	198
10	29 1/2"	186	215

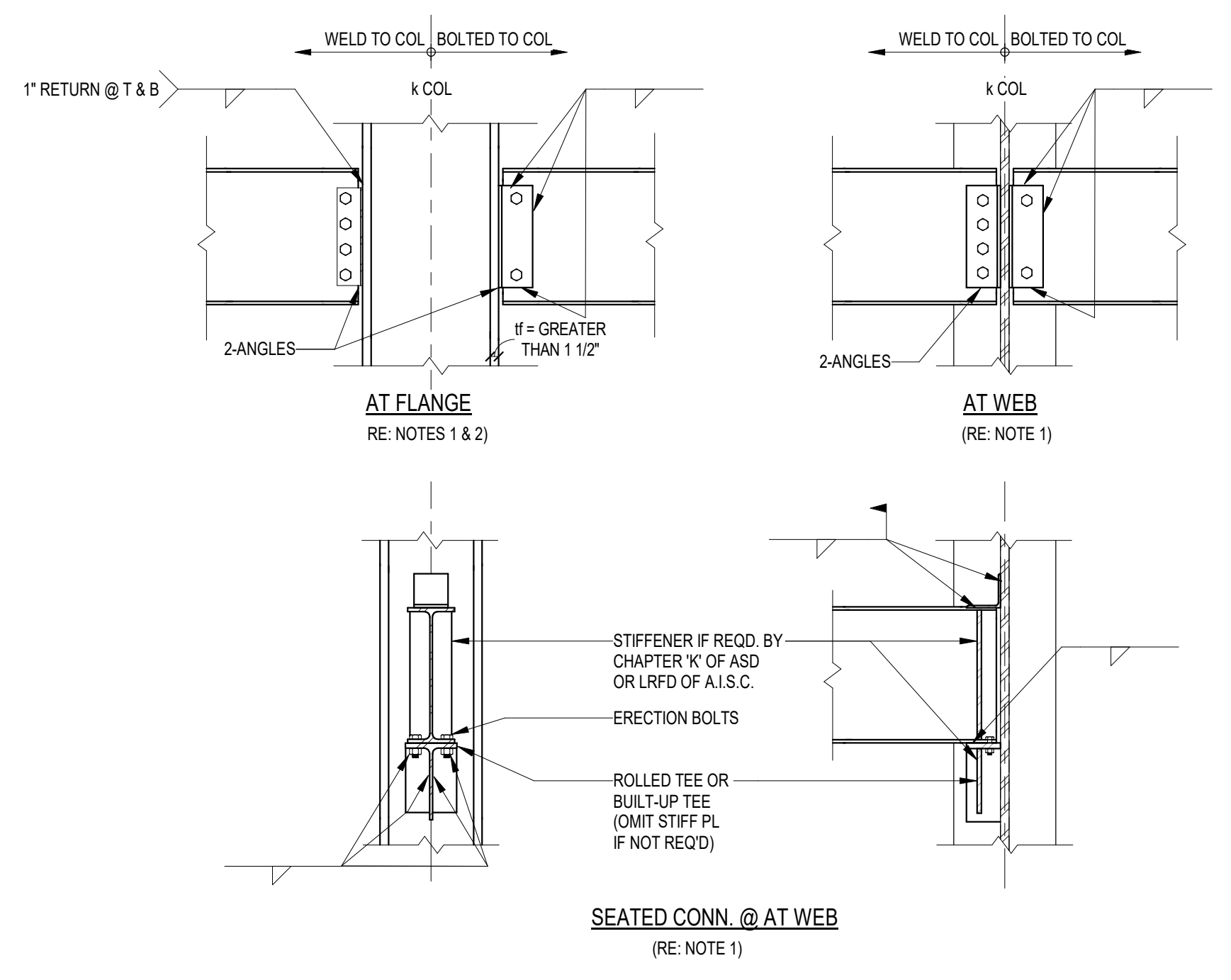
**NOTES:**  
1. REFER TO AISC - MANUAL OF STEEL CONSTRUCTION (SECTION 1).  
2. ALLOWABLE WELD CAPACITY IS BASED UPON A BEAM WEB THICKNESS OF 1/2" FOR A36 MATERIAL AND 3/8" FOR ASTM A572, GRADE 50 MATERIAL. REDUCE THIS CAPACITY PROPORTIONALLY FOR A LESSER WEB THICKNESS.  
3. THE SUPPORTING PLATE CAPACITY SHALL BE BASED UPON AN ALLOWABLE LOAD PER BOLT OF 65 KIPS PER INCH OF PLATE THICKNESS FOR A36 MATERIAL OR 73 KIPS PER INCH OF PLATE THICKNESS FOR ASTM A572, GRADE 50 MATERIAL. FOR BEAM CONNECTIONS ON TWO SIDES, THE SUM OF THE LOADS PER BOLT SHALL BE CONSIDERED.  
4. FOR COPED BEAM CONNECTIONS, THE CAPACITY OF THE NET SHEAR AREA OF THE WEB SHALL BE VERIFIED.  
5. THE CAPACITY OF THE CONNECTION SHALL BE THE LESSER VALUE OF THE ALLOWABLE BOLT CAPACITY, ALLOWABLE WELD CAPACITY, SUPPORTING PLATE CAPACITY OR THE WEB NET SHEAR AREA CAPACITY.  
6. THE MINIMUM NUMBER OF ROWS OF BOLTS SHALL BE AS FOLLOWS:  
W10 & W12 2 ROWS  
W14 & W16 3 ROWS  
W18, W21, & W24 4 ROWS  
W27 & W30 5 ROWS  
W33 & W36 6 ROWS  
3/4" Ø A325 BOLTS - BEARING CONN. - STANDARD HOLES



**FOR TWO BEAMS WHEN OPPOSITE**  
NOTES:-  
1. BOTH THE WELDS & THE BOLTS TO BE DESIGNED FOR MOMENT CAUSED BY ECCENTRICITY BETWEEN WELD GROUP & BOLT CENTERLINE.  
2. END REACTION TO BE DETERMINED PER GENERAL NOTES SHEET OR AS SHOWN ON PLANS.

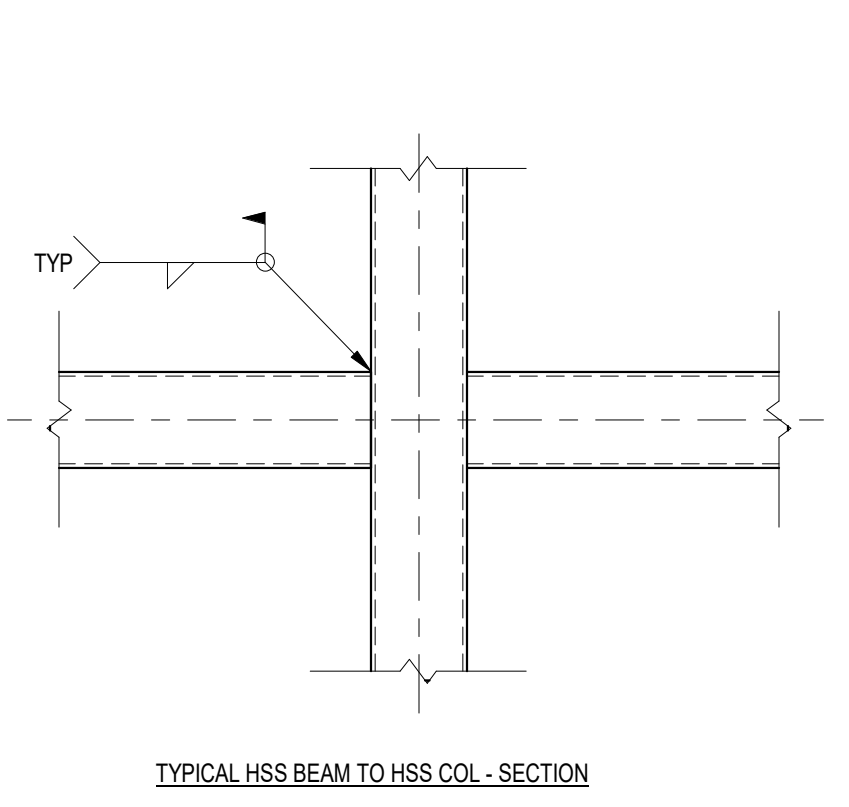
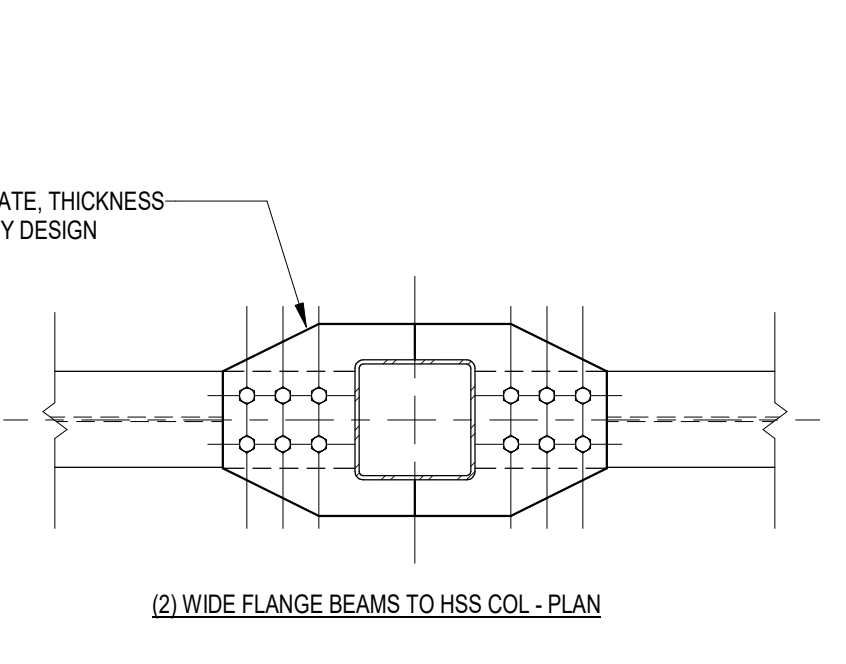
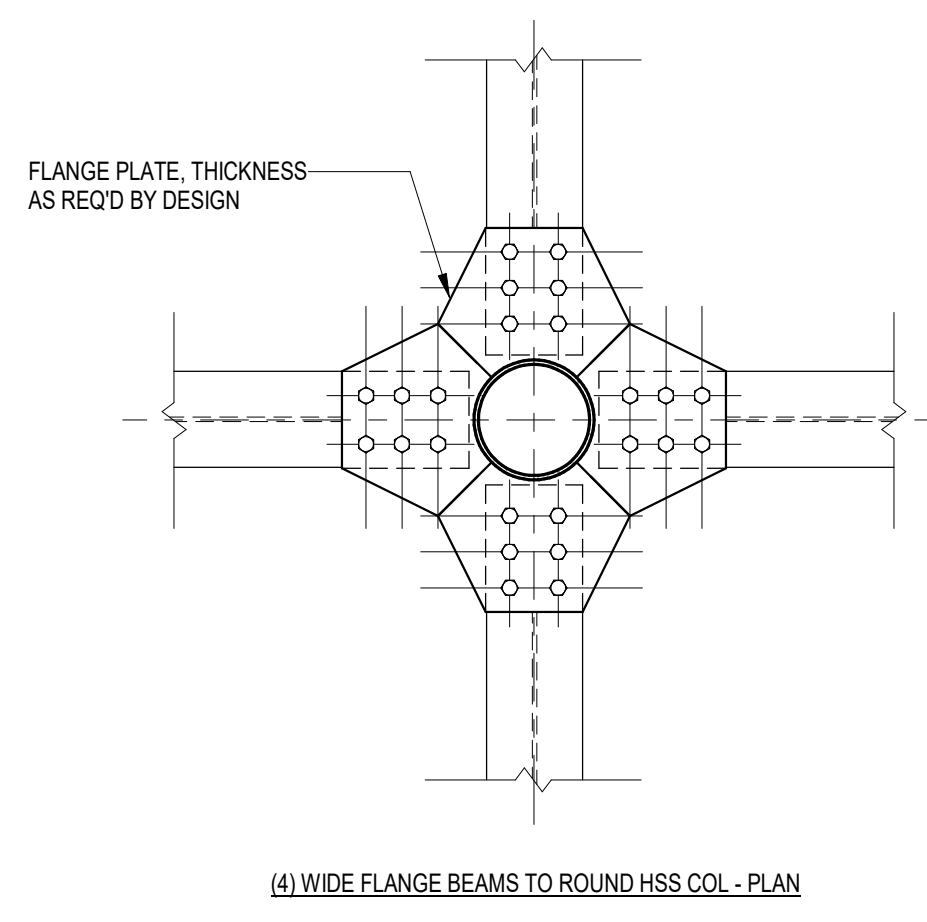
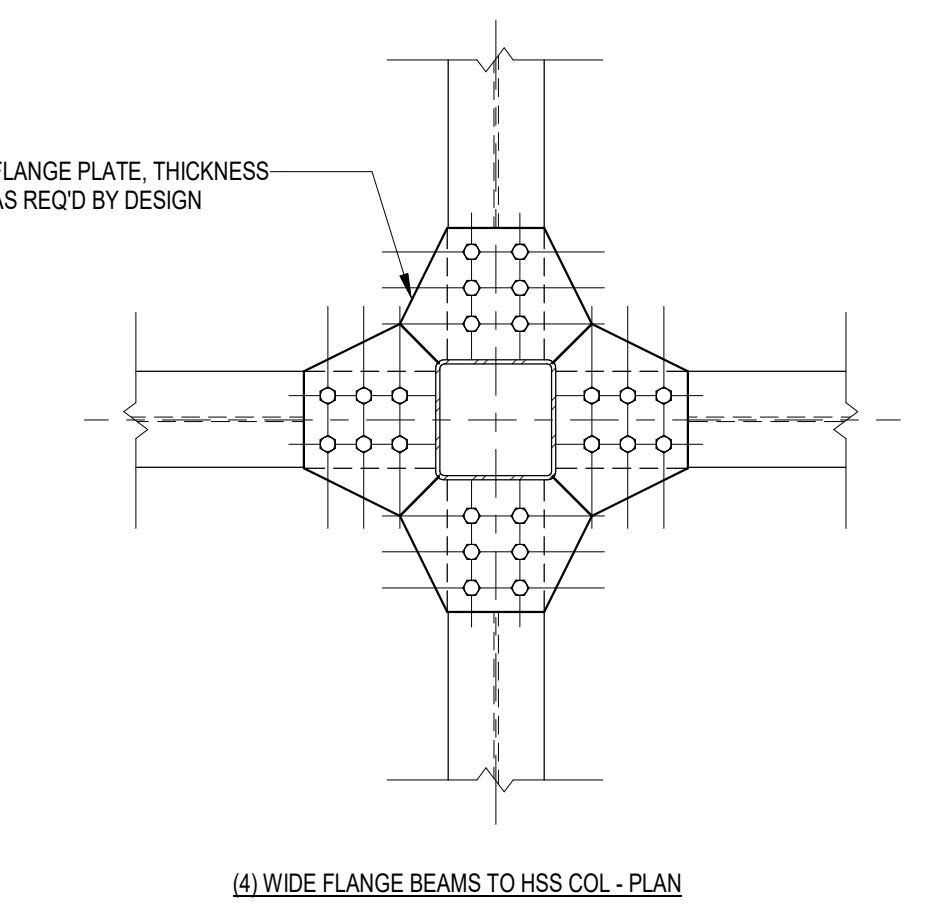
**FOR OFFSET BEAMS OR FOR BEAM ON ONE SIDE**  
EXTEND STIFFS TO "K" DISTANCE WHEN DIM "X" IS MORE THAN 1" AND LESS THAN 12"

**TYP BEAM TO BEAM SHEAR CONNECTION**

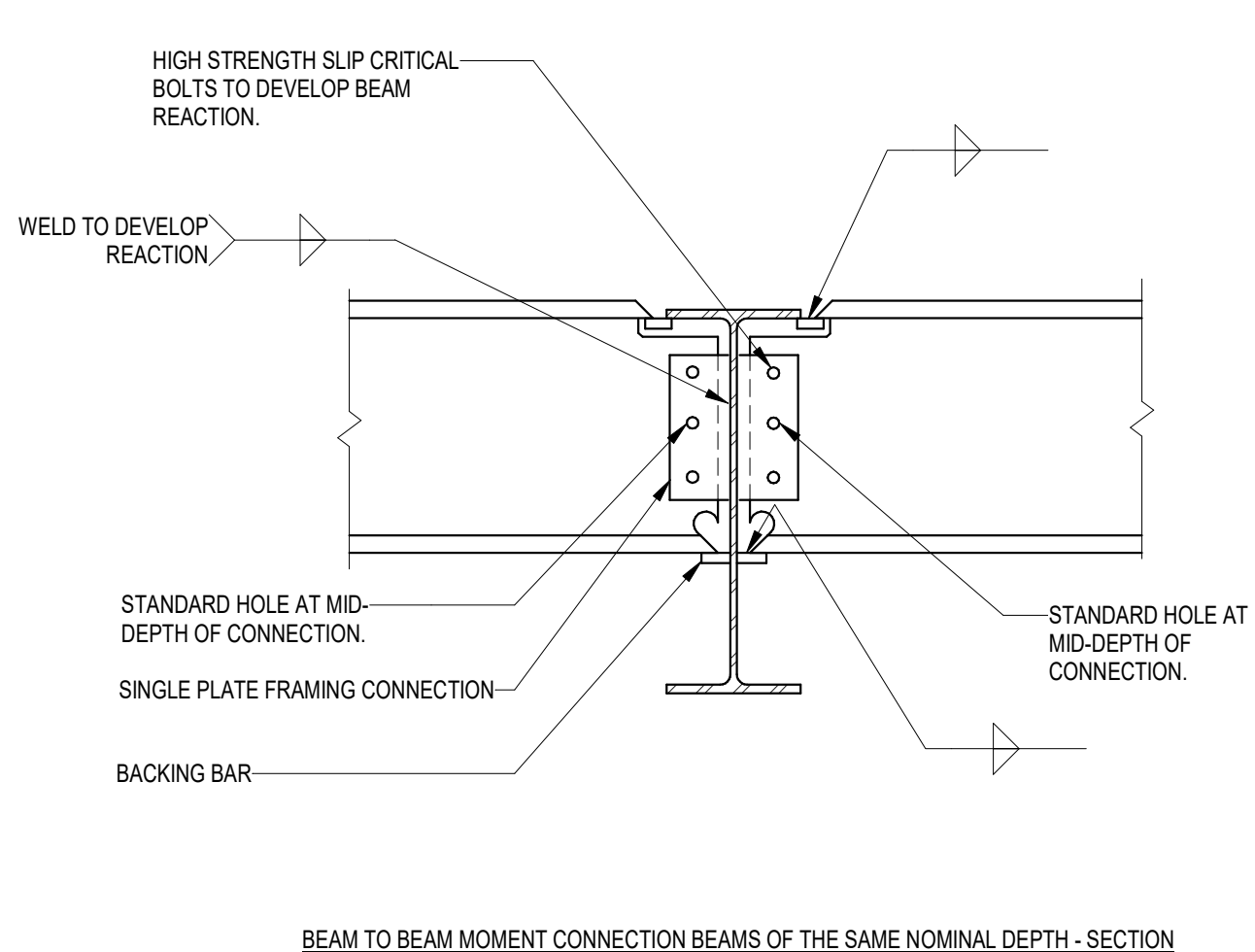


**NOTES:**  
1. CONN. TO BE ADEQUATE FOR AXIAL BRACING FORCE = 1% OF WORKING COLUMN LOAD IN ADDITION TO END REACTION DETERMINED PER STEEL GENERAL NOTES SHEET (U.N.O. ON DWG). ALLOWABLE STRESS CAN BE INCREASED 15% FOR THIS CONDITION. COLUMN LOAD WILL BE FURNISHED OR CAN BE DETERMINED FROM AISC MANUAL FOR FLOOR TO FLOOR HEIGHT.  
2. SINGLE PLATE CONNECTION IS ALLOWED ONLY WHEN AXIAL FORCE BRACING THE COLUMN IS LESS THAN 20 KIPS. THE DESIGN OF SINGLE PLATE CONNECTION WITH AXIAL FORCE LESS THAN 20 KIPS SHOULD BE SUBSTANTIATED BY CALCULATION AND IS SUBJECT TO ENGINEER'S APPROVAL.  
3/4" Ø A325 BOLTS - BEARING CONN. - STANDARD HOLES

**1 STANDARD BEAM CONNECTION**  
3/4" = 1'-0"

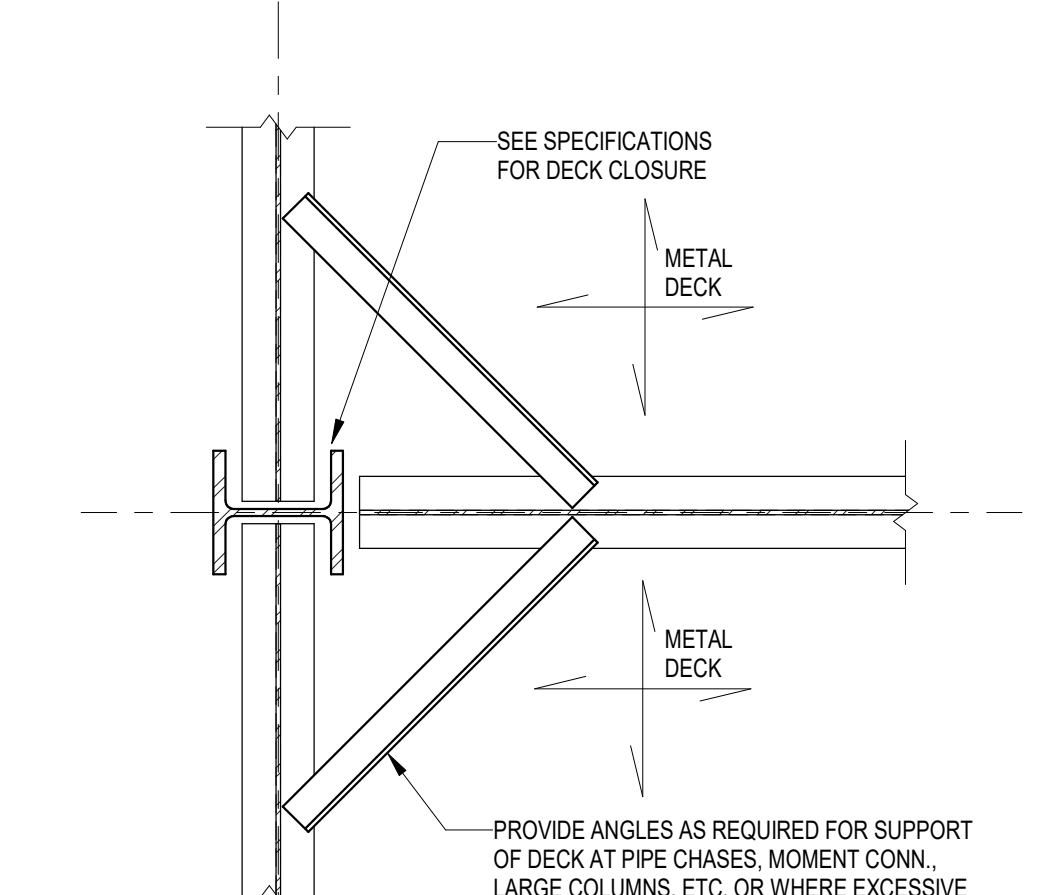
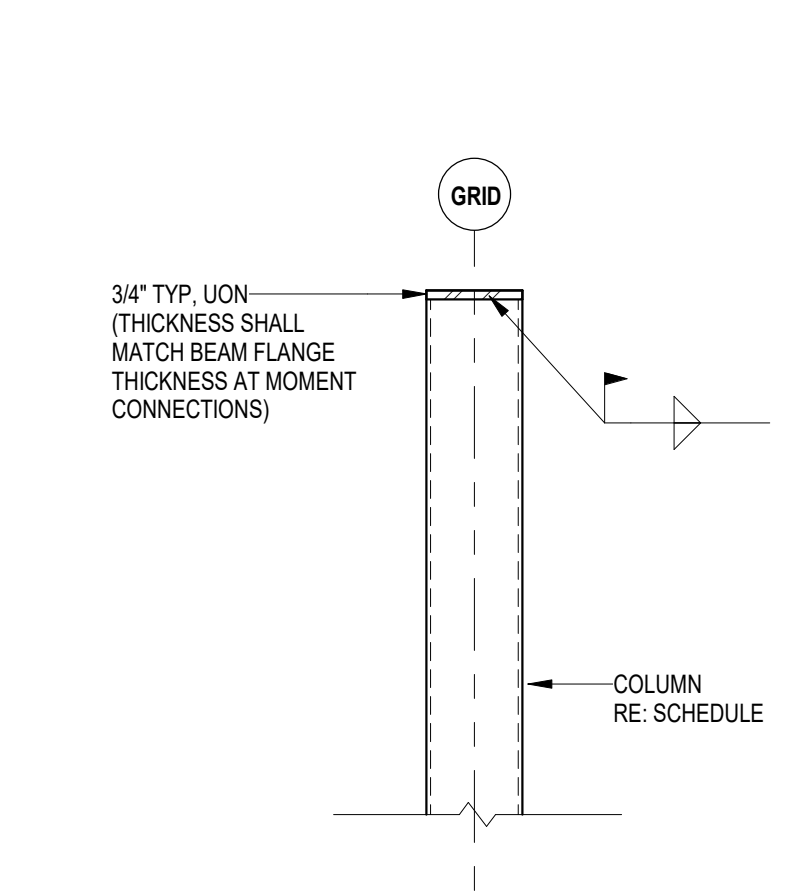
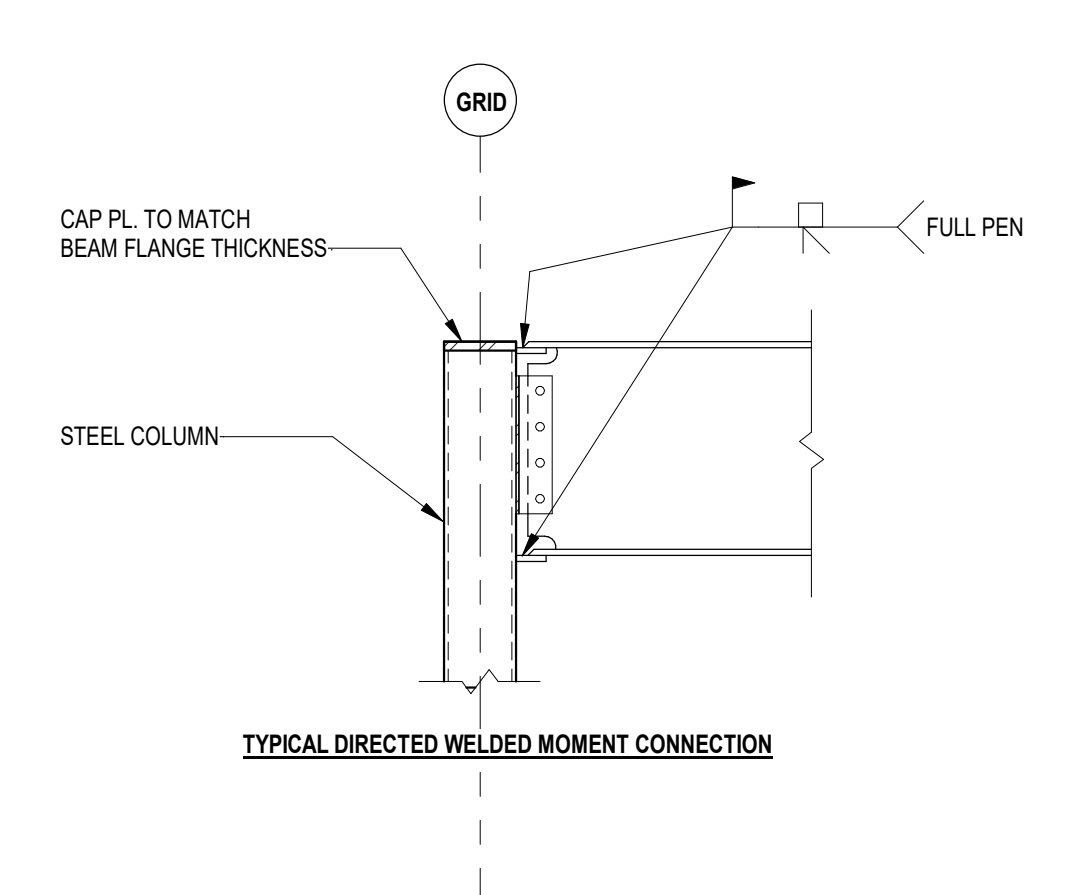
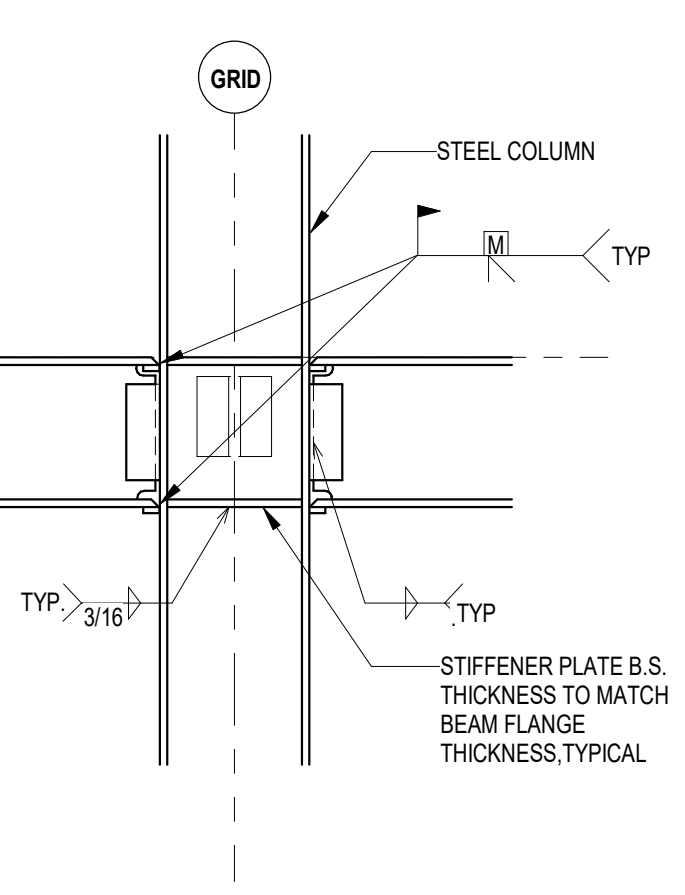
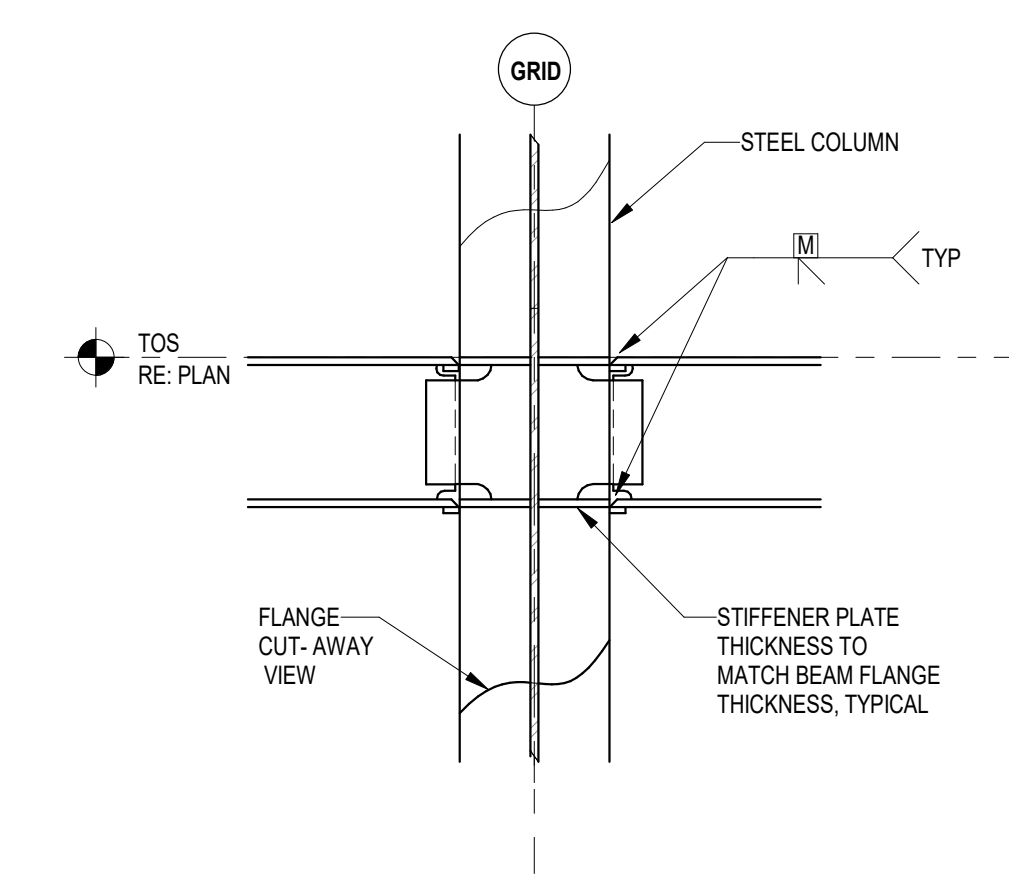


**3 TYPICAL BEAM TO COLUMN CONN. @ FLANGE & WEB**  
N.T.S.



**NOTES:**  
1. BOLTS IN WEB CONNECTION SHALL BE SNUG TIGHTENED PRIOR TO WELDING OF FLANGES.  
2. SLIP CRITICAL BOLTED CONNECTION IN WEB USING A325 BOLTS IN HORIZONTAL SHORT-SLOTTED HOLES (U.O. RESISTANCE BY BOLTS TO SHEAR SHALL BE BY FRICTION. PROPORTIONED USING THE STANDARD HOLE VALUE ON A CLASS "A" SURFACE.  
3. REFER TO SPECIFICATIONS FOR CONNECTION DESIGN CRITERIA.  
4. PROVIDE PREDESIGNED SHEAR CONNECTIONS AS SHOWN IN AISC LRFD MANUAL WHERE APPLICABLE.  
5. IF MOMENT IS SHOWN ON DRAWINGS, PARTIAL PENETRATION WELD TO DEVELOP MOMENT CAN BE USED IN LIEU OF C/P WELD. FOR THIS CASE, WELD SHALL BE REQUIRED TO DEVELOP THE BEAM FLANGE FORCE COMPUTED AS FOLLOWS:  $P_u = (M_u) / (0.95D)$  WHERE:  $M_u$  = DESIGN MOMENT (KIP-IN),  $D$  = BEAM DEPTH (INCHES),  $P_u$  = BEAM FLANGE FORCE (KIPS).  
6. ALL MOMENT CONNECTIONS DETAILS SHOWN IN THIS SHEET ARE FOR REFERENCE ONLY TO SHOW THE INTENT OF THE DESIGN. STEEL FABRICATOR TO DETERMINE DESIGN ALL REQUIRED BOLTING, PLATES WELDING TO REINFORCE BEAMS AND COLUMNS AS NEEDED TO ACHIEVE 100% BEAM CAPACITY AND PROVIDE SIGNED SEALED CALCULATIONS BY LICENSED ENGINEER IN STATE OF TEXAS TO EOR FOR REVIEW.

**4 MOMENT CONNECTION DETAILS**  
3/4" = 1'-0"



**5 TYPICAL MOMENT CONN. AT WIDE FLANGE COLUMNS**  
1/2" = 1'-0"

**6 TYPICAL DIRECT WILDED MOMENT CONN.**  
3/4" = 1'-0"

**7 TYPICAL COLUMN CAP PLATE**  
3/4" = 1'-0"

**8 METAL DECK SUPPORT AT COLUMN**  
3/4" = 1'-0"

Project No.: 2330

Drawing Date: 01/17/2024  
Drawn: MR  
Checked: SJ  
Scale: AS NOTED

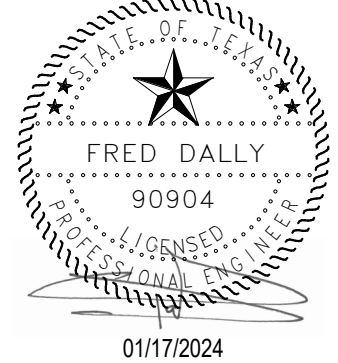
Issue Log:

No.	Description	Date
1	100%CD	01.17.2024

Revisions:

No.	Description	Date

TYPICAL FRAMING DETAILS

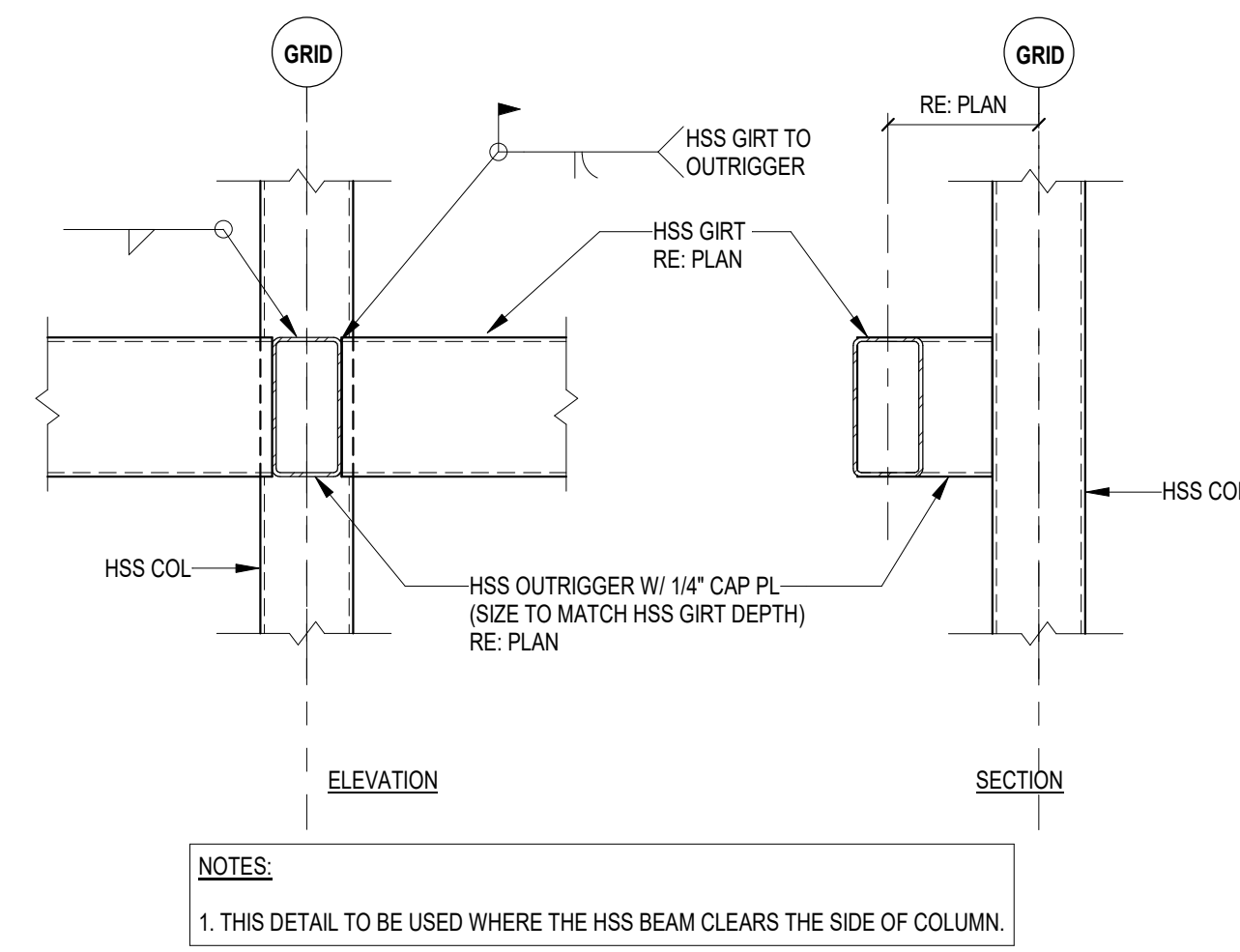


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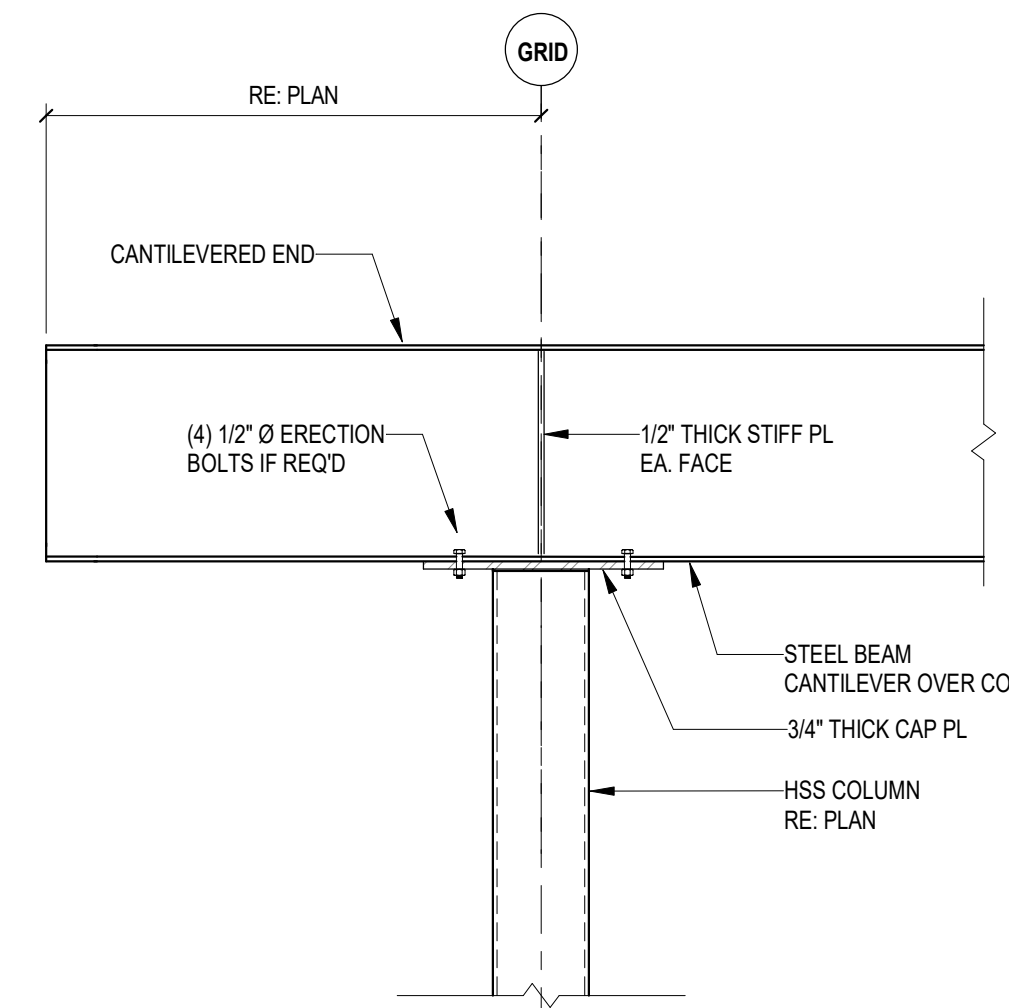
Landscape CONSULTANT:  
Amanda Buckson  
12337 Jones Rd Suite 400  
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tel. 832.273.2185  
ABuckson@BucksonLA.com

Structural CONSULTANT:  
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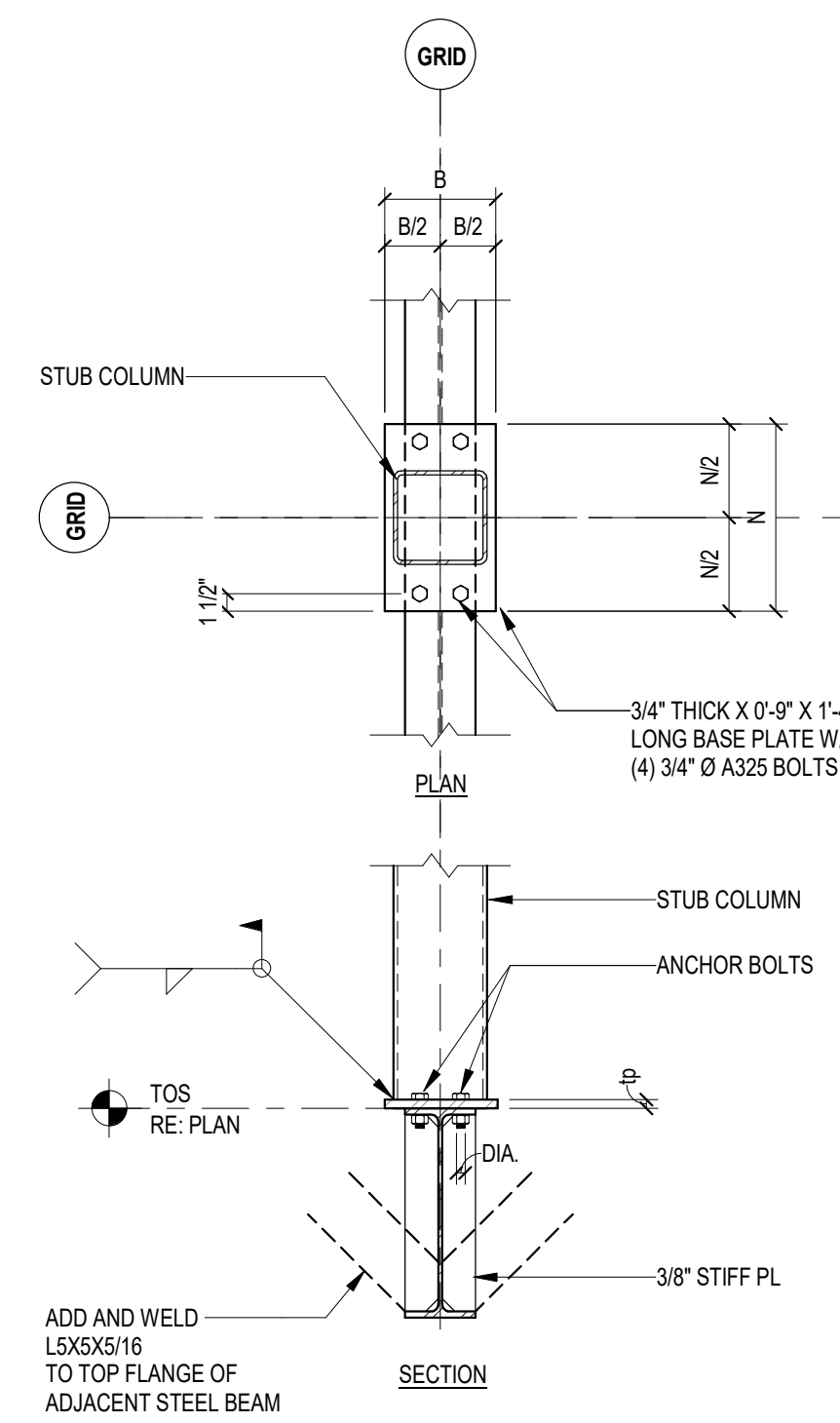
MEP CONSULTANT:  
Wheaton Engineering & Environmental  
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410 S Enterprize Pkwy  
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tel. 361.299.1801  
rwheaton@wheaton-ees.com



**1** TYPICAL OFFSET HSS TUBE SUPPORT  
3/4\" = 1'-0"



**2** TYPICAL CANTILEVERED BEAM  
3/4\" = 1'-0"



**3** TYPICAL STUB COLUMN DETAIL  
3/4\" = 1'-0"

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Checked: SI  
Scale: AS NOTED

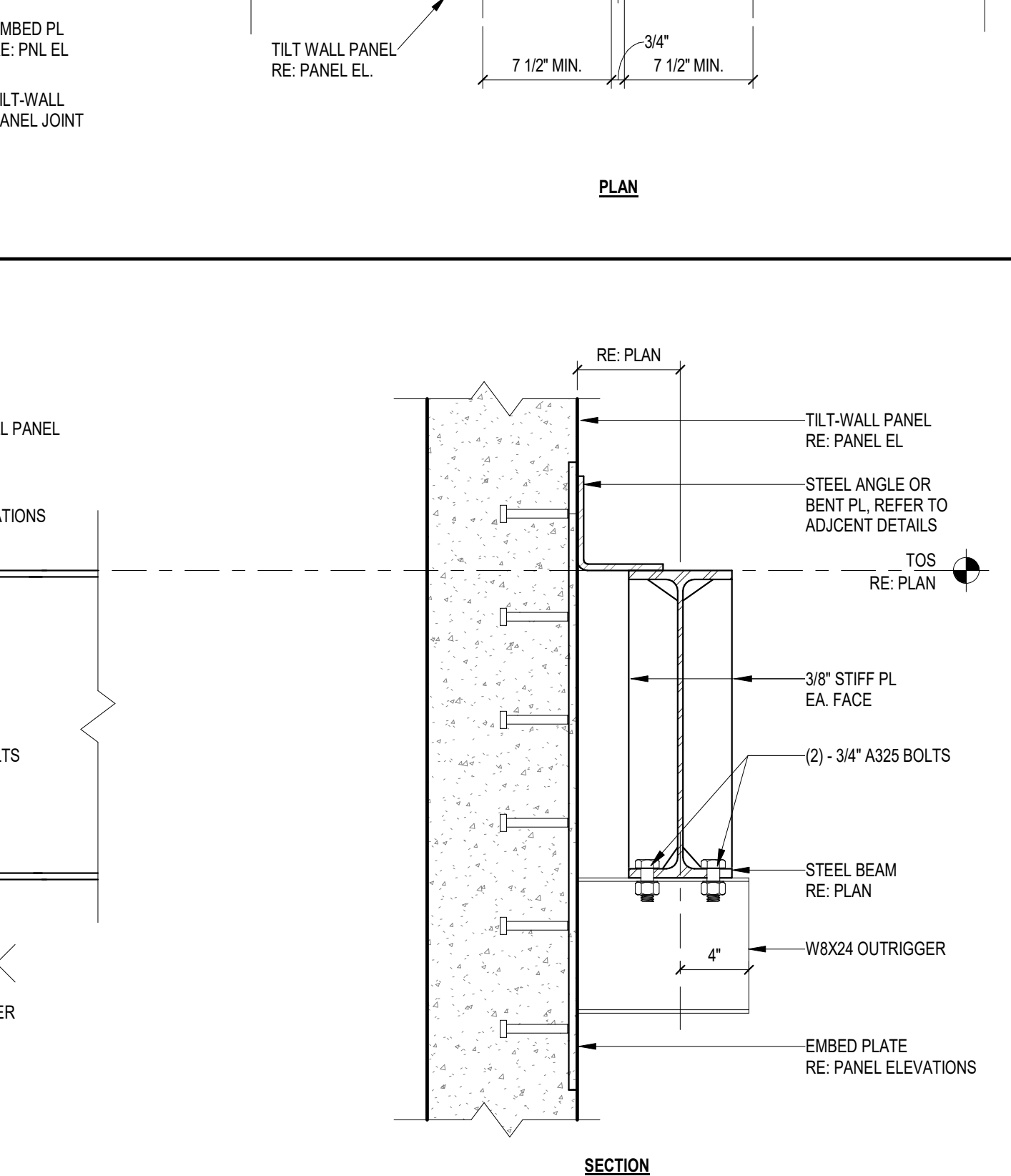
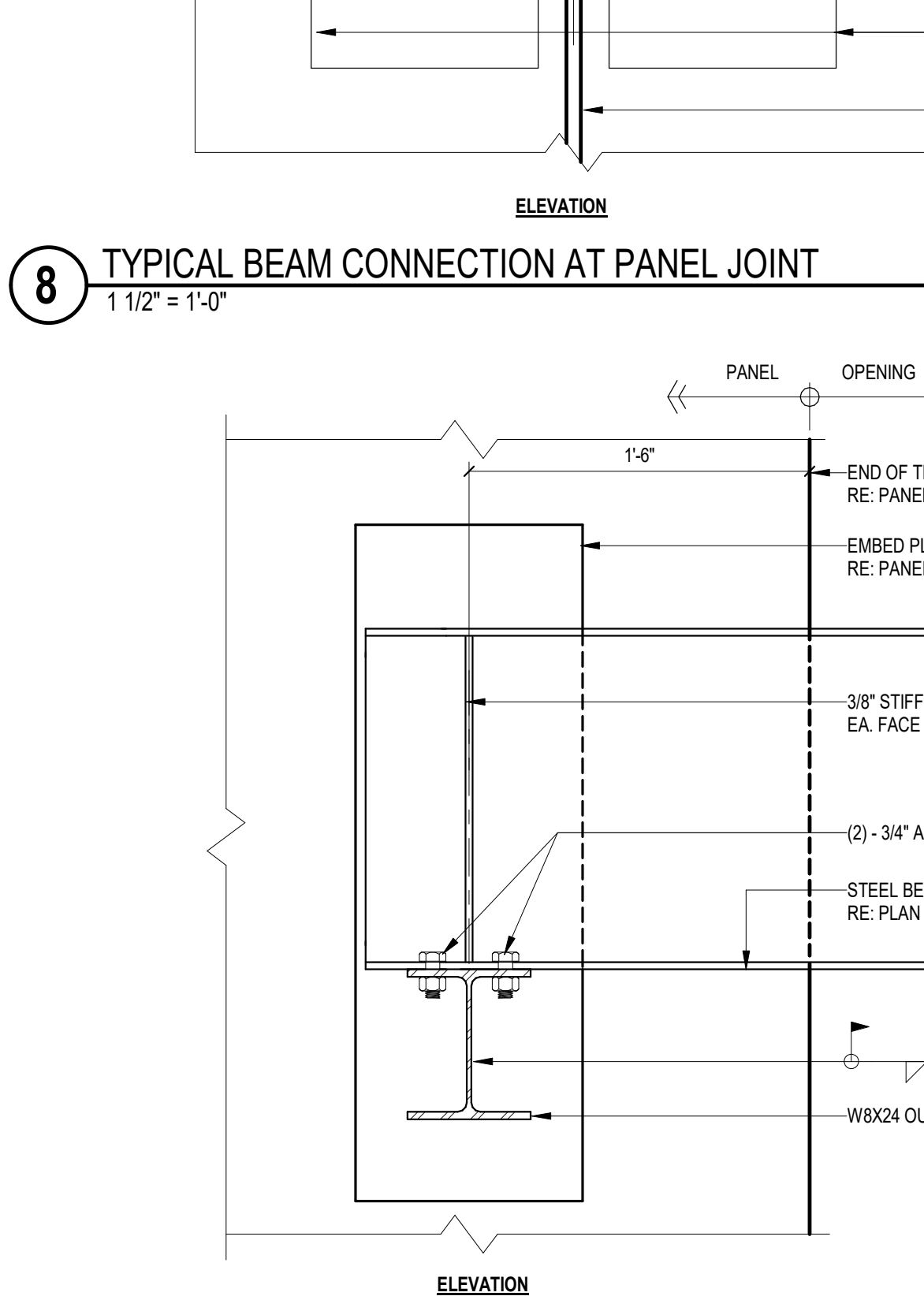
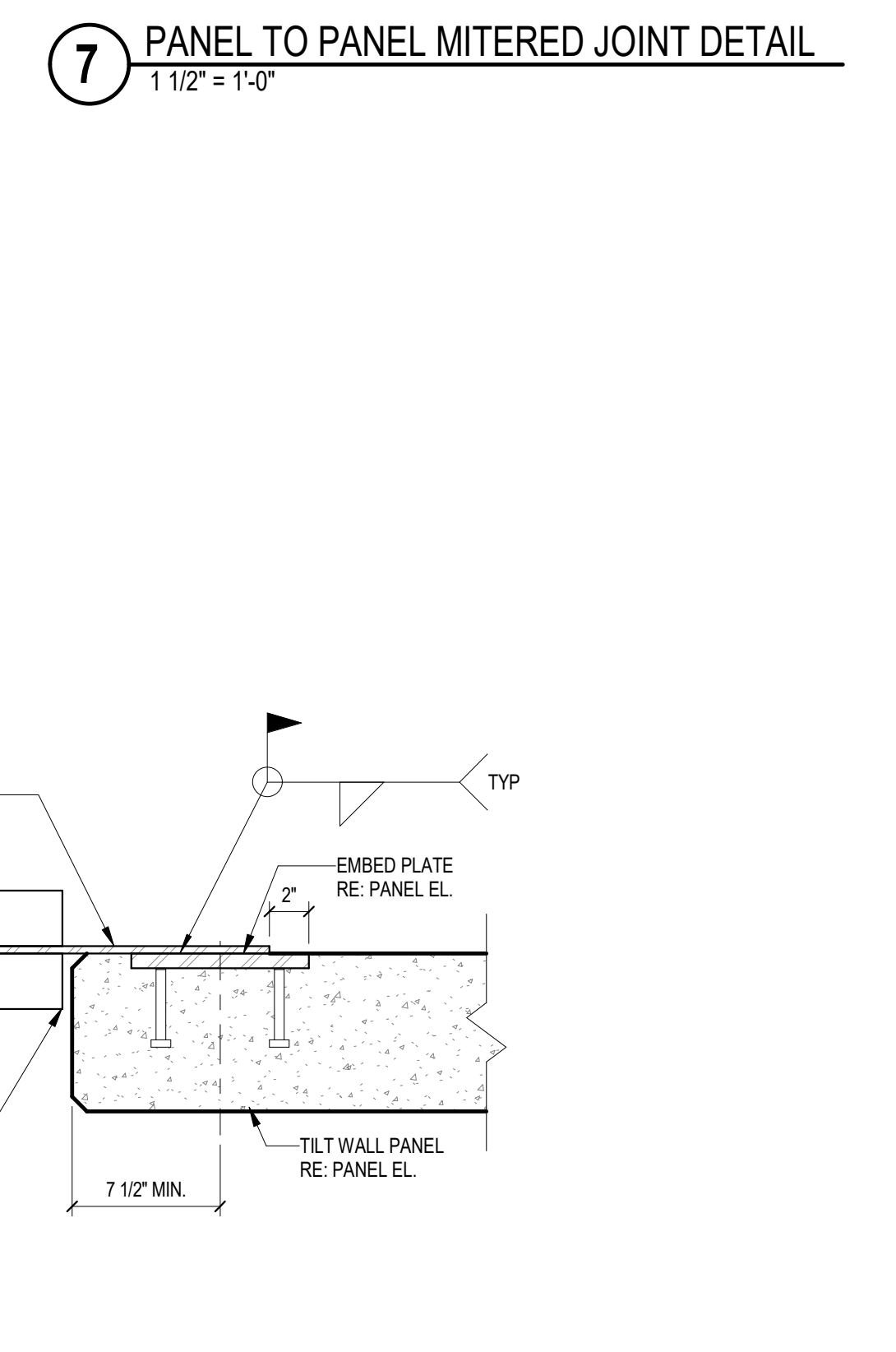
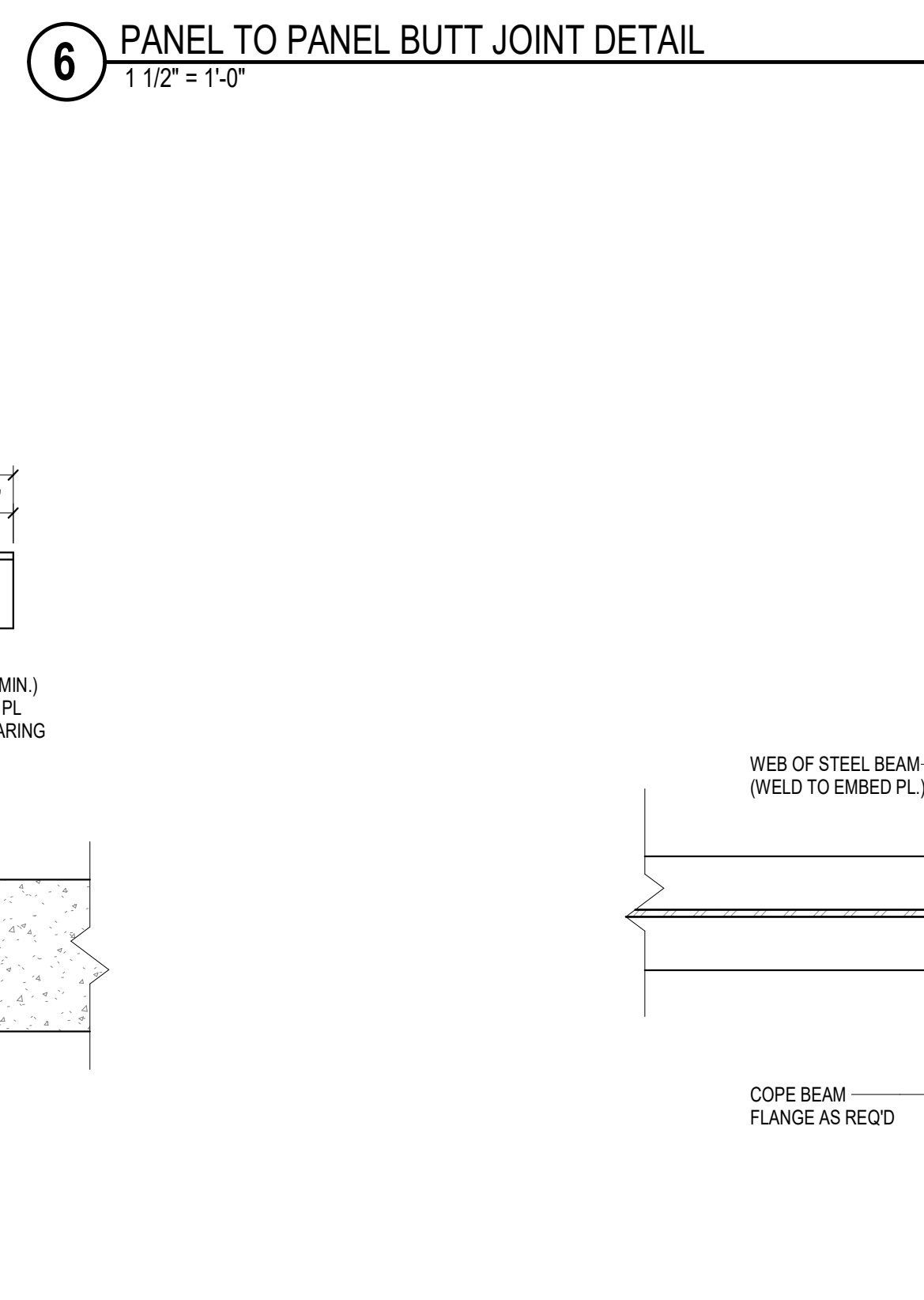
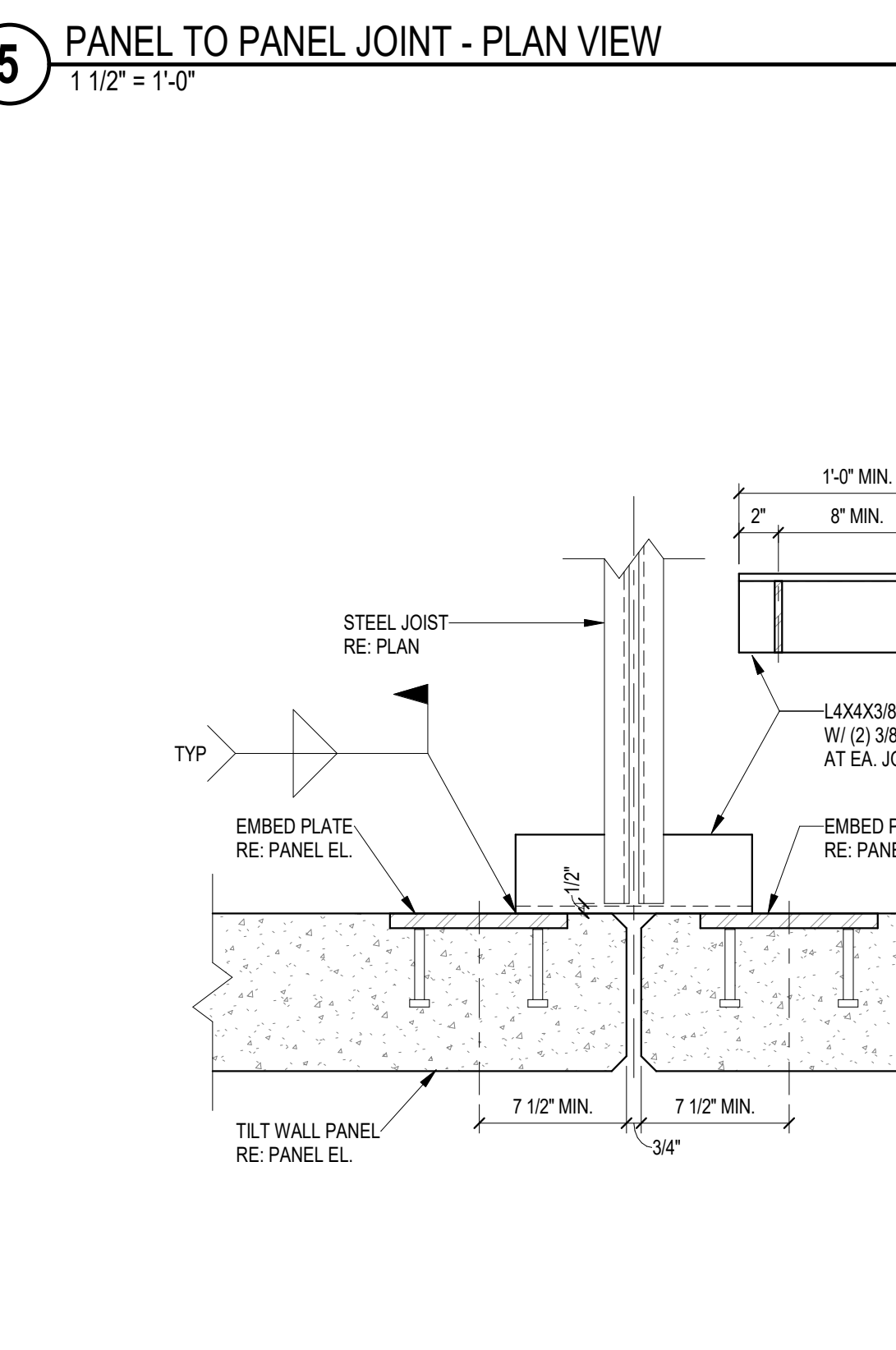
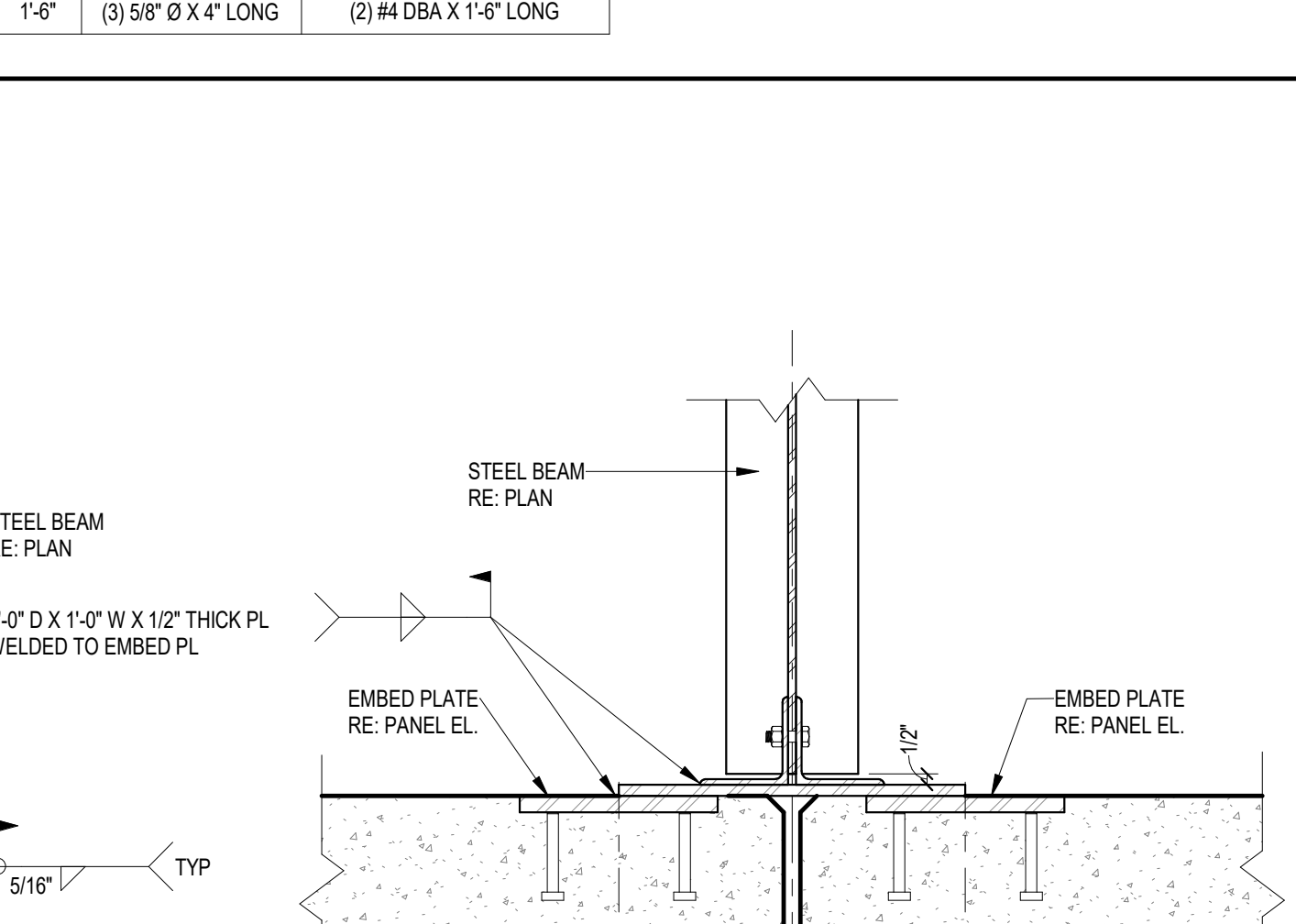
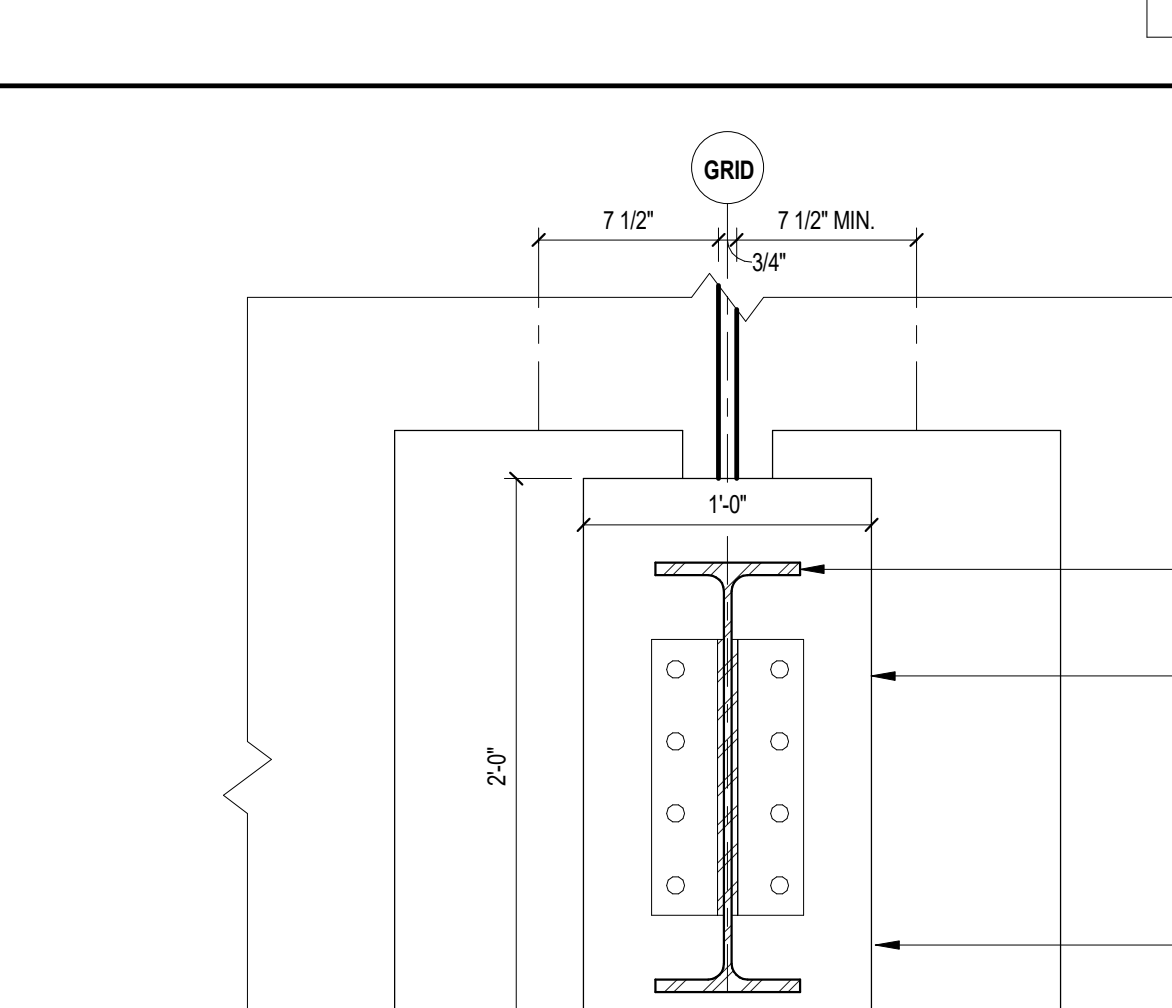
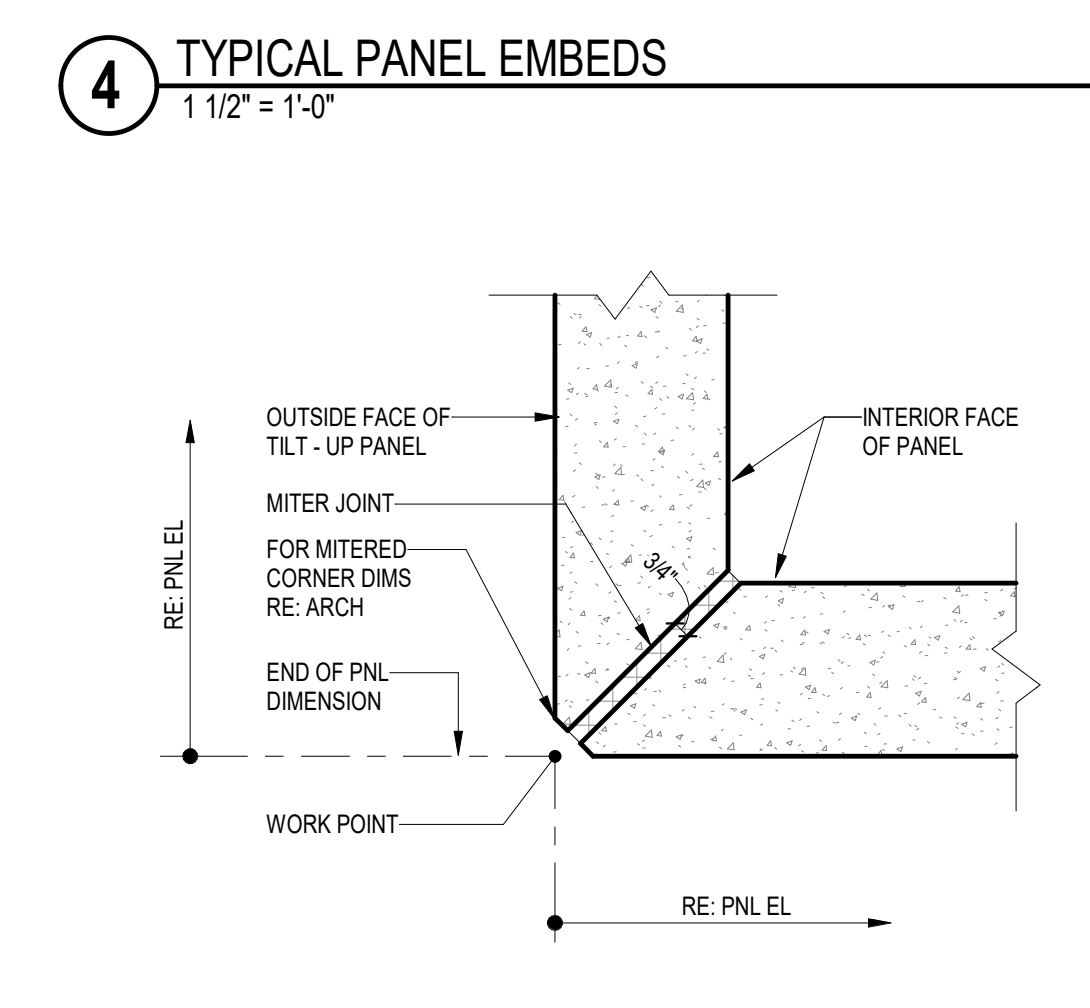
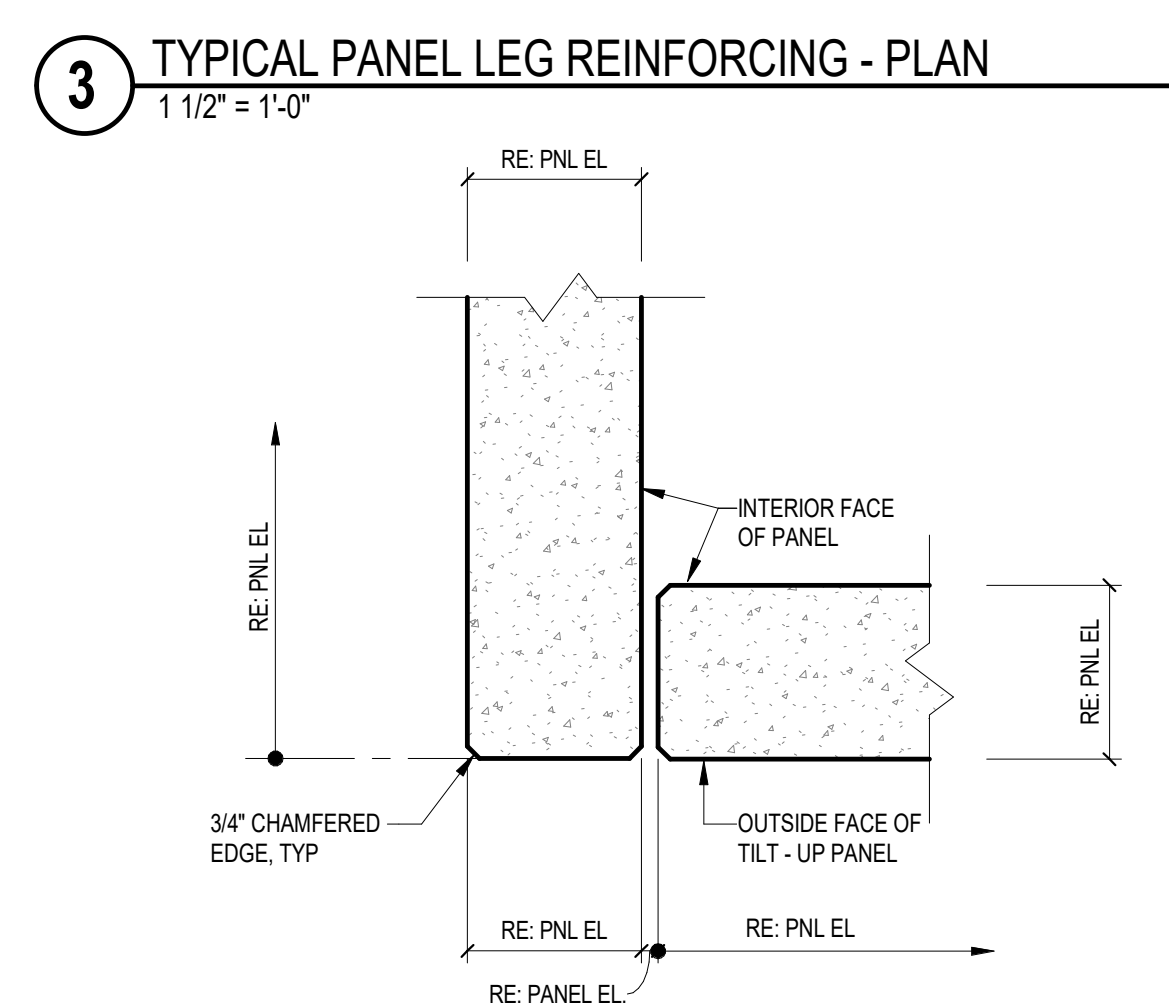
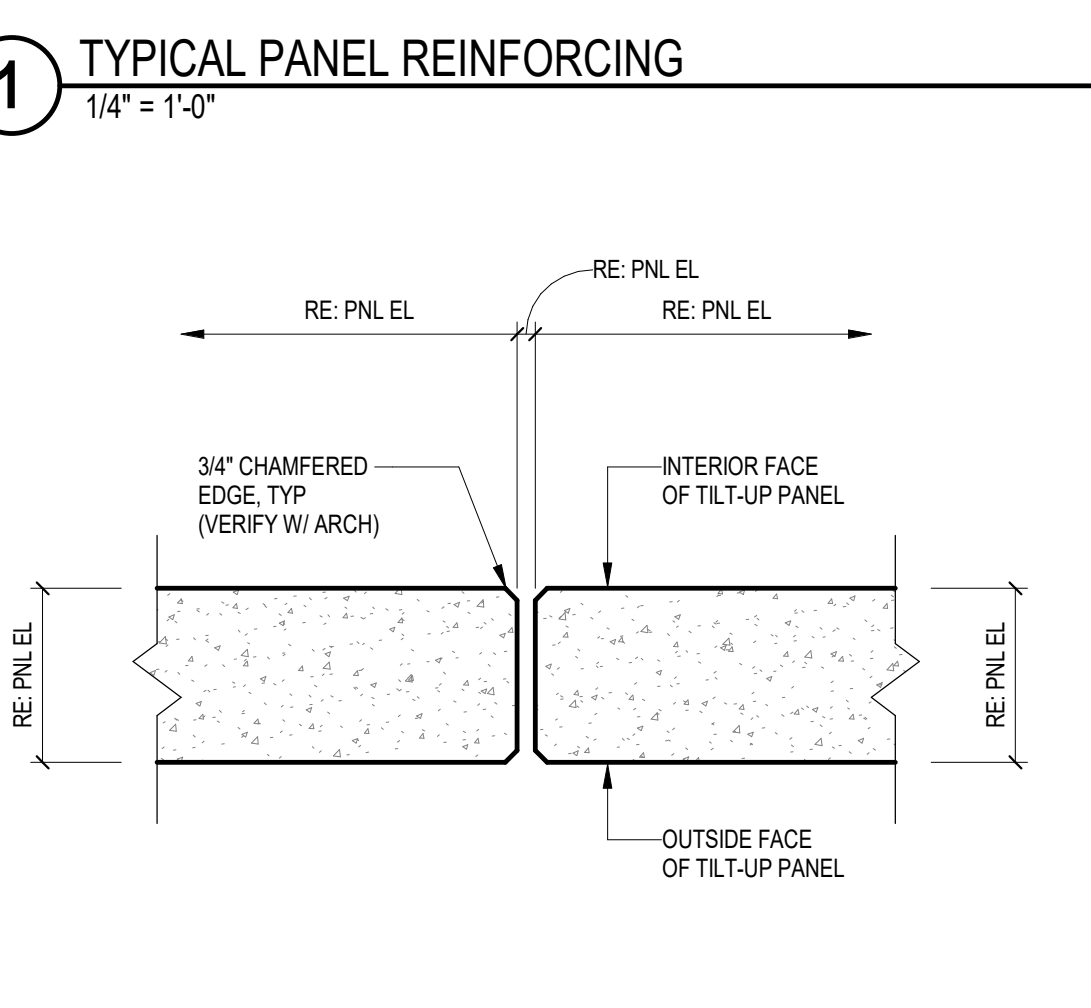
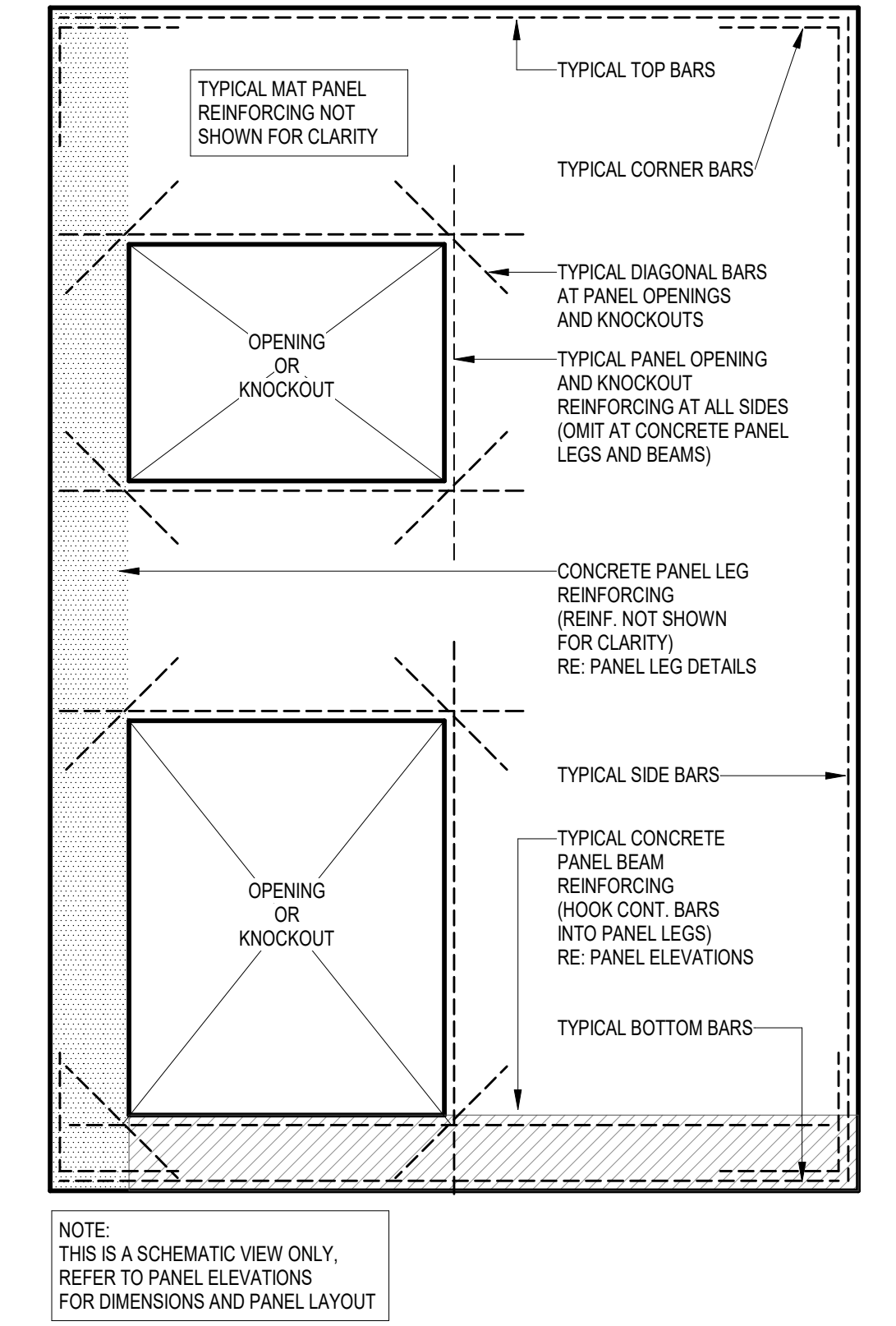
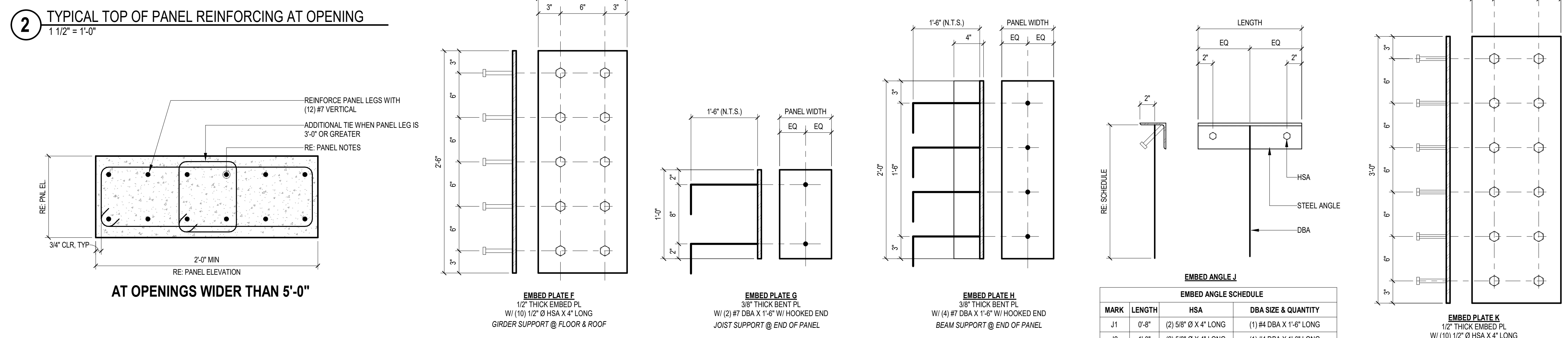
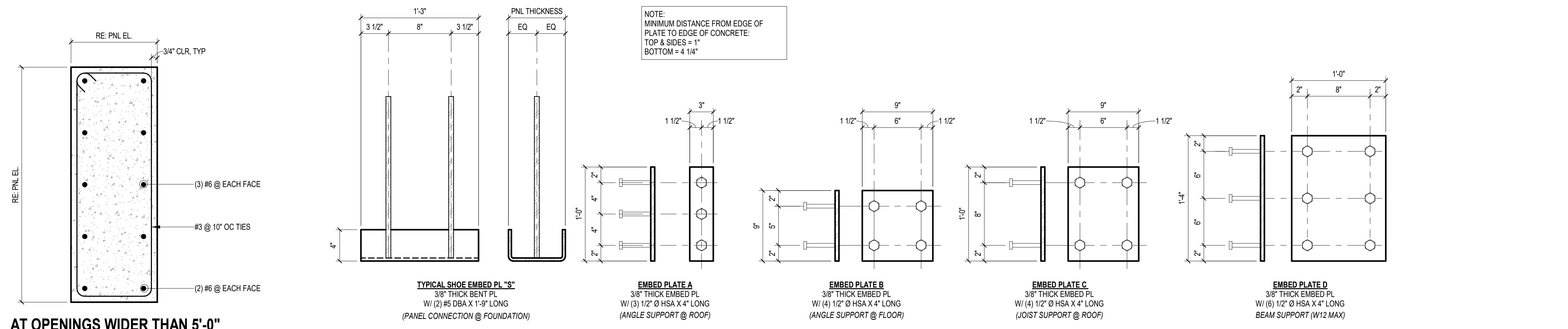
Issue Log:	No.	Description	Date
	1	100%CD	01.17.2024

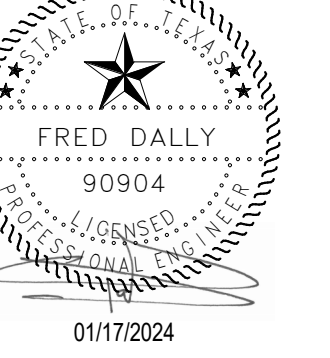
Revisions:	No.	Description	Date
	1	Revision 1	Date 1

TYPICAL TILT WALL  
DETAILS

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**S503**





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Checked: SJ  
Scale: AS NOTED

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Revisions:

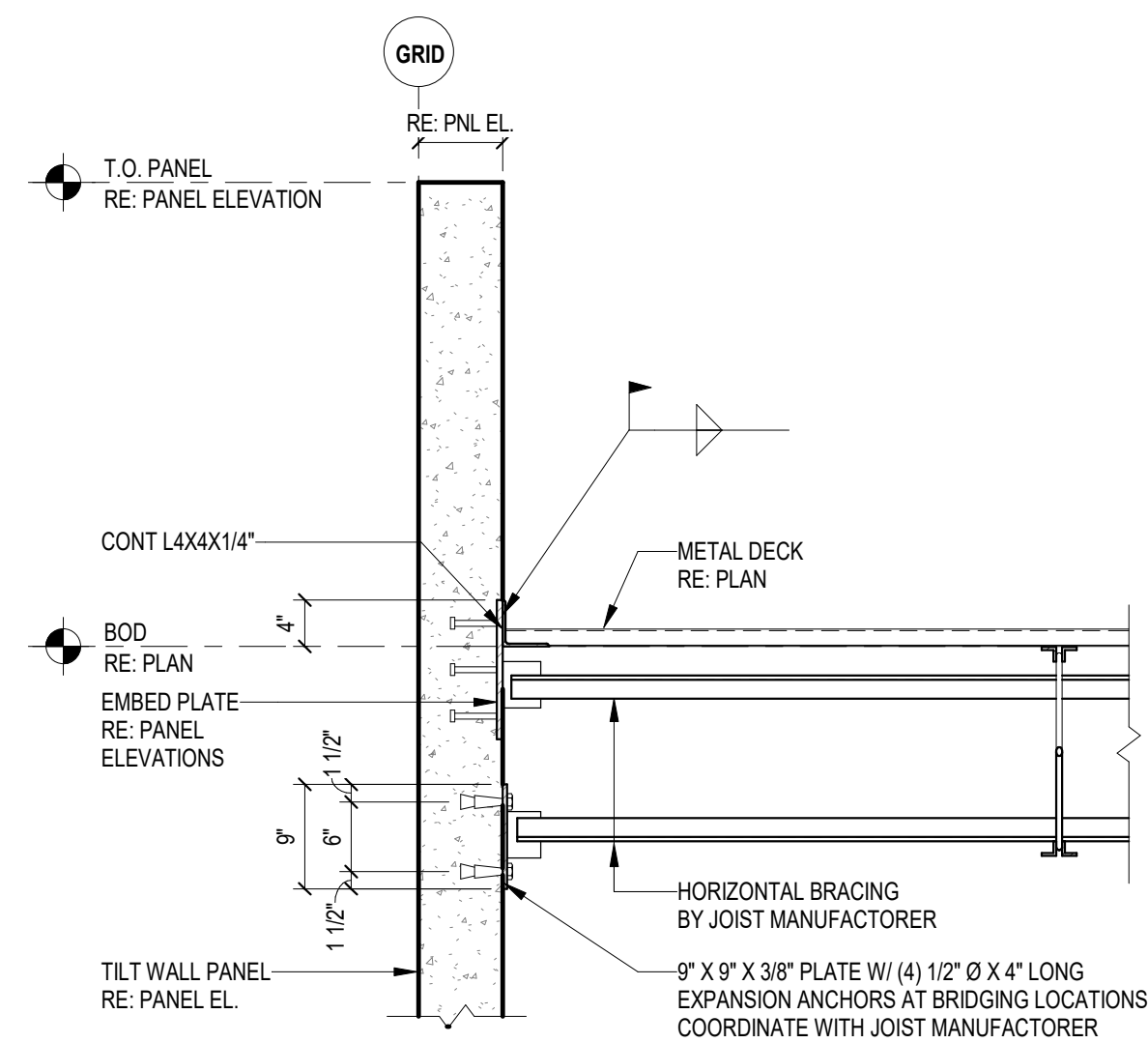
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TILT WALL ROOF  
FRAMING DETAILS

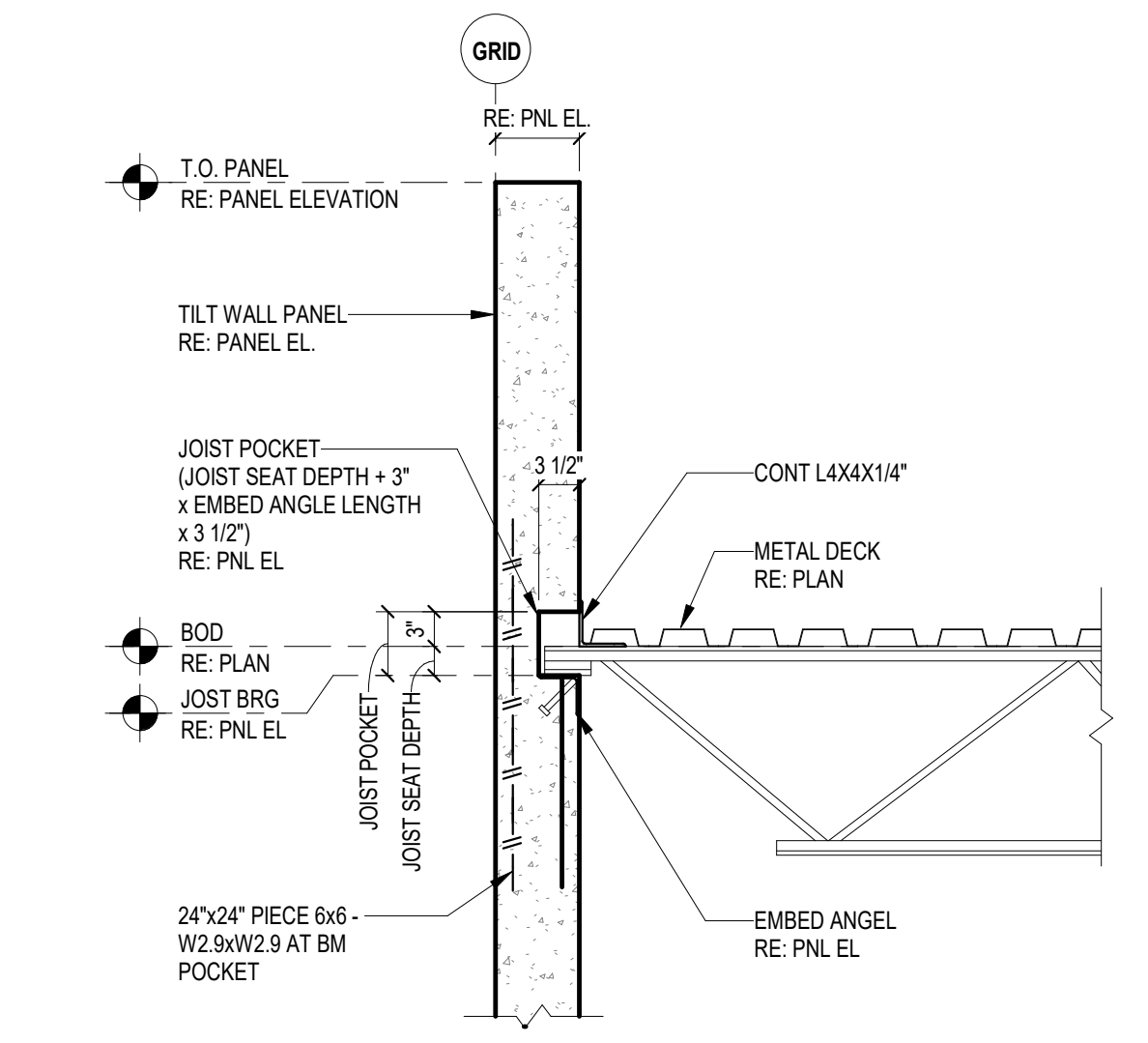
S504

**Dally**  
+ ASSOCIATES

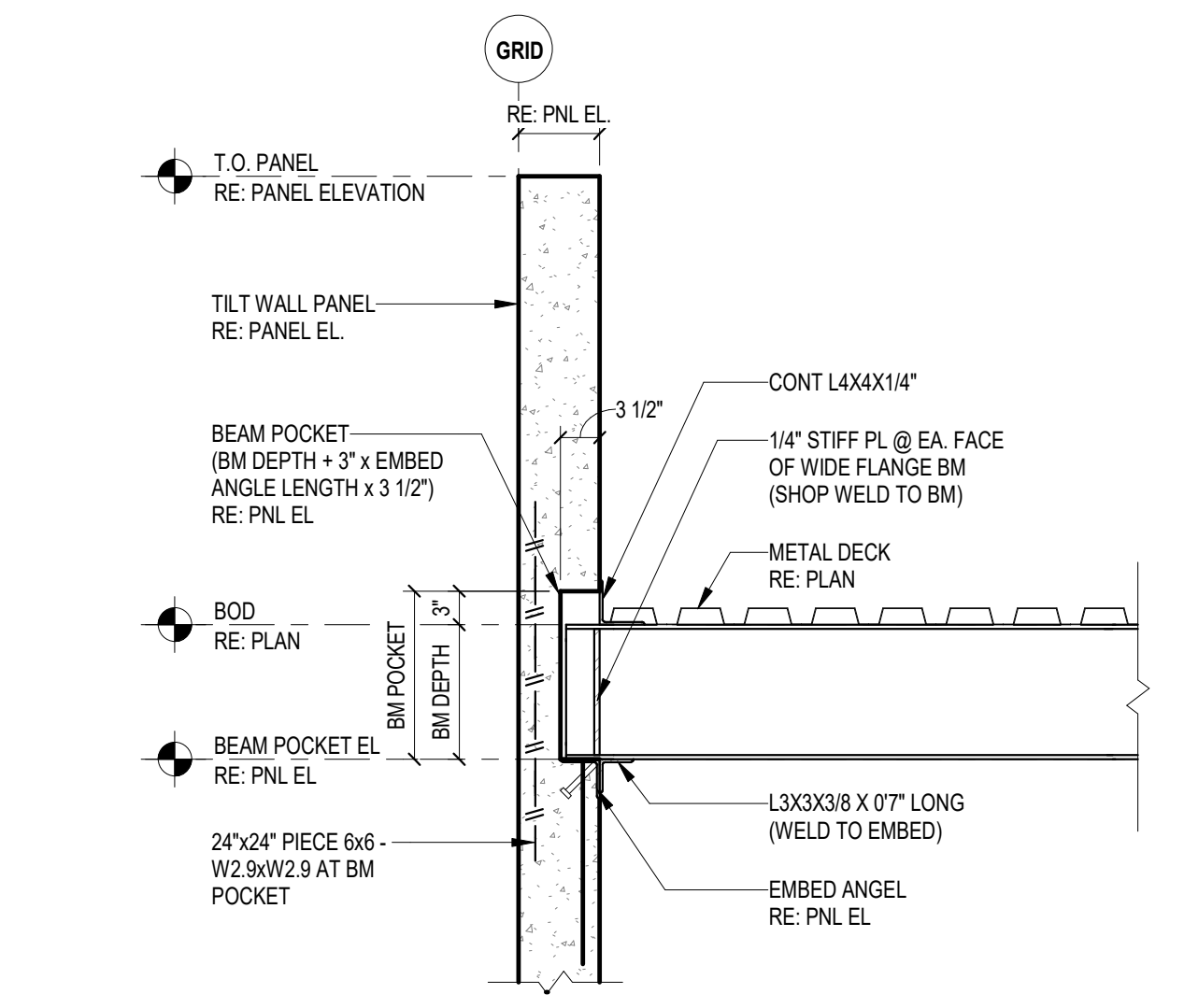
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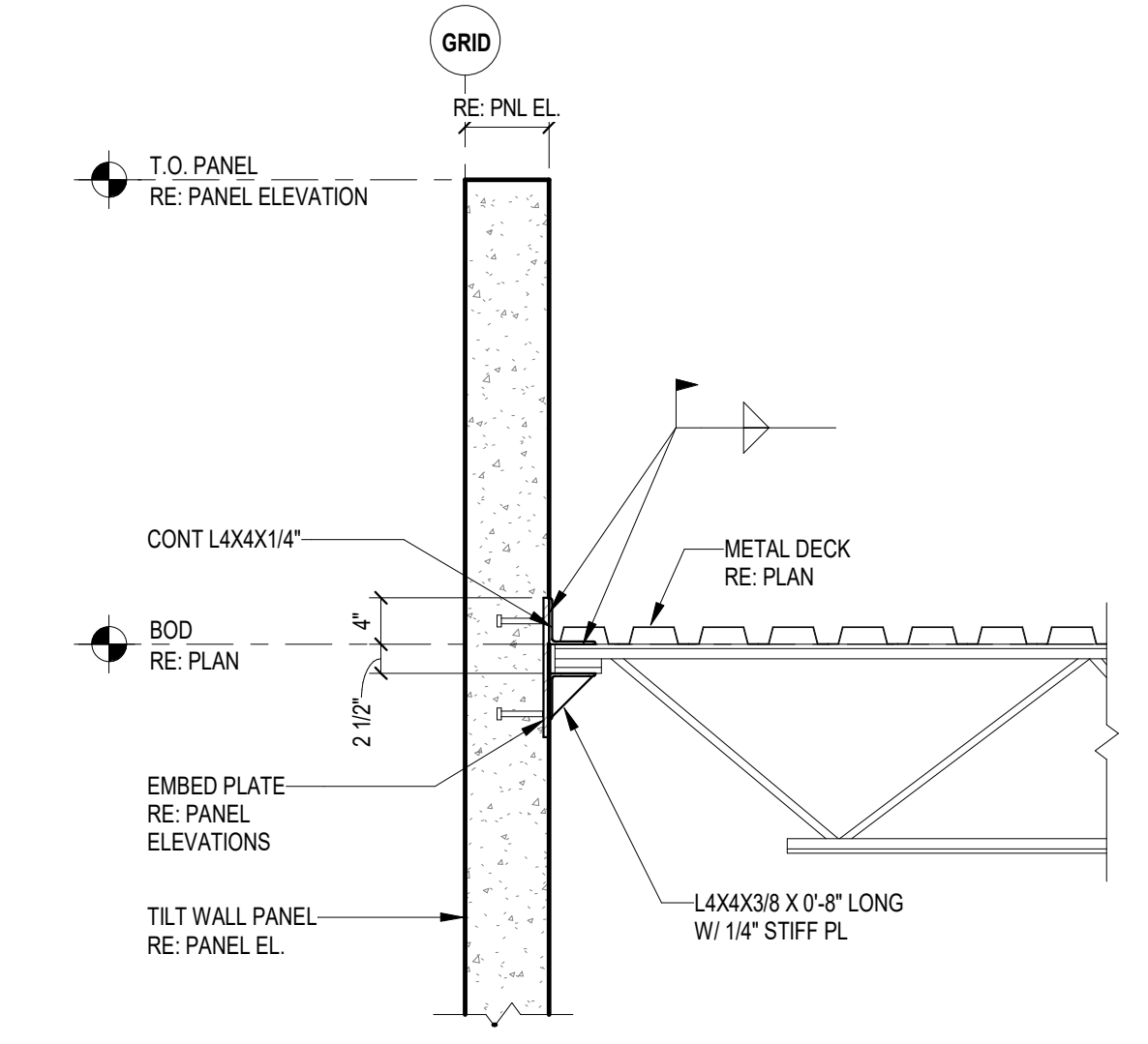
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3/4" = 1'-0"



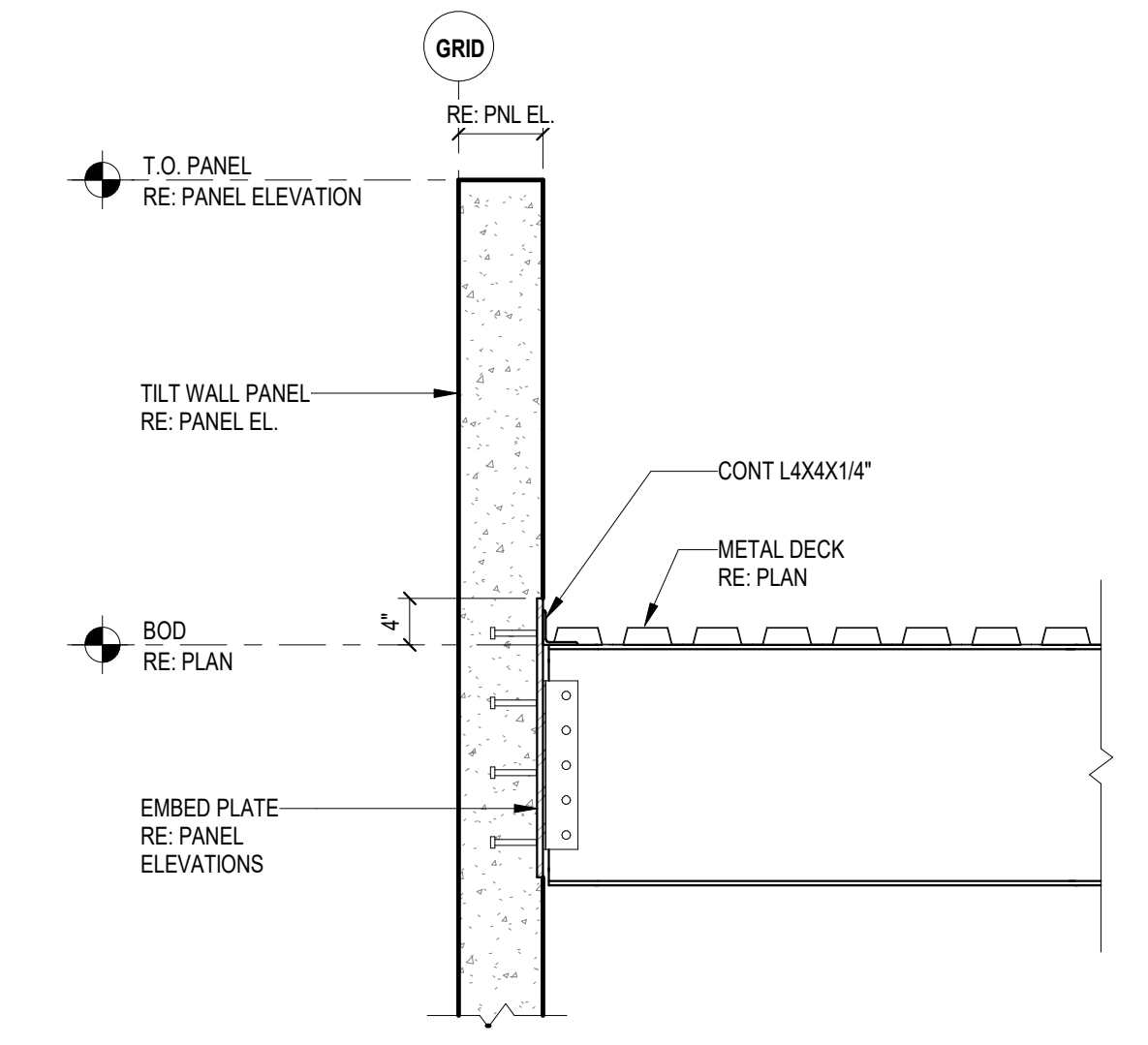
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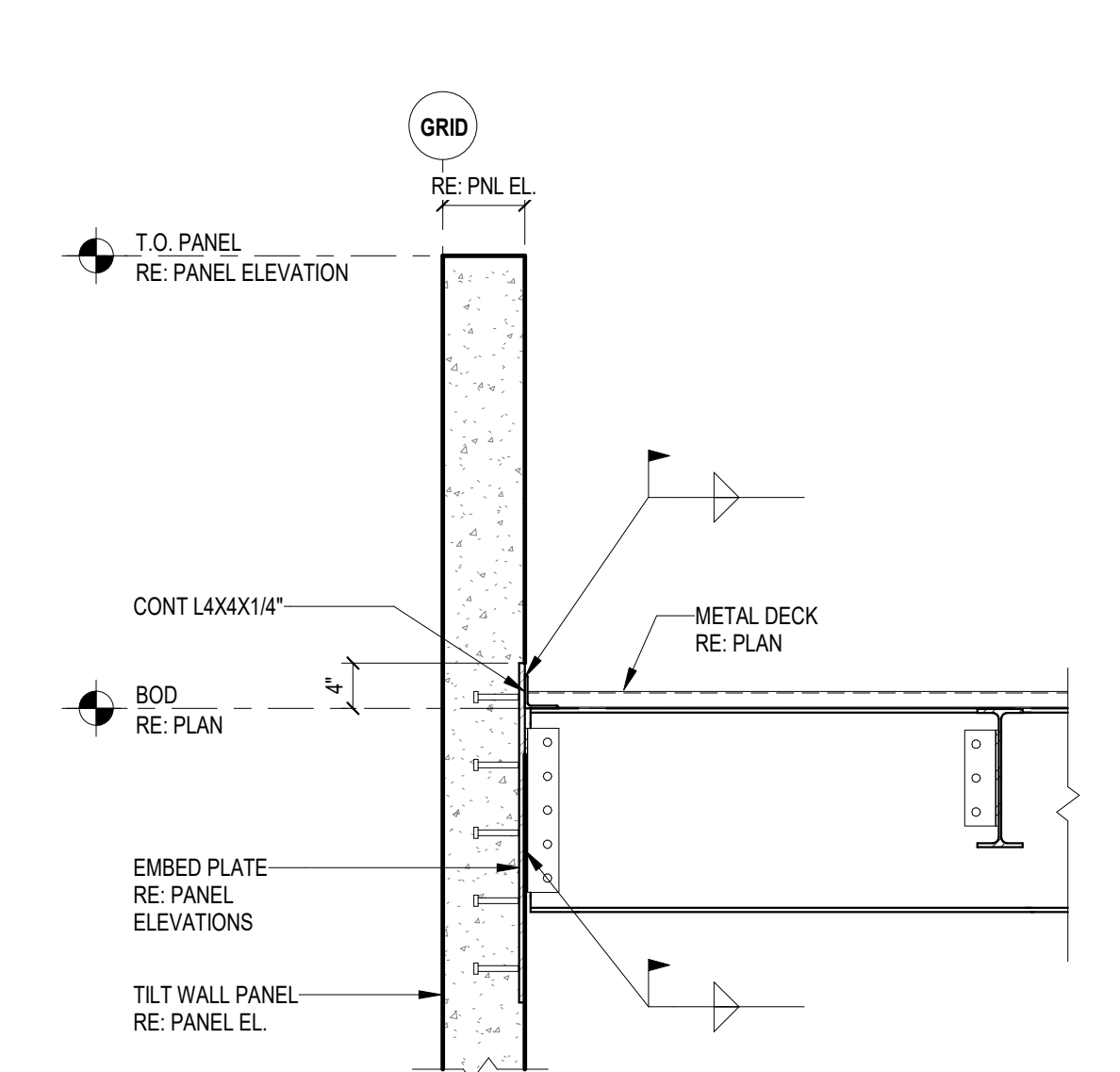
3 SECTION  
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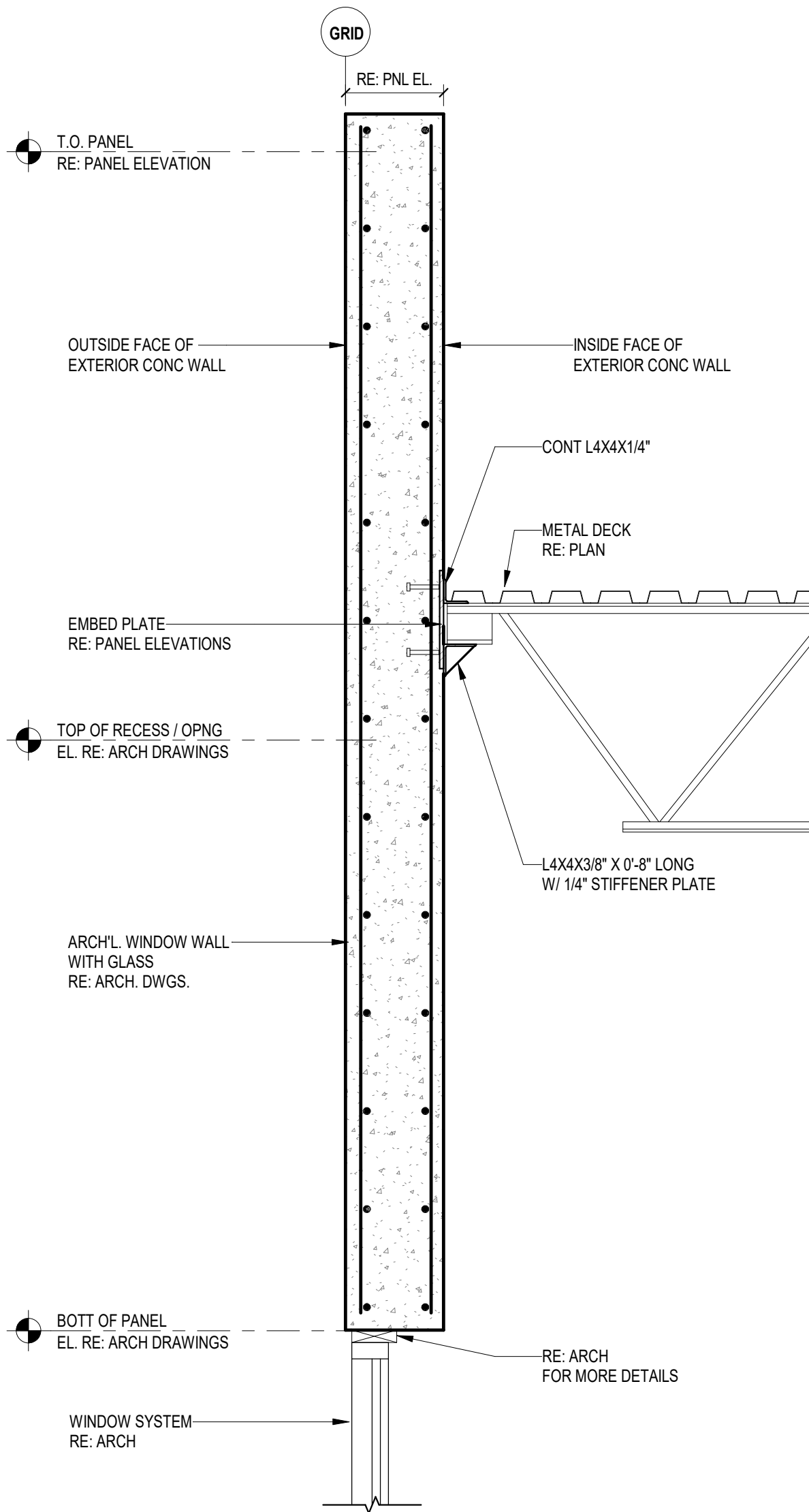
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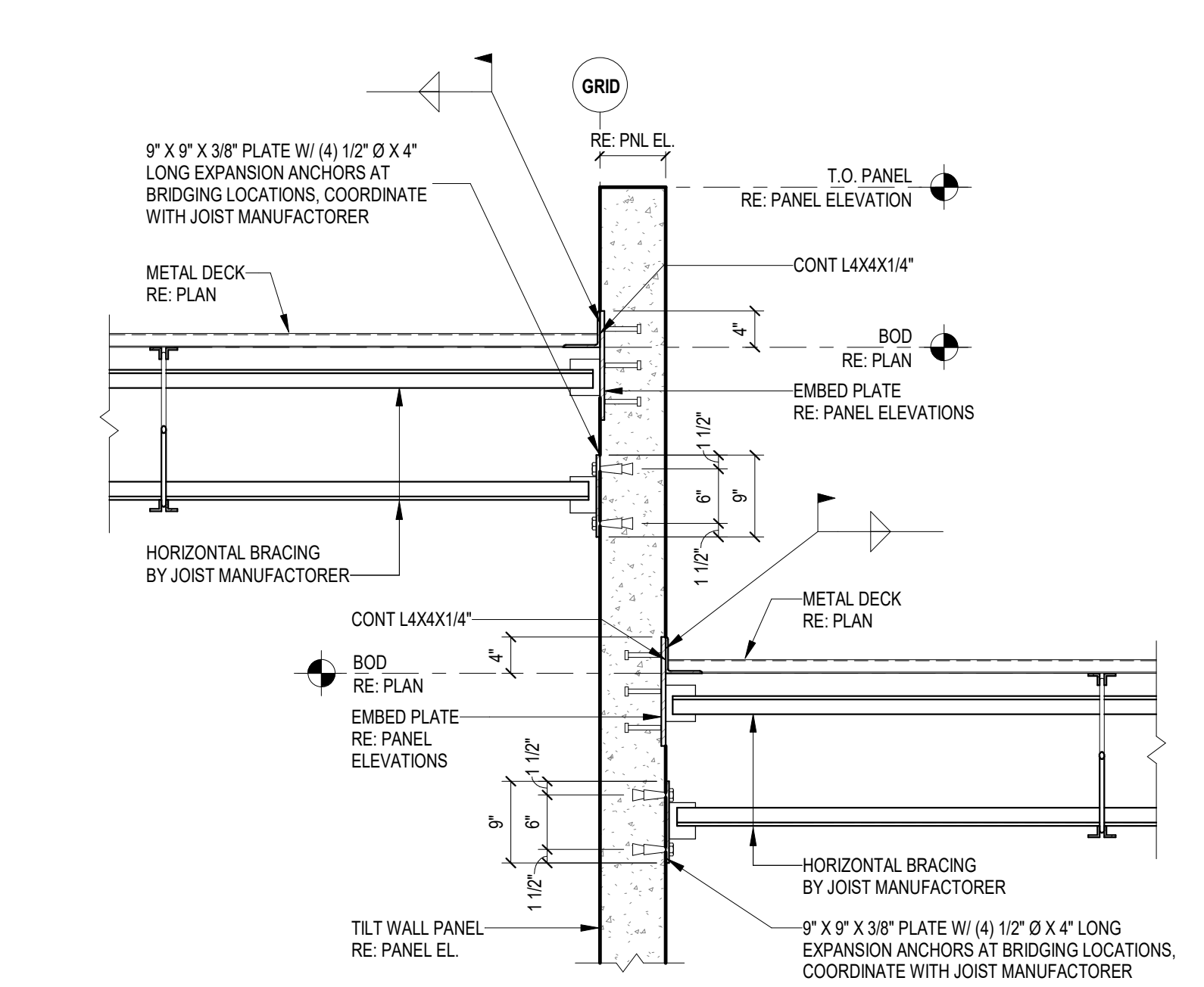
5 SECTION  
3/4" = 1'-0"



6 SECTION  
3/4" = 1'-0"



7 SECTION AT WINDOW  
3/4" = 1'-0"



8 SECTION  
3/4" = 1'-0"





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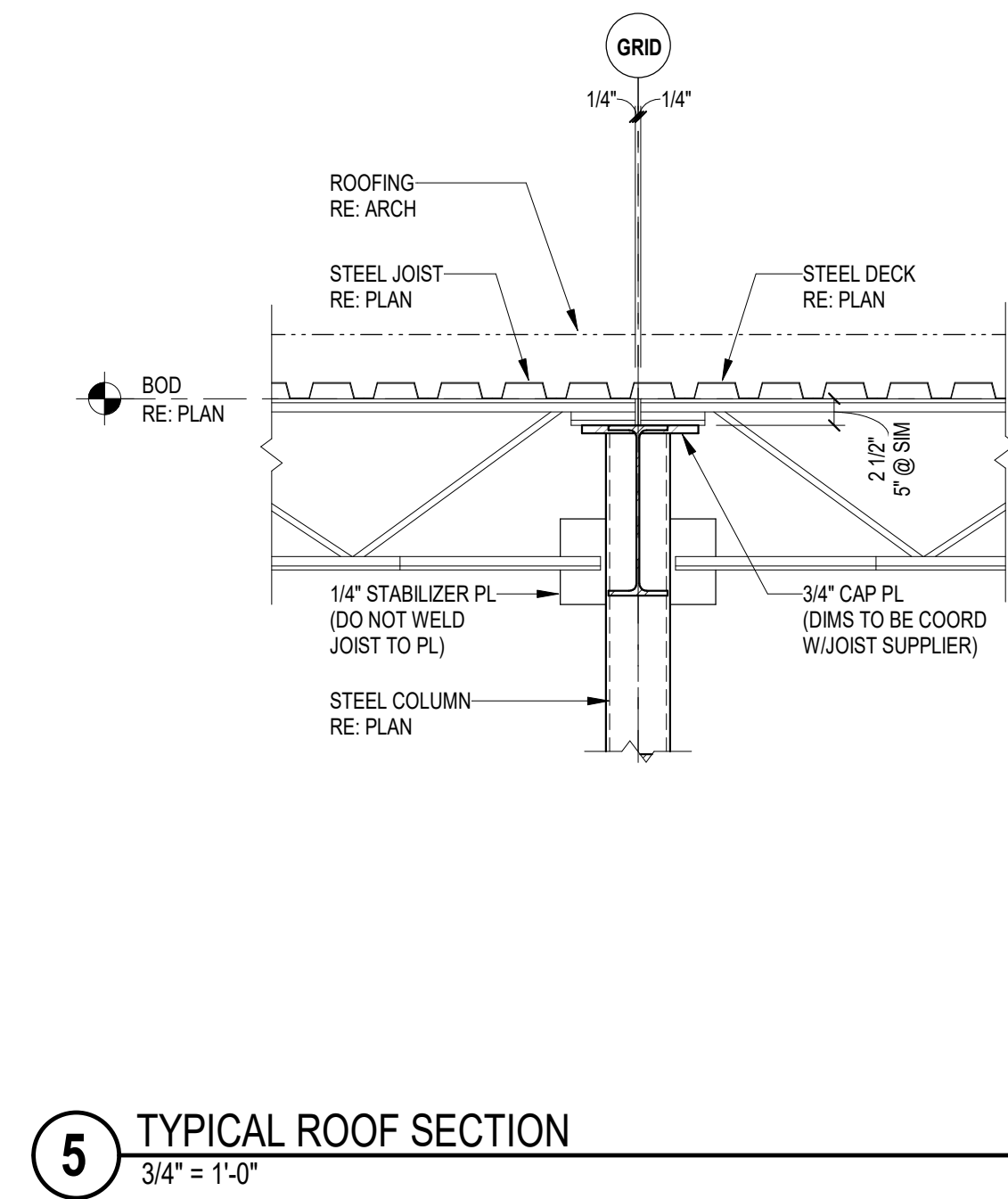
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**ROOF FRAMING  
DETAILS**

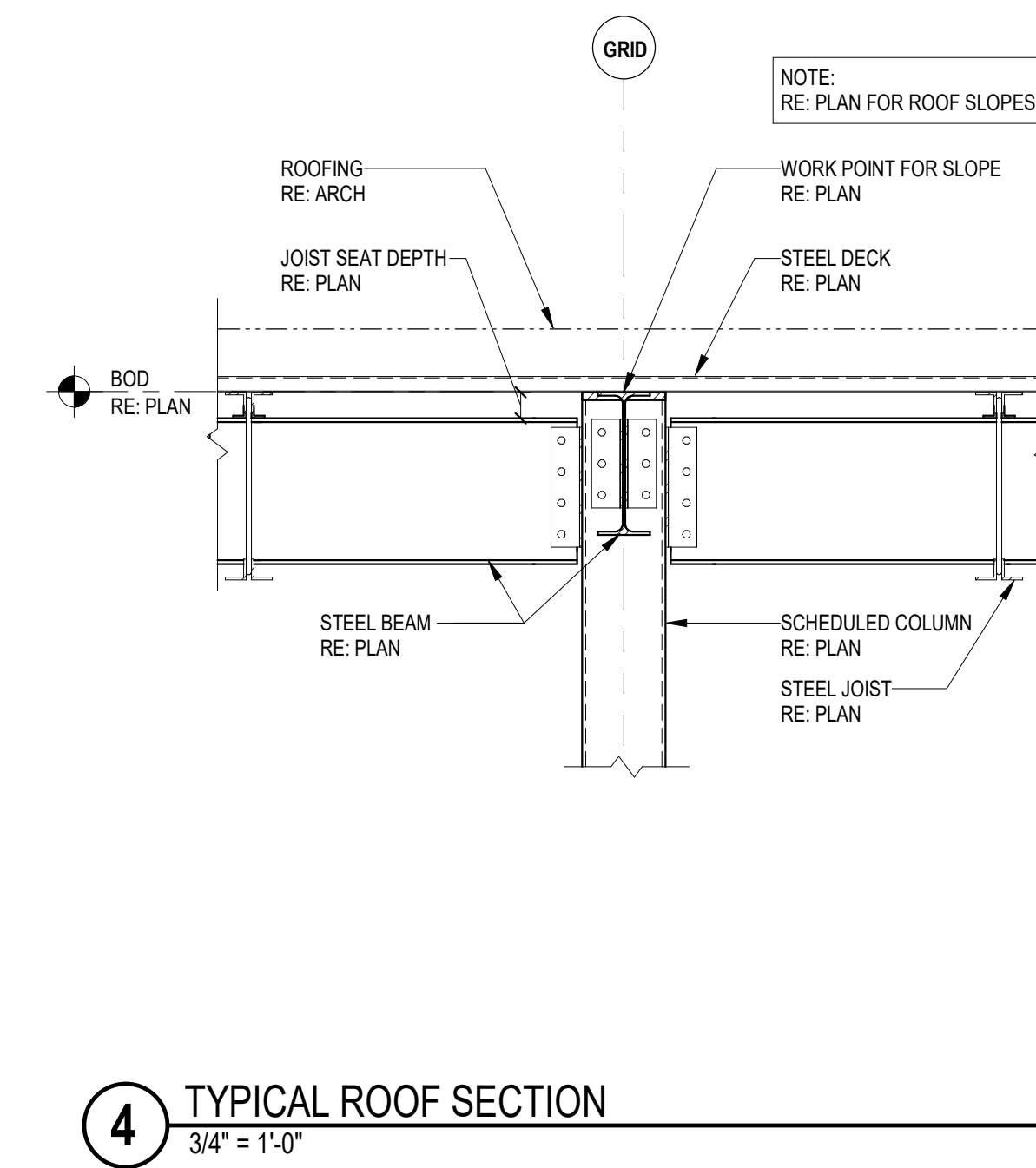


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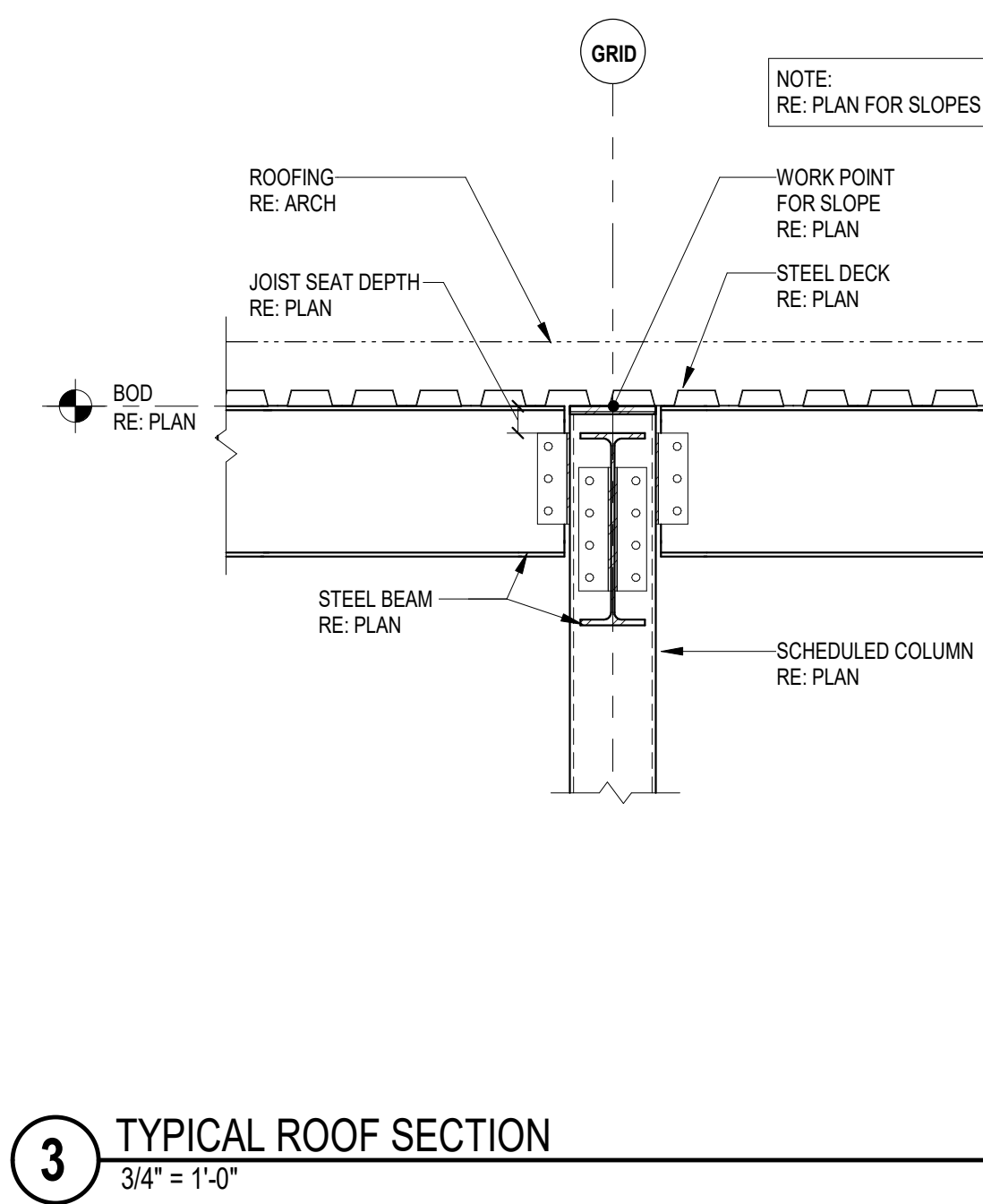
**S505**



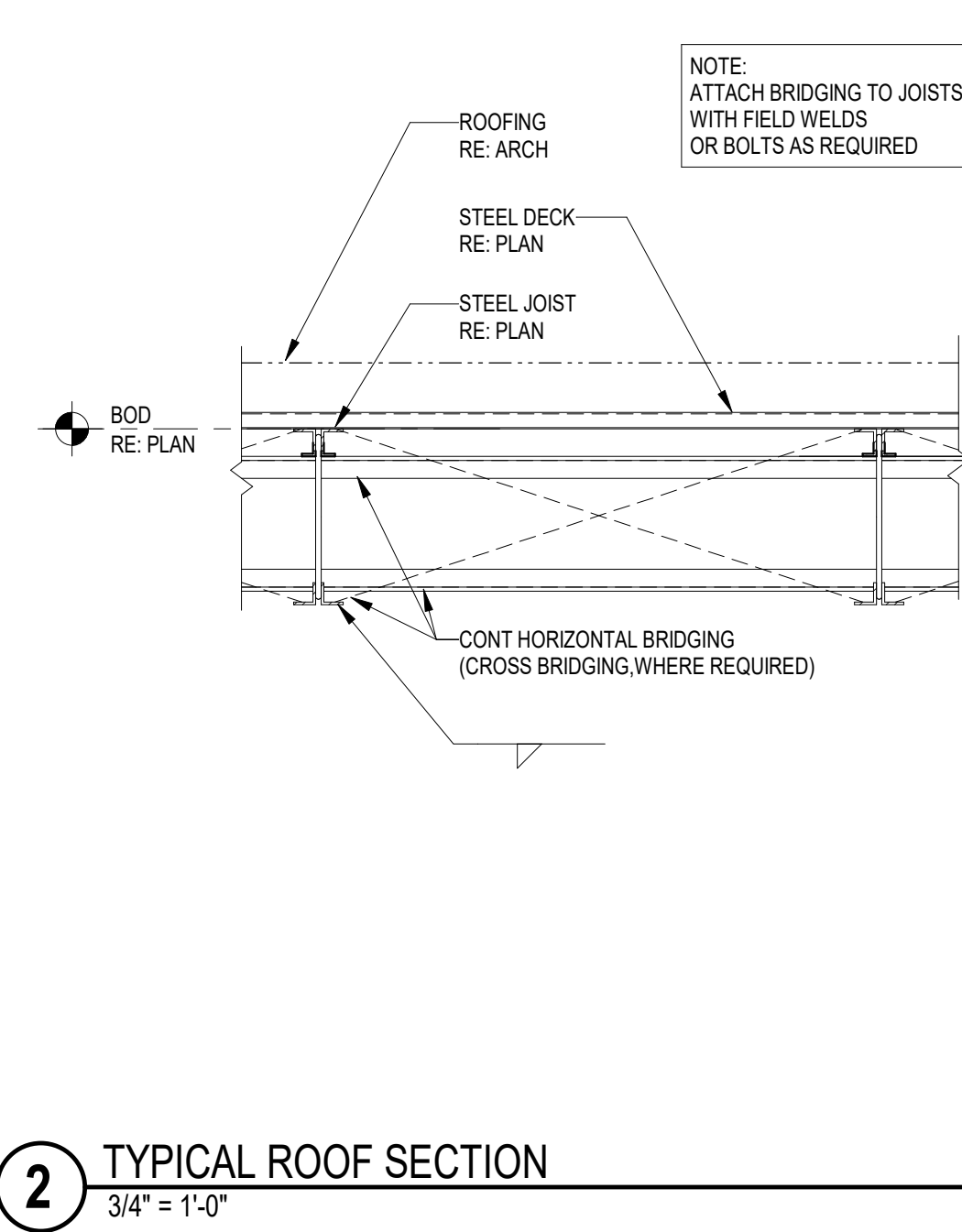
**5** TYPICAL ROOF SECTION  
3/4" = 1'-0"



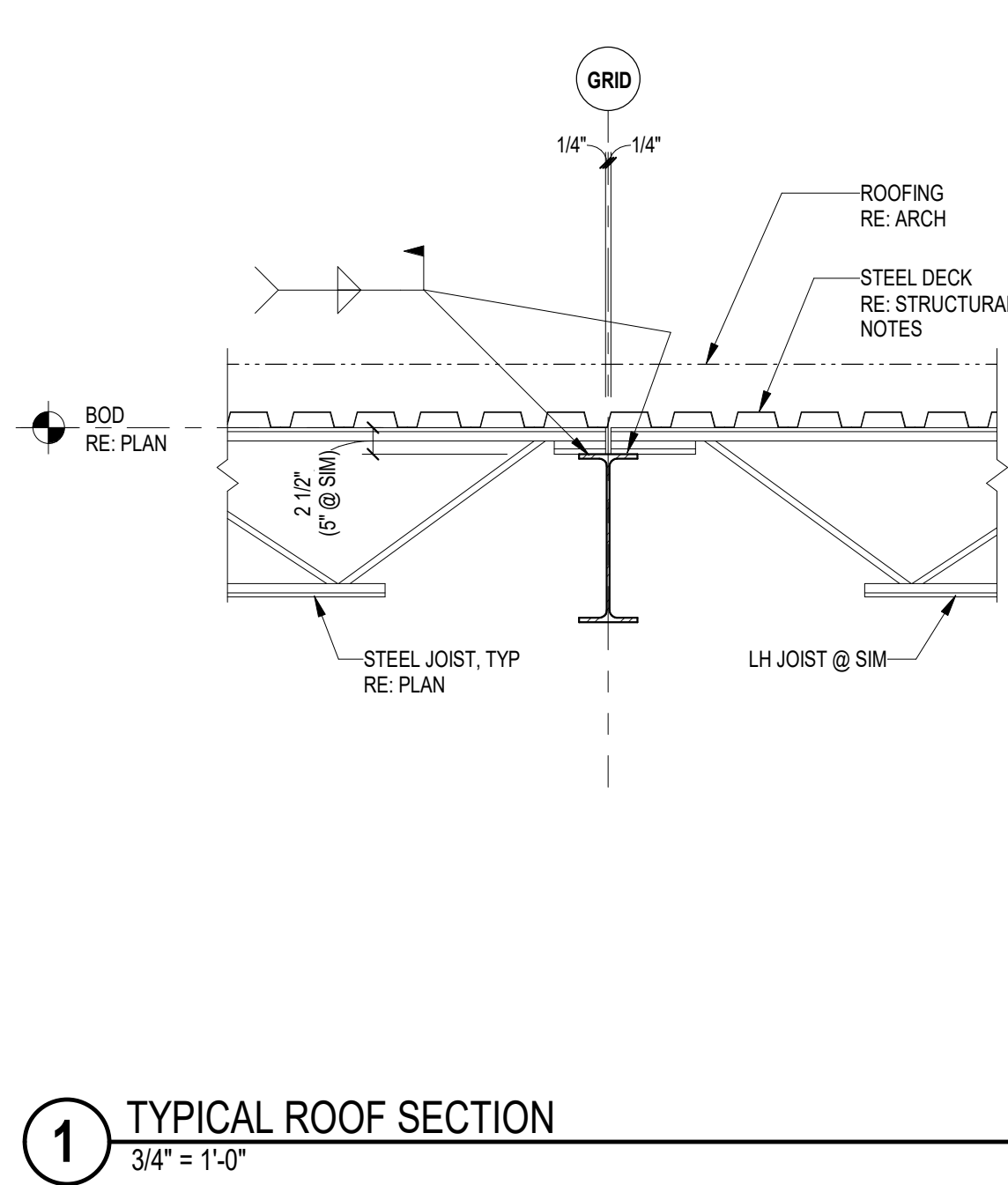
**4** TYPICAL ROOF SECTION  
3/4" = 1'-0"



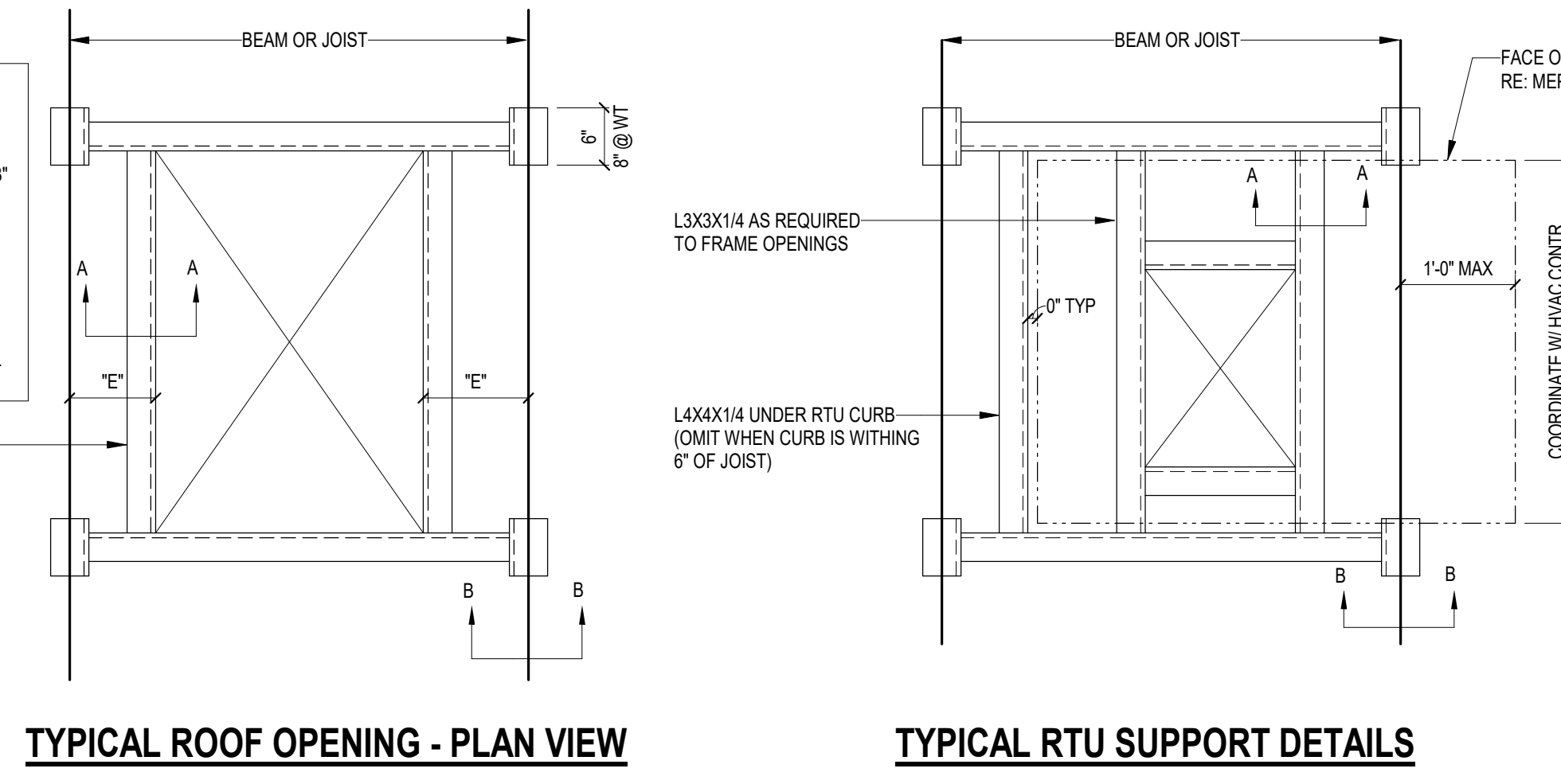
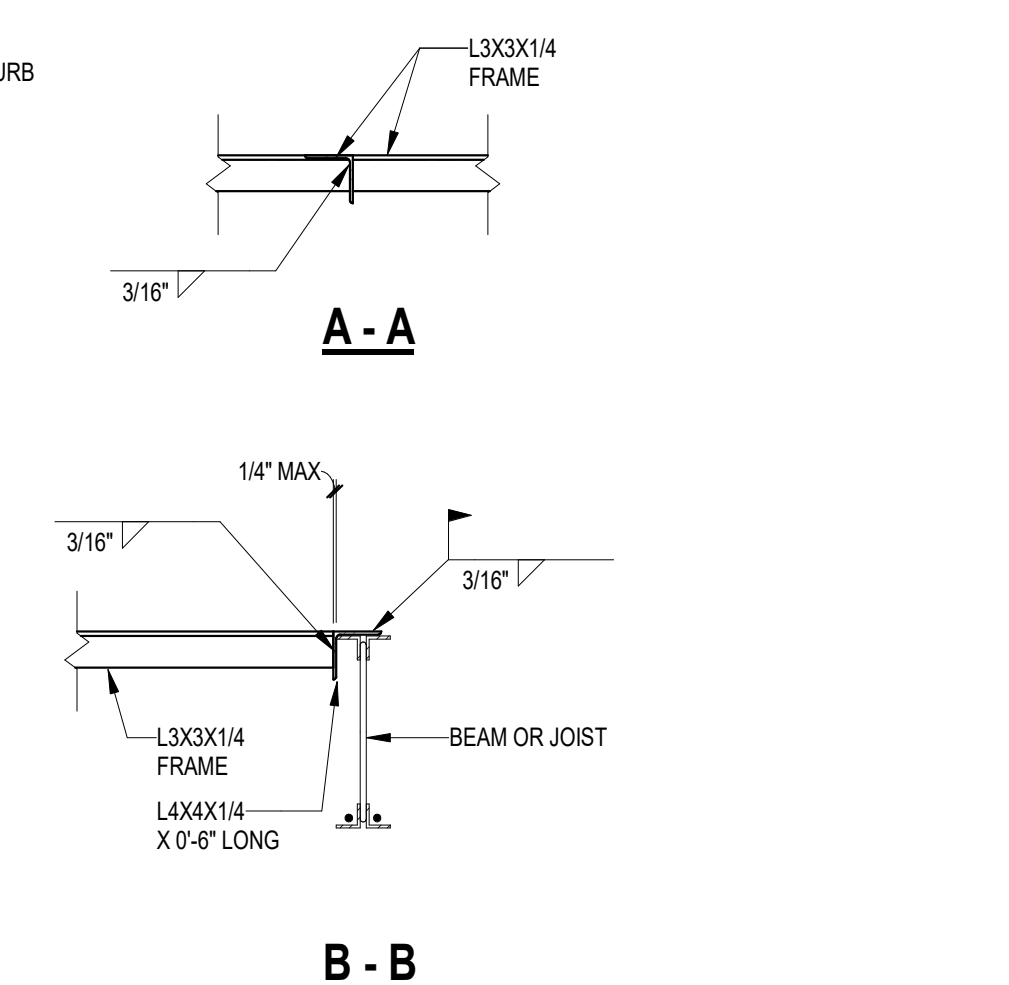
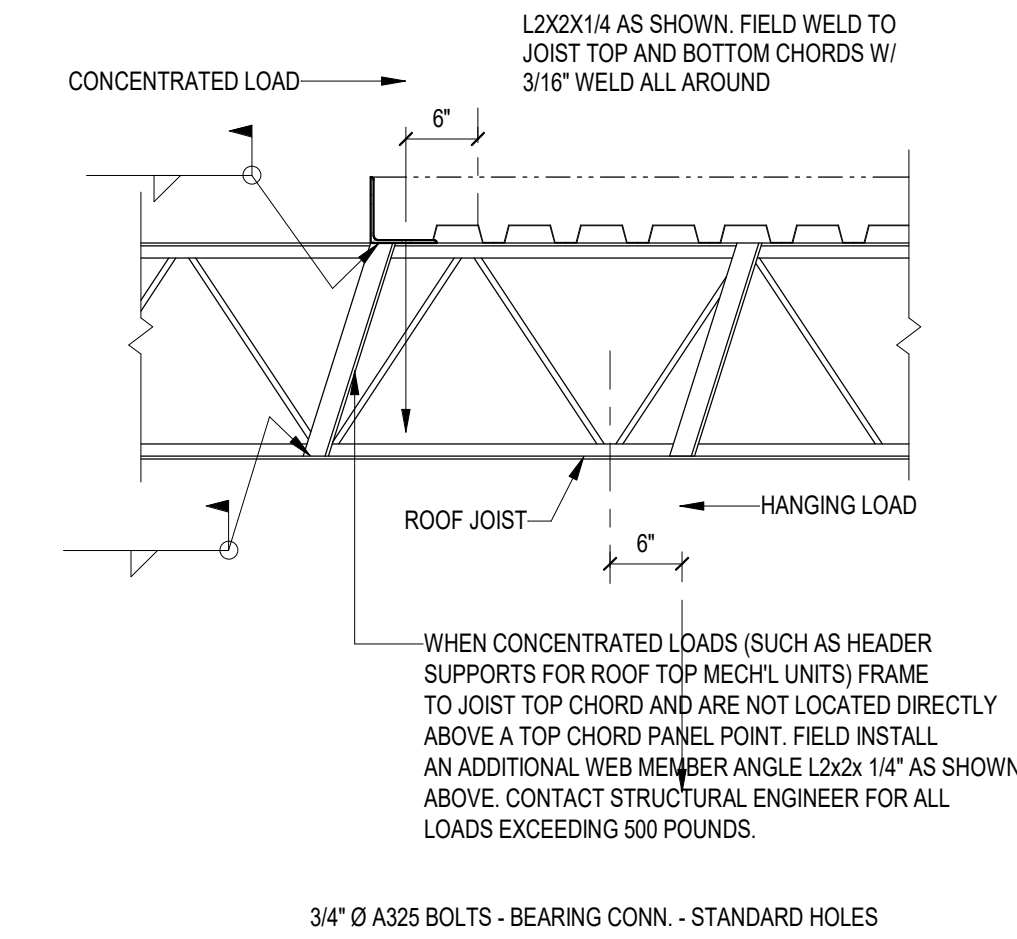
**3** TYPICAL ROOF SECTION  
3/4" = 1'-0"



**2** TYPICAL ROOF SECTION  
3/4" = 1'-0"



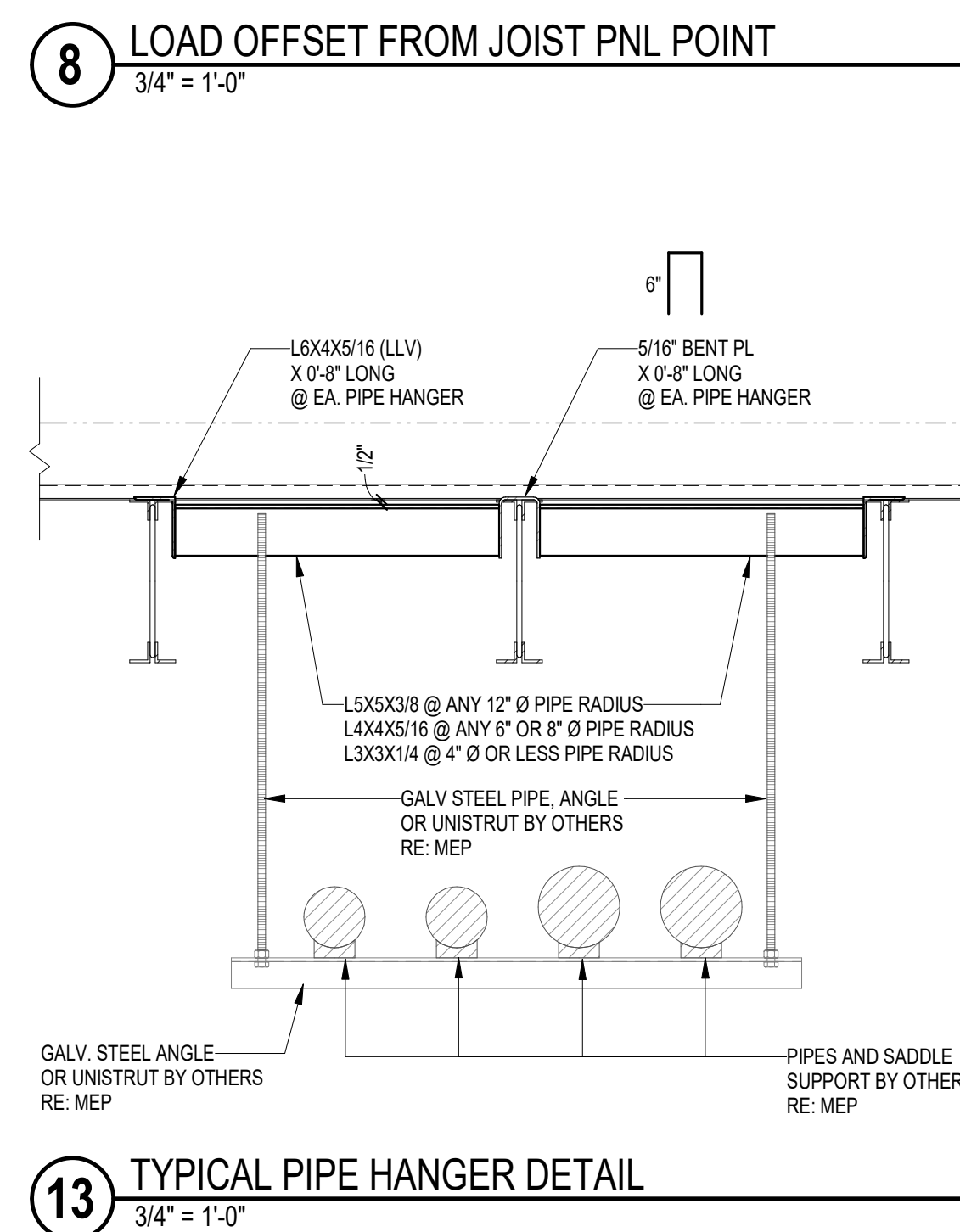
**1** TYPICAL ROOF SECTION  
3/4" = 1'-0"



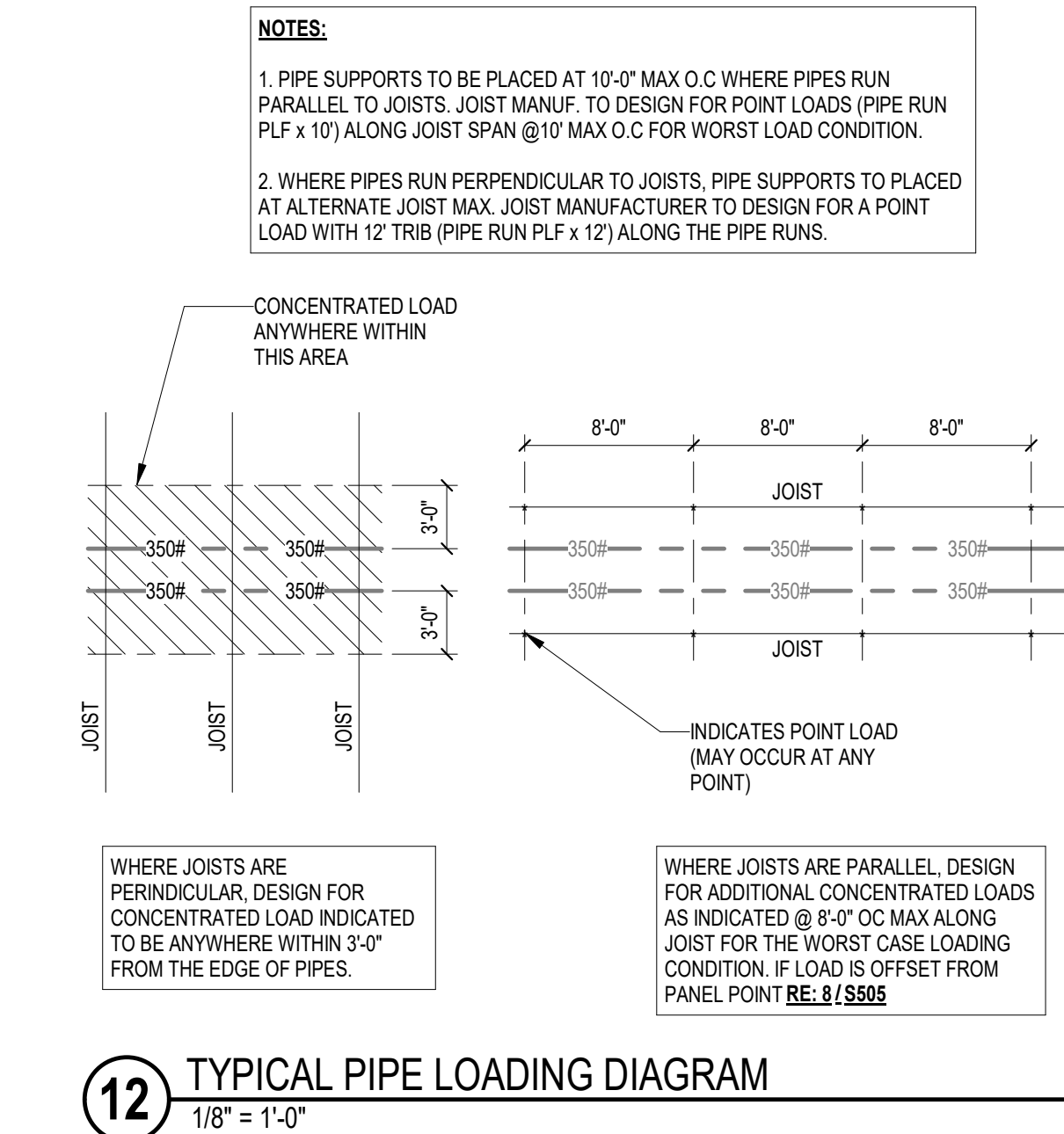
TYPICAL ROOF OPENING - PLAN VIEW

TYPICAL RTU SUPPORT DETAILS

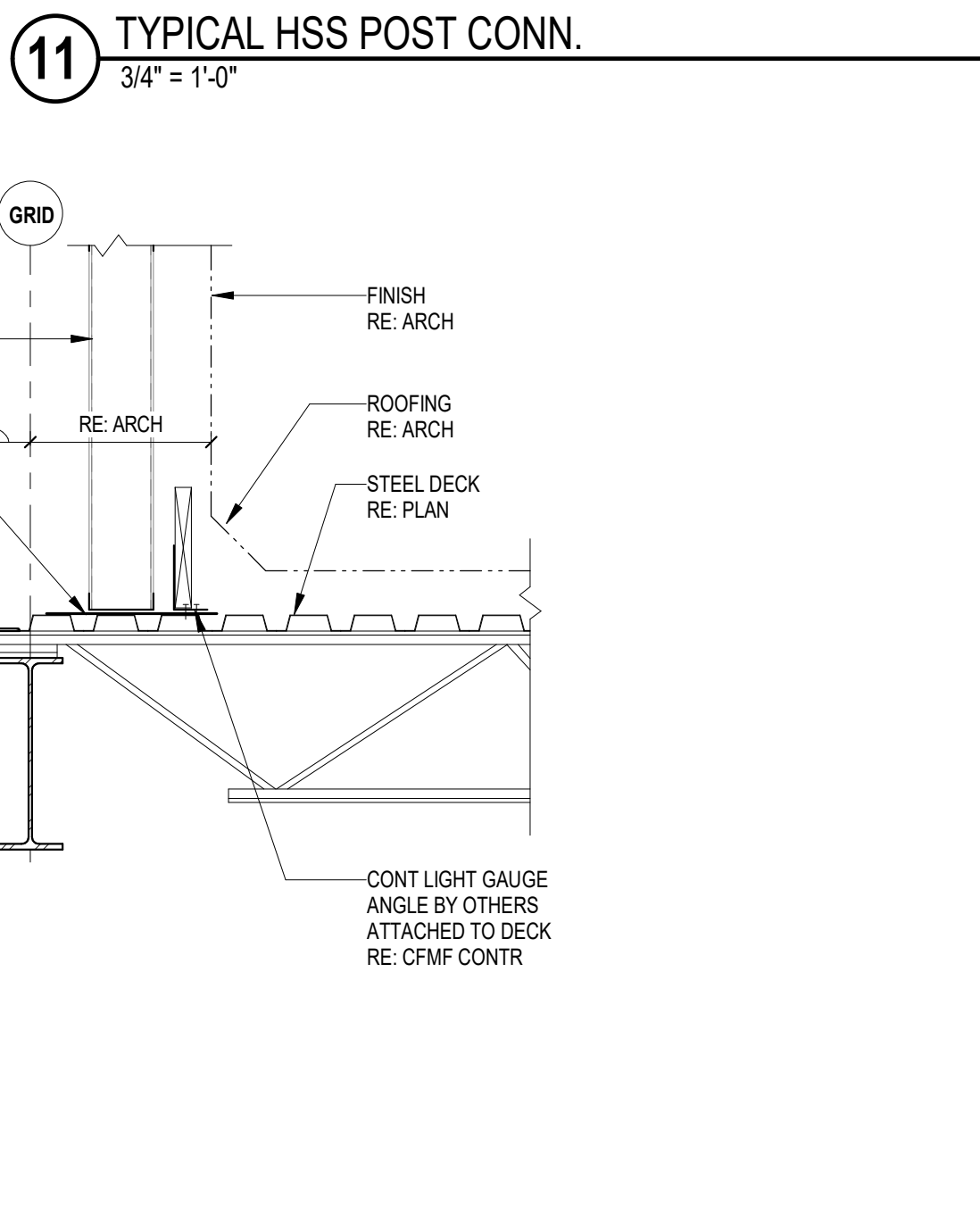
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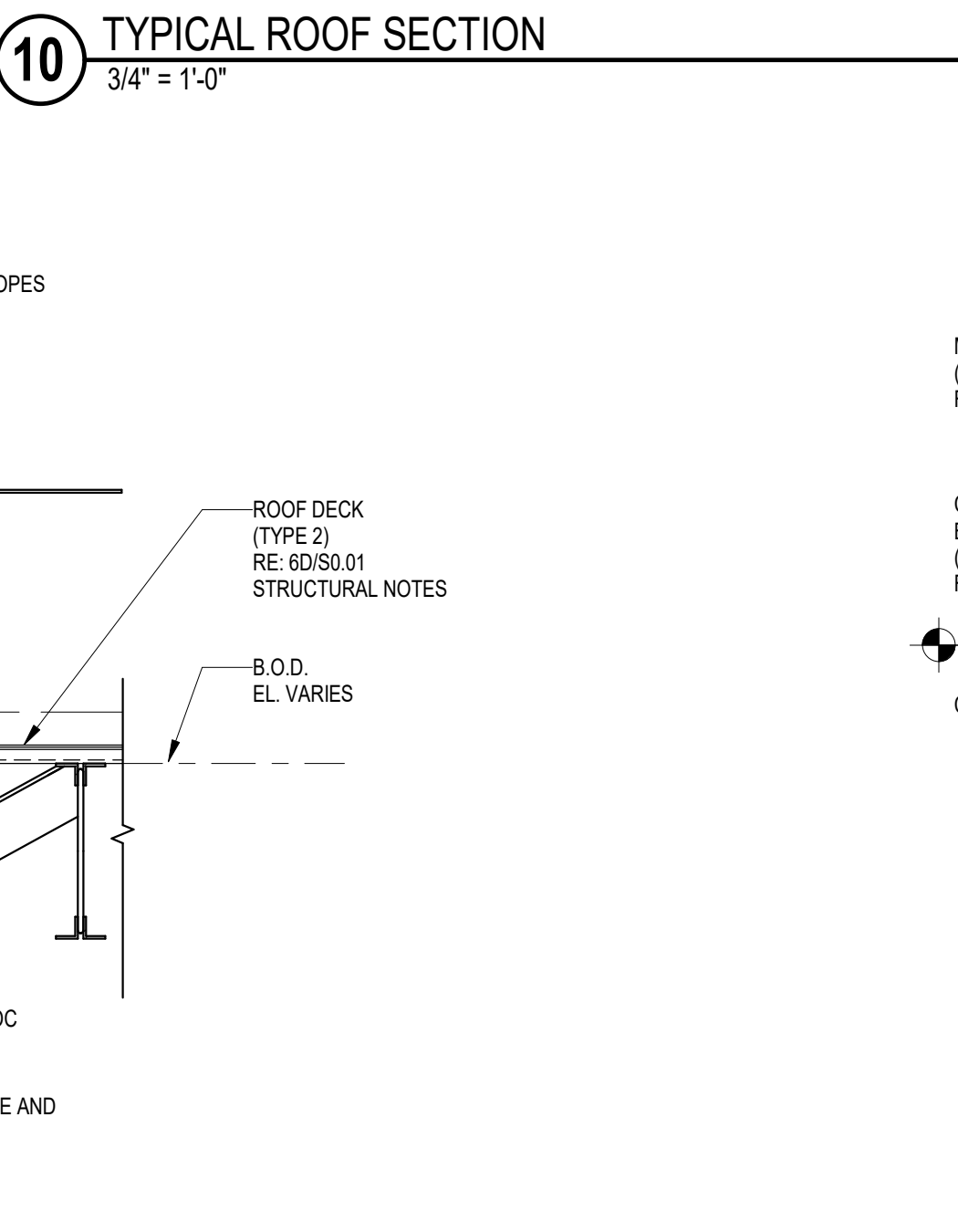
**13** TYPICAL PIPE HANGER DETAIL  
3/4" = 1'-0"



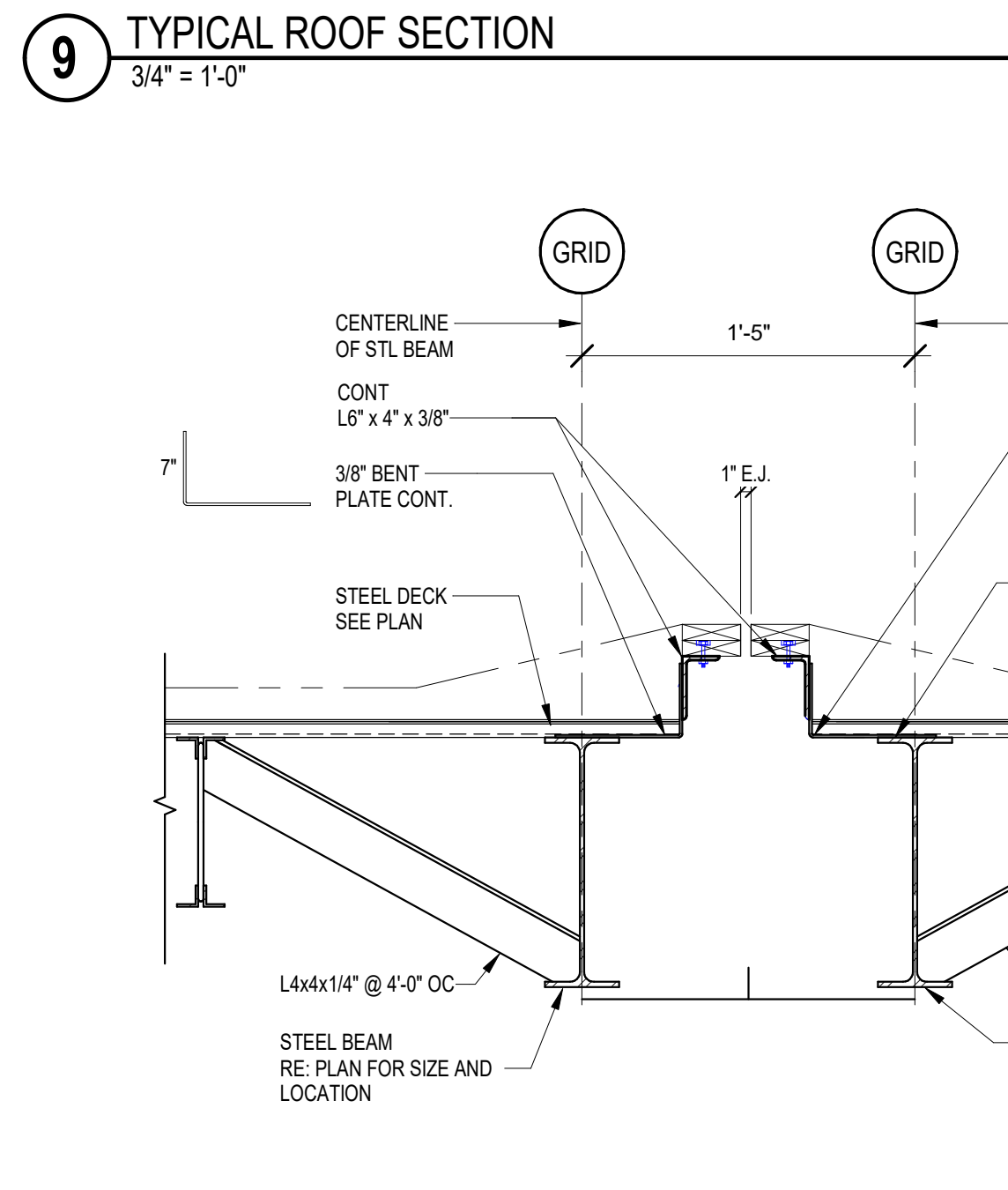
**12** TYPICAL PIPE LOADING DIAGRAM  
1/8" = 1'-0"



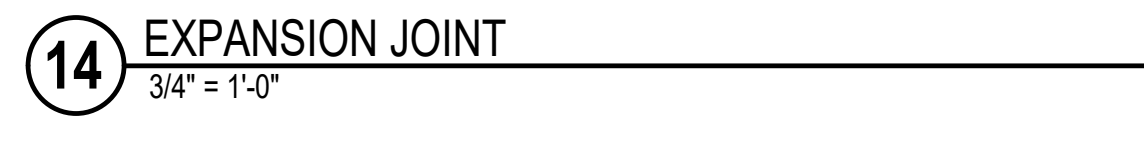
**11** TYPICAL HSS POST CONN.  
3/4" = 1'-0"



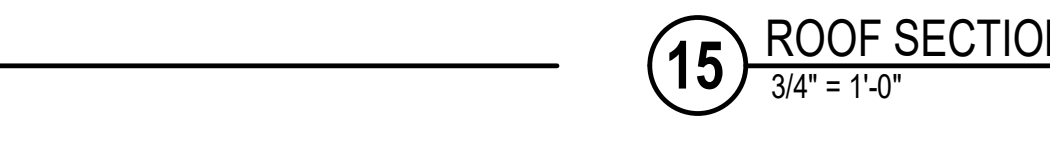
**7** TYPICAL ROOF SECTION  
3/4" = 1'-0"



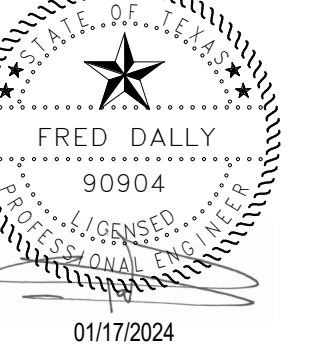
**6** TYPICAL ROOF SECTION  
3/4" = 1'-0"



**14** EXPANSION JOINT  
3/4" = 1'-0"



**15** ROOF SECTION  
3/4" = 1'-0"



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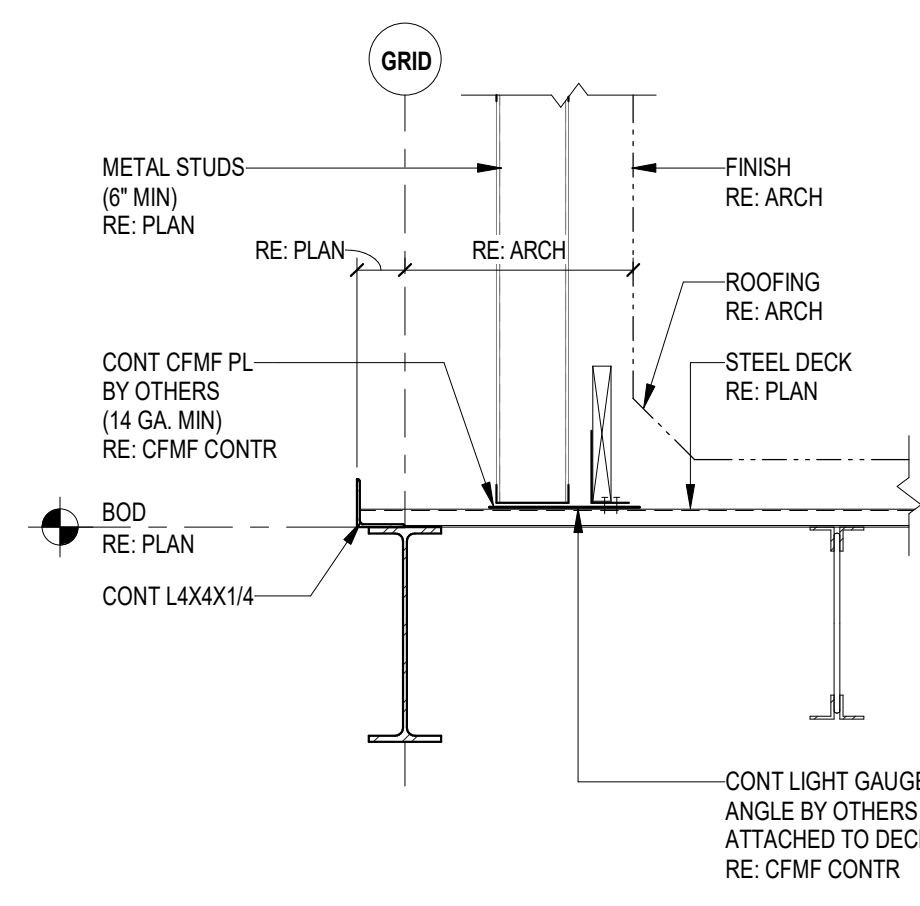
No.	Description	Date

ROOF FRAMING  
DETAILS

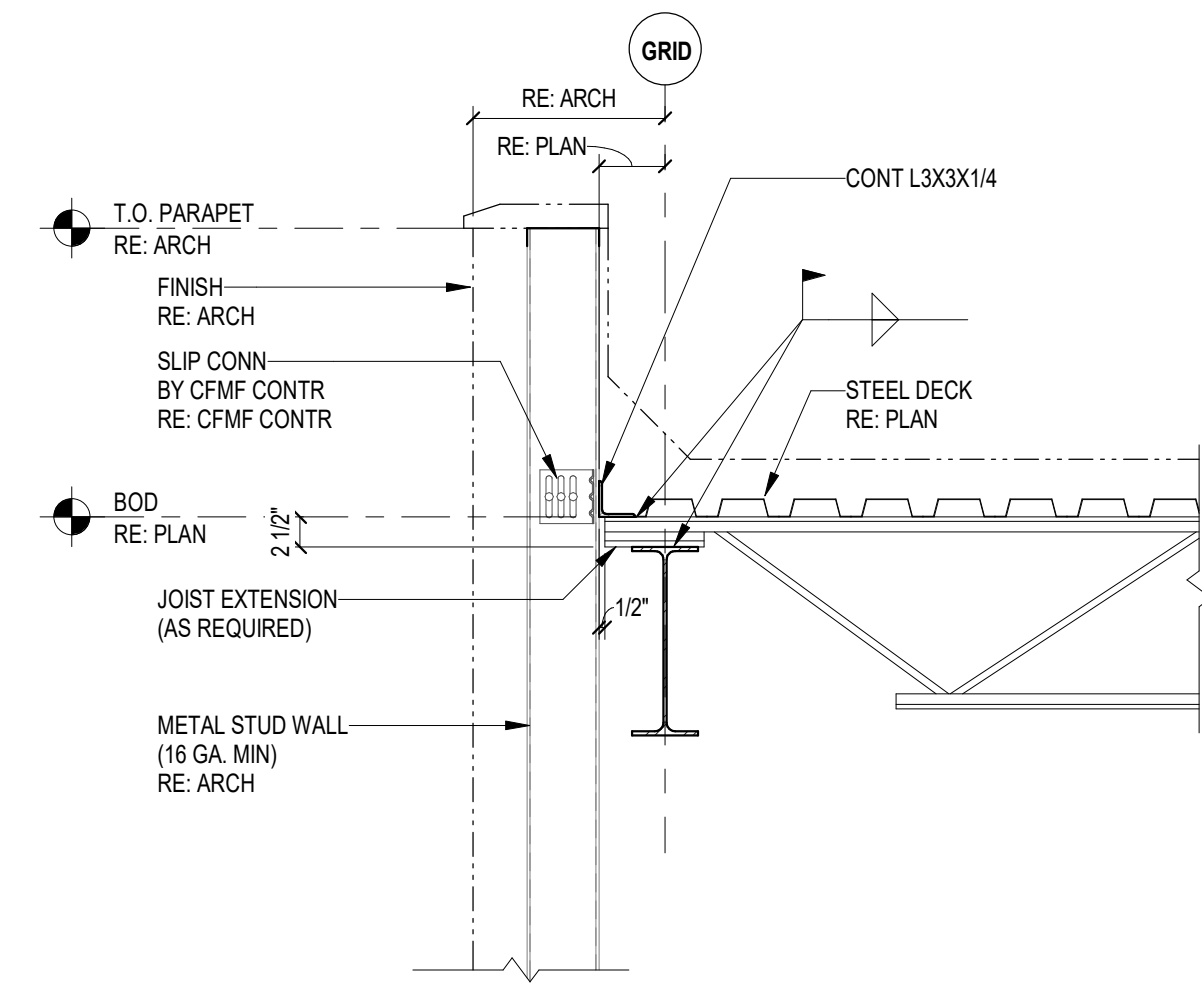
**S506**

**Dally**  
+ ASSOCIATES

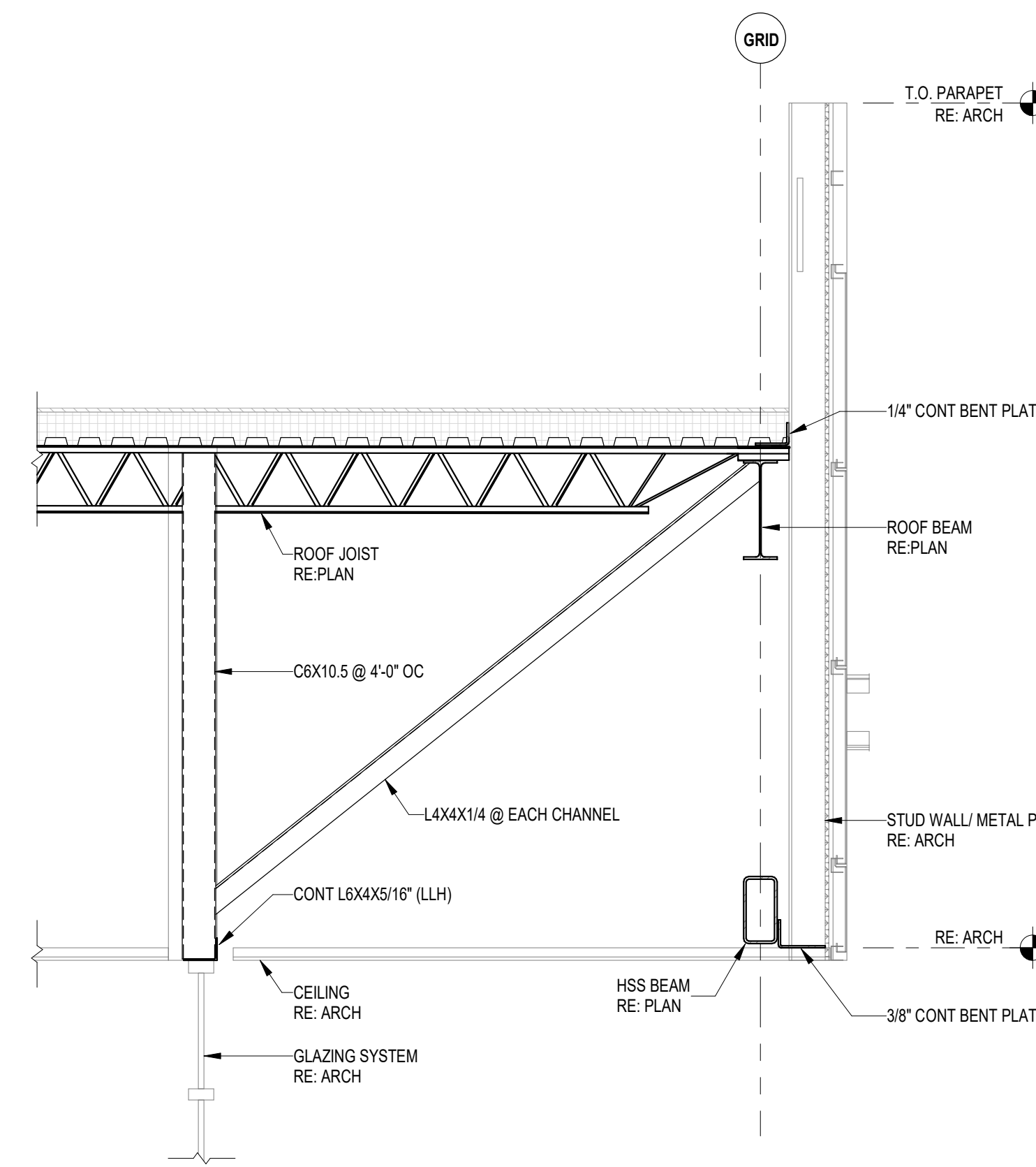
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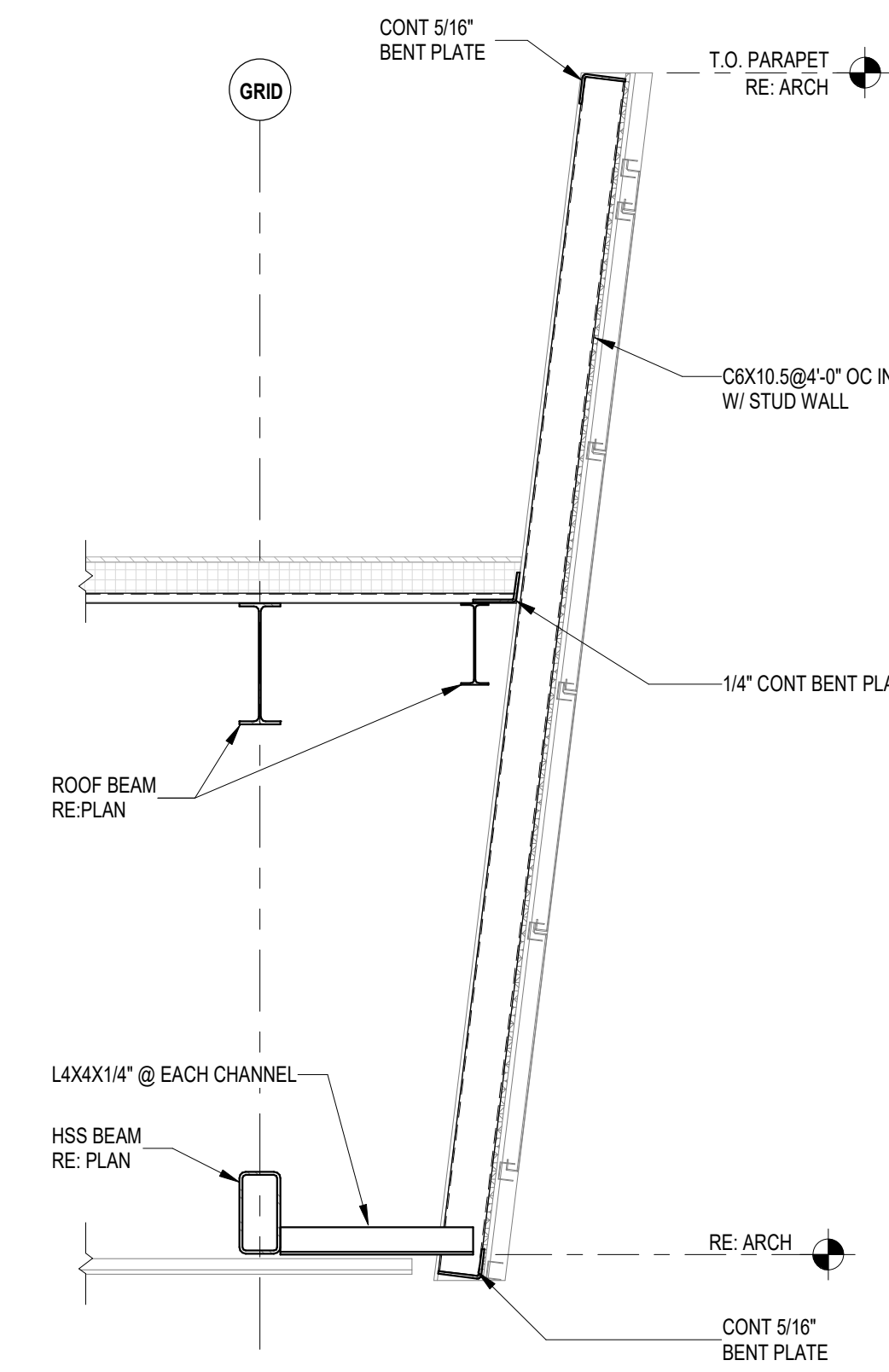
1 ROOF SECTION  
3/4" = 1'-0"



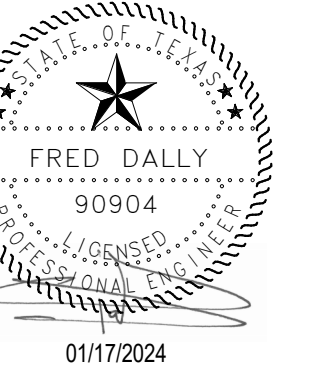
2 SECTION  
3/4" = 1'-0"



3 ROOF SECTION  
1/2" = 1'-0"



4 ROOF SECTION  
1/2" = 1'-0"



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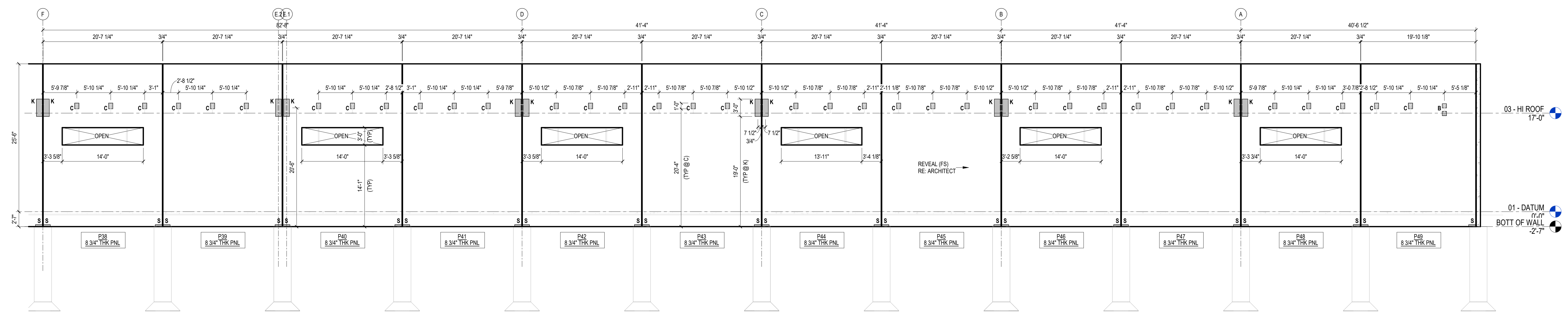
No.	Description	Date

PANEL ELEVATIONS

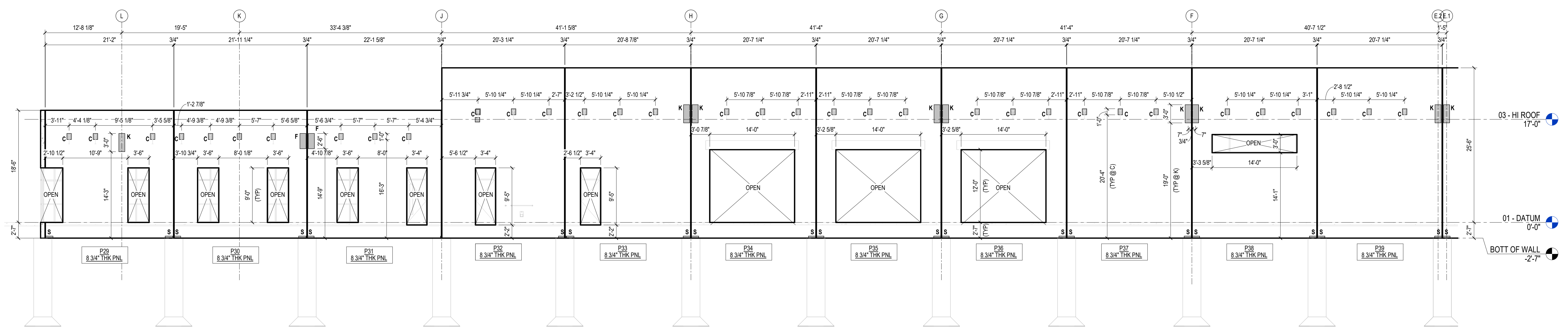


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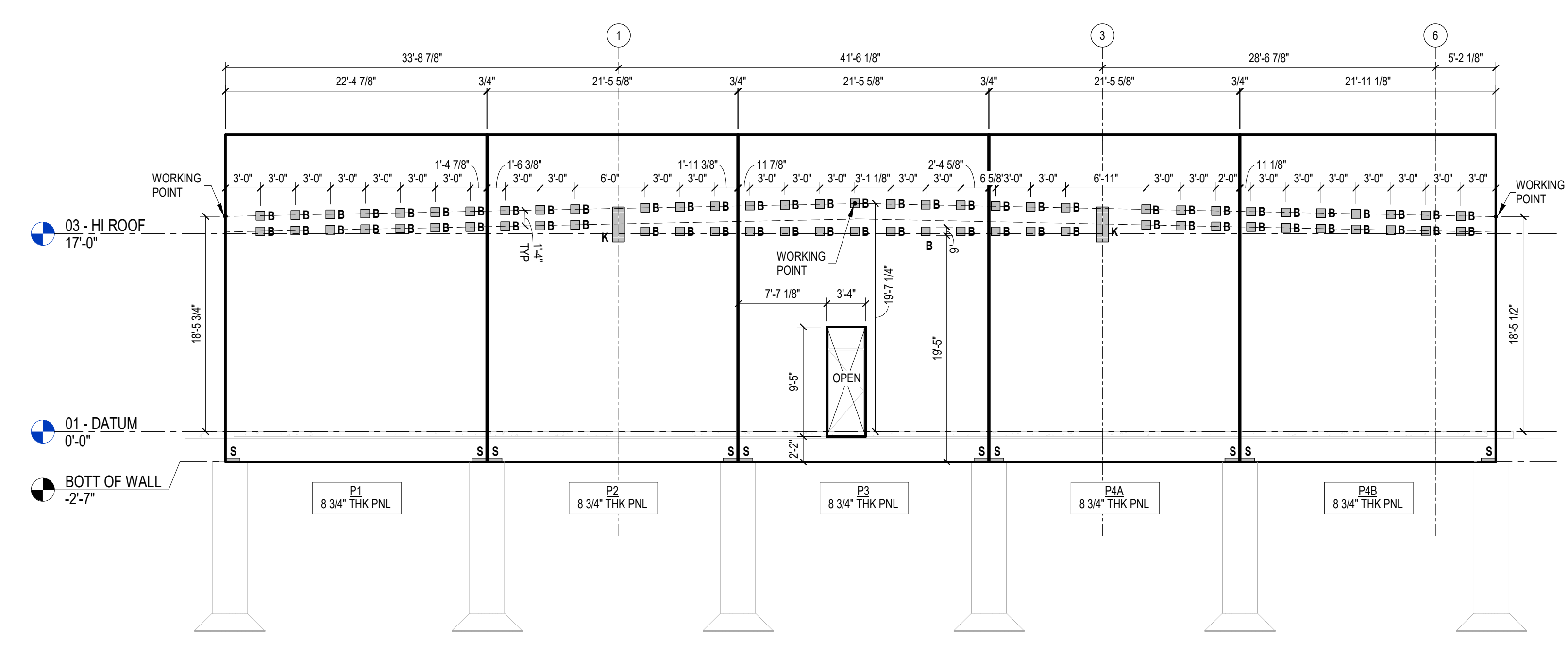
S601



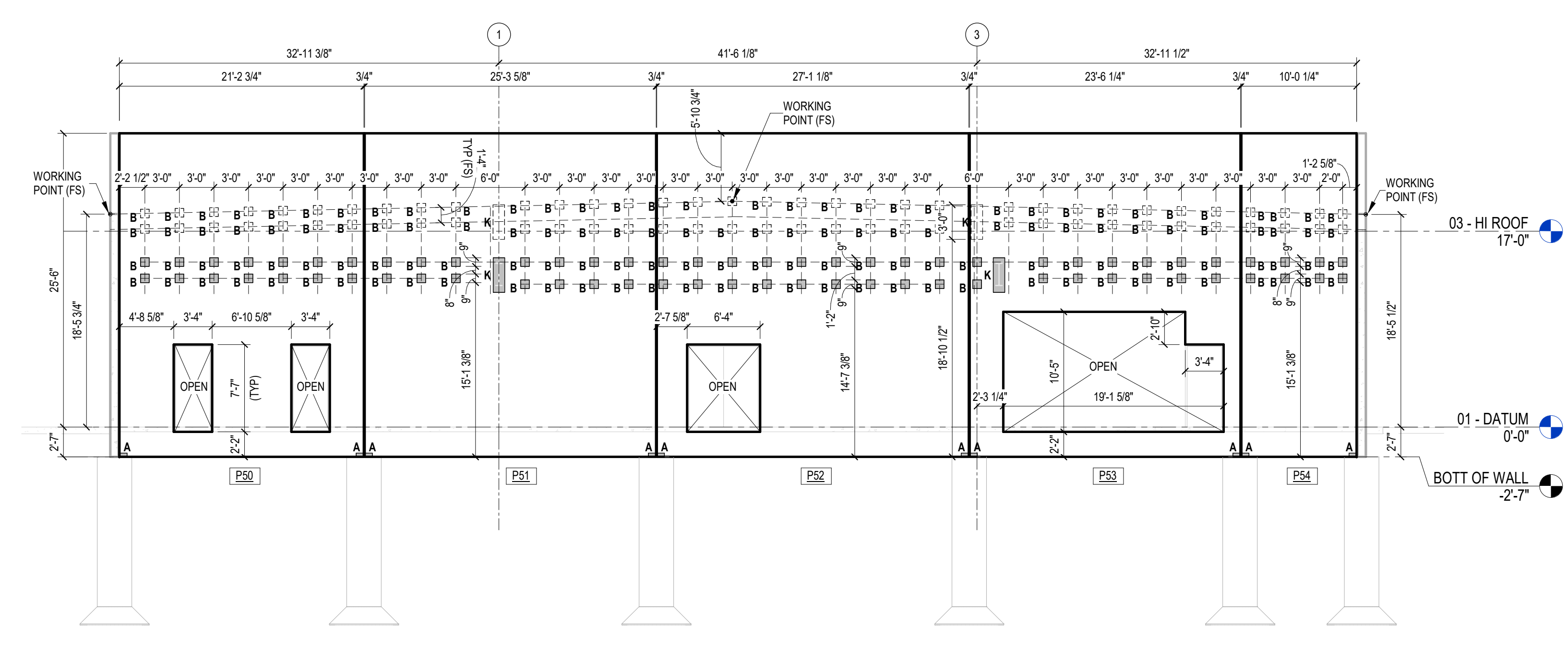
1 WALL ELEVATION  
1/8" = 1'-0"



2 WALL ELEVATION  
1/8" = 1'-0"

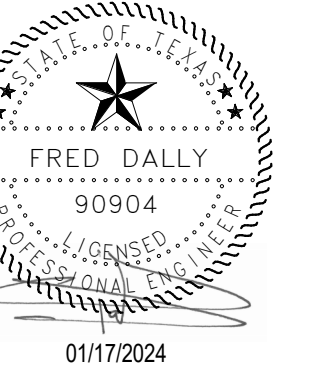


3 WALL ELEVATION  
1/8" = 1'-0"



4 WALL ELEVATION  
1/8" = 1'-0"

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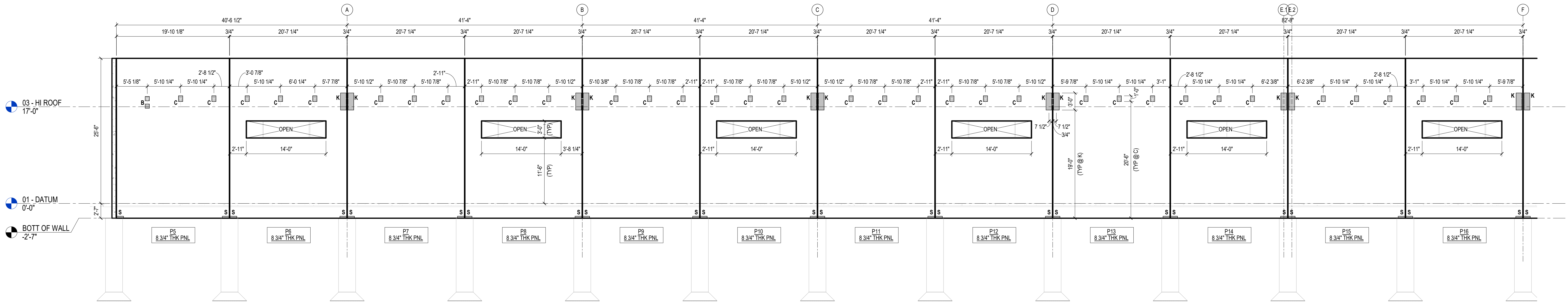
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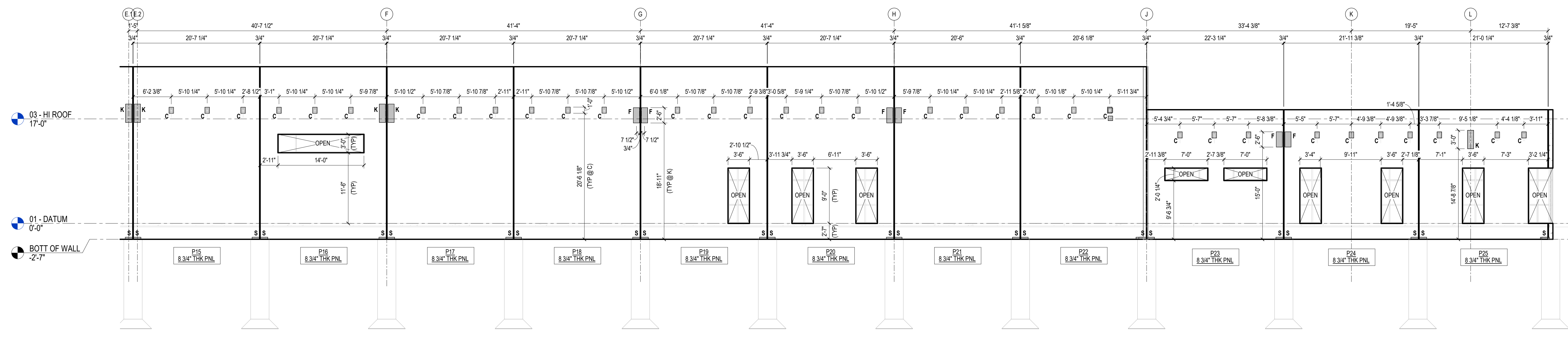
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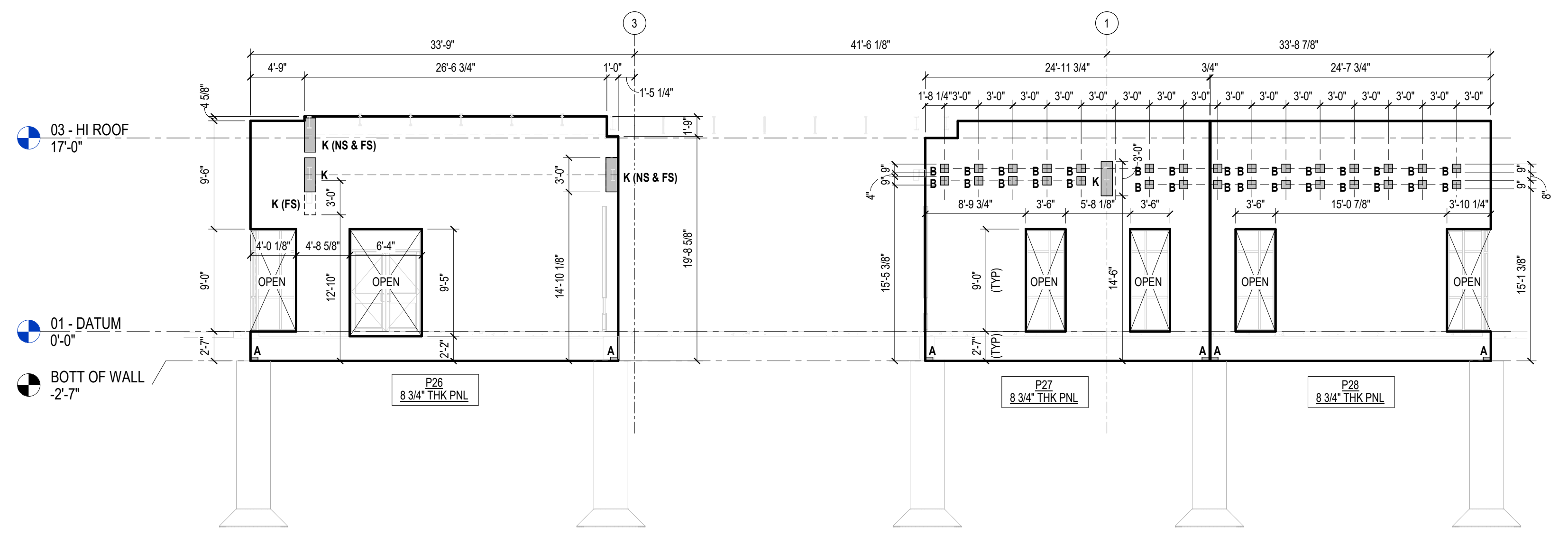
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1 WALL ELEVATION  
1/8" = 1'-0"



2 WALL ELEVATION  
1/8" = 1'-0"



3 WALL ELEVATION  
1/8" = 1'-0"

Project No.: 2330

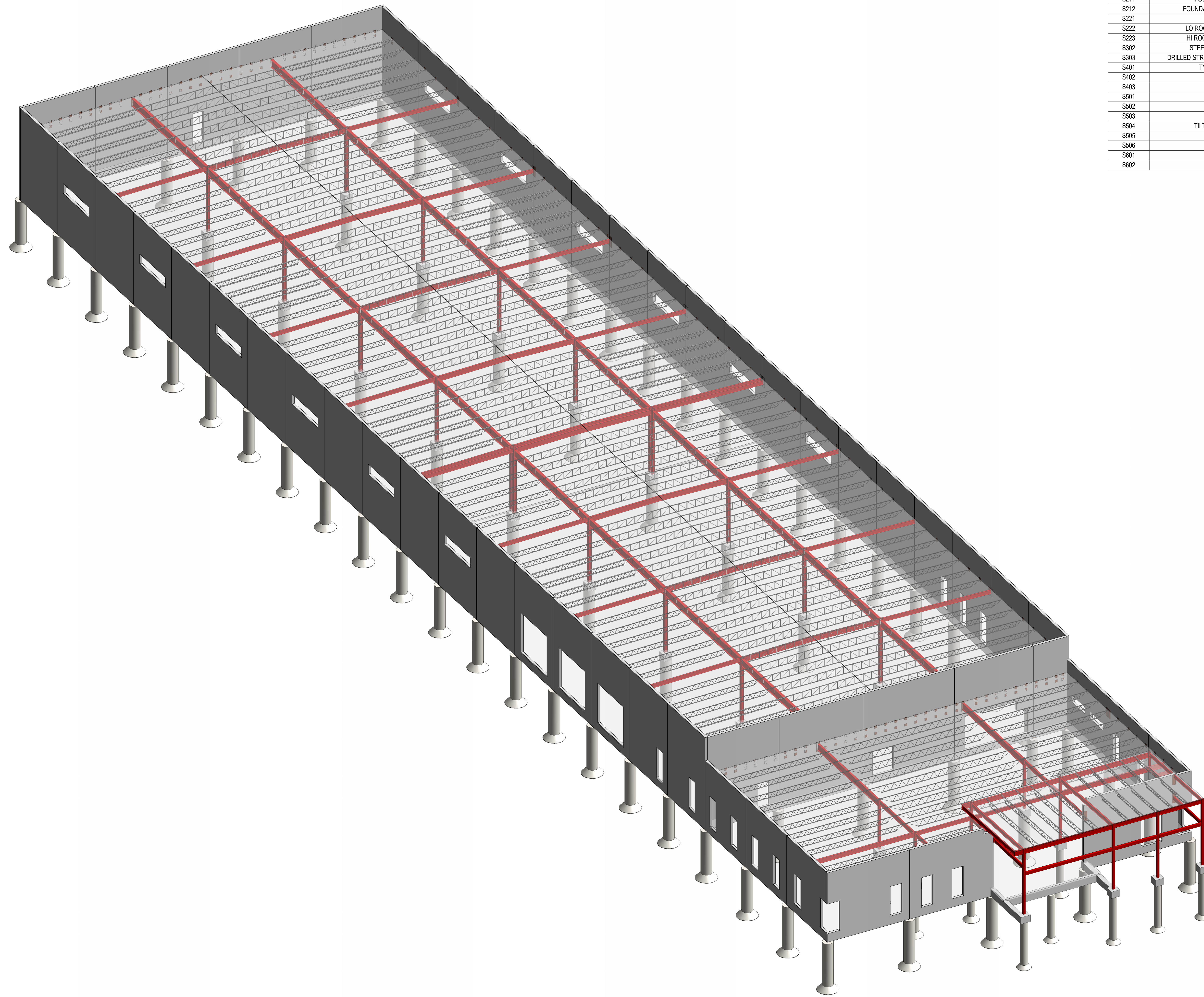
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Scale: AS NOTED

Issue Log:

No.	Description	Date
1	100%CD	01.17.2024

Revisions:

No.	Description	Date



SHEET LIST	
Sheet Number	Sheet Name
S001	3D VIEW AND SHEET LIST
S101	GENERAL STRUCTURAL CRITERIA
S211	FOUNDATION FLOOR PLAN AREA A
S212	FOUNDATION FLOOR PLAN AREA B - ADMIN
S221	FRAMING PLAN AREA A
S222	LO ROOF FRAMING PLAN AREA B - ADMIN
S223	HI ROOF FRAMING PLAN AREA B - ADMIN
S302	STEEL COLUMN SCHEDULE & DETAILS
S303	DRILLED STRAIGHT SHAFT PIER SCHEDULE & DETAILS
S401	TYPICAL FOUNDATION DETAILS
S402	FOUNDATION DETAILS
S403	FOUNDATION SITE DETAILS
S501	TYPICAL FRAMING DETAILS
S502	TYPICAL FRAMING DETAILS
S503	TYPICAL TILT WALL DETAILS
S504	TILT WALL ROOF FRAMING DETAILS
S505	ROOF FRAMING DETAILS
S506	ROOF FRAMING DETAILS
S601	PANEL ELEVATIONS
S602	PANEL ELEVATIONS



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3D VIEW AND SHEET LIST

S001



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 t 713 337 8881  
 Texas Registered Engineering Firm  
 F-003426

1 3D VIEW

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1. STRUCTURAL CONCEPT, STANDARDS AND LOADS

A. DESIGN CONCEPT: THE STRUCTURE AS SHOWN HAS BEEN DESIGNED IN ACCORDANCE WITH THE BUILDING CODE REQUIREMENTS AND DESIGN STANDARDS TO SUPPORT THE FINAL BUILDING SERVICE LOADS...

B. BUILDING CODES AND DESIGN STANDARDS: 1. INTERNATIONAL BUILDING CODE, 2015 EDITION. 2. AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE), MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, ASCE 7-10, AS AMENDED.

3. AMERICAN CONCRETE INSTITUTE (ACI), BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE, ACI 318, AS AMENDED. 4. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, 14TH EDITION (ASD), 2005, AS AMENDED.

5. AMERICAN WELDING SOCIETY (AWS). 6. STEEL JOIST INSTITUTE (SJI), STANDARD SPECIFICATIONS FOR OPEN WEB STEEL JOISTS AND JOIST GIRDERS. 7. STEEL DECK INSTITUTE (SDI), DESIGN MANUAL FOR COMPOSITE DECKS, FORM DECKS, ROOF DECKS, AND CELLULAR METAL FLOOR DECK WITH ELECTRICAL DISTRIBUTION.

8. AMERICAN IRON AND STEEL INSTITUTE (AISI), SPECIFICATION FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS, LATEST EDITION. C. GRAVITY LOADS: SUPERIMPOSED LOADS ARE GIVEN IN POUNDS PER SQUARE FOOT (PSF).

Table with 3 columns: BUILDING AREA, DEAD LOAD (PSF), LIVE LOAD (PSF). Rows include 1. SLAB ON GRADE (0, 100), 2. ROOF (20, 20), 3. MECHANICAL AREAS (10, 150'²).

\* EQUIPMENT ALLOWANCE OF 15 PSF FOR PARTITION WEIGHT EQUIPMENT WEIGHT FLOORER

D. LATERAL DESIGN LOADS:

1. WIND LOADS FOR AN ULTIMATE WIND SPEED OF 135 MPH 3-SECOND GUST, WITH EXPOSURE B AND A RISK CATEGORY I (ASCE 7-10 METHOD).

2. COMPONENT AND CLADDING PRESSURES ARE AS FOLLOWS:

Table with 5 columns: TYPE, TRIBUTARY AREA, CORNER, PERIMETER, FIELD. Rows include WALLS, ROOF, PARAPET for 100 FT² and 100 FT²².

- a. RE: IBC 2015 FOR DESCRIPTION OF CORNER, PERIMETER & FIELD. b. POSITIVE PRESSURES ARE PRESSURES ACTING TOWARD THE BUILDING. c. NEGATIVE PRESSURES ARE PRESSURES ACTING AWAY FROM THE BUILDING.

E. SEISMIC CRITERIA:

- 1. IMPORTANCE FACTOR: 1.00. 2. RISK CATEGORY: I. 3. MAPPED SPECTRAL RESPONSE ACCELERATIONS: a. Ss: 0.069, b. S1: 0.036. 4. SITE CLASS: D. 5. SPECTRAL RESPONSE COEFFICIENTS: a. SDS: 0.074, b. SD1: 0.058. 6. SEISMIC DESIGN CATEGORY: A. 7. BASIC SEISMIC FORCE-RESISTING SYSTEM: "TBD" (EX: STRUCTURAL STEEL SYSTEMS NOT SPECIFICALLY DESIGNED FOR SEISMIC RESISTANCE).

F. SPECIAL LOADS:

Table with 3 columns: SIZE, WEIGHT MAX, SPACING OF HANGERS. Rows include 4" DIA, 6" DIA, 8" DIA, 10" DIA, 12" DIA.

VALUES ASSUME SCHEDULE 40 STEEL PIPE

2. GENERAL NOTES FOR CONSTRUCTION

A. CONSTRUCTION METHODS, PROCEDURES AND SEQUENCES ARE THE RESPONSIBILITY OF THE CONTRACTOR AND THE CONTRACTOR SHALL TAKE ALL THE NECESSARY MEANS TO MAINTAIN AND PROTECT THE STRUCTURAL INTEGRITY OF ALL CONSTRUCTION AT ALL STAGES.

B. THESE NOTES APPLY TO STRUCTURAL DOCUMENTS SEALED BY THE STRUCTURAL ENGINEER AND ARE INTENDED TO BE COMPLEMENTARY TO AND USED IN CONJUNCTION WITH THE PLANS AND SPECIFICATIONS, INCLUDING THOSE PREPARED BY OTHER DISCIPLINES. CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE ARCHITECT/STRUCTURAL ENGINEER IMMEDIATELY. ANY SUCH DISCREPANCIES SHALL BE RESOLVED TO THE MORE STRINGENT REQUIREMENTS, UNLESS OTHERWISE AUTHORIZED BY THE STRUCTURAL ENGINEER.

C. ANY DISCREPANCIES ON THE STRUCTURAL DOCUMENTS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT/STRUCTURAL ENGINEER PRIOR TO SUBMISSION OF BIDS OR PROPOSALS, OR IF NOT REASONABLY DISCOVERABLE DURING PREPARATION OF BIDS AND PROPOSALS, BEFORE COMMENCING THE WORK IN QUESTIONS. NO FIELD CHANGES OR DIVISIONS FROM THE DESIGN ARE TO BE MADE WITHOUT PRIOR WRITTEN APPROVAL OF THE ARCHITECT AND/OR STRUCTURAL ENGINEER. NO CHANGE ORDER CONSIDERATION WILL BE GIVEN TO CHANGES FOR WHICH THE ARCHITECT AND/OR ENGINEER WERE NOT CONTACTED PRIOR TO CONSTRUCTION OF THE AFFECTED ITEM.

D. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONSTRUCTION, INCLUDING EXISTING WORK, PRIOR TO COMMENCING WORK. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ARCHITECT/STRUCTURAL ENGINEER.

E. ALL PROPOSED SUBSTITUTIONS MUST BE EQUAL OR BETTER AND SHALL BE REVIEWED BY THE ARCHITECT/ENGINEER PRIOR TO ANY PERMIT WORK AND PRIOR TO THE AWARD OF THE CONTRACT.

F. NOT ALL OPENINGS AND OTHER COMPONENTS THAT ARE REQUIRED HAVE BEEN SHOWN IN THE STRUCTURAL DRAWINGS. COORDINATE WITH THE ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS AND VERIFY THE LOCATIONS AND SIZES OF ALL CHASES, INSERTS, OPENINGS, SLEEVES, FINISHES, DEPRESSIONS, PADS AND OTHER PROJECT REQUIREMENTS. FLOOR PLAN WILL BE FURNISHED FOR THAT PURPOSE.

G. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE MECHANICAL, ELECTRICAL, PLUMBING AND ARCHITECTURAL DRAWINGS TO DETERMINE WHERE OPENINGS ARE REQUIRED IN REINFORCED CONCRETE BEAMS, SLABS AND WALLS.

H. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, DETAILING ALL THE OPENINGS, INCLUDING ADDITIONAL REINFORCEMENT AS SHOWN ON THE TYPICAL WALL, SLAB AND BEAM OPENING DETAILS FOR REVIEW.

I. ADDITIONAL REINFORCEMENT ABOVE THAT SHOWN IN THE TYPICAL SLAB AND BEAM OPENING DETAILS MAY BE REQUIRED AND WILL BE REVIEWED ON THE SHOP DRAWINGS. J. USE THE MANUFACTURER'S CERTIFIED DRAWINGS AND SPECIFICATIONS FOR THE EQUIPMENT ANCHORAGE AND DETAILS.

K. ALL CONSTRUCTION JOINTS SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE INCORPORATED INTO THE STRUCTURE. ADDITIONAL CONSTRUCTION JOINTS TO FACILITATE CONSTRUCTION SHALL BE LOCATED AND DETAILED ON THE SHOP DRAWINGS FOR REVIEW.

L. HORIZONTAL CONSTRUCTION JOINTS SHALL NOT BE PERMITTED IN BEAMS UNLESS SHOWN ON THE STRUCTURAL DRAWINGS.

M. ALL CONSTRUCTION AND CONTROL JOINTS FOR BEAMS WHICH ARE EXPOSED TO VIEW ARE TO BE LOCATED TO COINCIDE WITH THE ARCHITECTURAL RUSTICATION JOINTS AS SHOWN ON THE BUILDING ELEVATION SHEETS OR AS REVIEWED IN WRITING.

N. SHOP DRAWINGS:

1. THE TERM "SHOP DRAWINGS" INCLUDES FABRICATION, MANUFACTURING, ERECTION AND SETTING DRAWINGS, BROCHURES, CERTIFICATES, AND PRODUCT DATA DESCRIBING MATERIALS AND EQUIPMENT. SHOP DRAWINGS SHALL INCLUDE ALL PERTINENT INFORMATION REQUIRED FOR THE ENGINEER TO FULLY EVALUATE THE MATERIALS BEING REPRESENTED BY THE SUBMITTAL INCLUDING THE PHYSICAL PROPERTIES, DIMENSIONS, LOCATIONS AND METHOD OF INSTALLATION.

2. SHOP DRAWINGS WILL BEAR THE REVIEW STAMP OF THE CONTRACTOR INDICATING THAT HE HAS REVIEWED THE DRAWINGS FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS. COORDINATED ITEMS INCLUDED IN THE SUBMITTAL WITH RELATED ITEMS, AND VERIFIED AND COORDINATED DIMENSIONS.

3. REPRODUCTIONS OF THE ENGINEERING DRAWINGS WILL NOT BE ACCEPTABLE AS SHOP DRAWINGS.

4. ANY SHOP DRAWING NOT CONFORMING TO THESE REQUIREMENTS WILL BE CAUSE FOR REJECTION AND WILL BE RETURNED WITHOUT ANY FURTHER ACTION.

5. STRUCTURAL SUBMITTALS REQUIRED FOR APPROVAL INCLUDE, BUT ARE NOT LIMITED TO:

- CONCRETE ACCESSORIES (MANUFACTURERS PRODUCT DATA) STEEL REINFORCING CONCRETE MIX DESIGN CONTROL JOINT LAYOUT CONCRETE MATERIAL CERTIFICATES STRUCTURAL STEEL FRAMING STRUCTURAL STEEL CONNECTION CALCULATIONS STEEL ROOF DECK COLD FORMED METAL FRAMING CALCULATIONS MISC. STEEL FABRICATIONS

3. CONCRETE

A. CONCRETE SCHEDULE:

Table with columns: BUILDING COMPONENT, 28 DAY CYLINDER COMPRESSIVE STRENGTH (POUNDS PER SQUARE INCH-PSI), NORMAL WEIGHT, MAX AGGREGATE SIZE (IN), SLUMP (IN), W/C RATIO. Rows include 1. DRILLED PIERS, 2. SLAB-ON-GRADE, 3. PLINTHS AND GRADE BEAMS, 4. TILT UP PANELS, 5. ALL OTHER CONCRETE.

B. PROVIDE DEFORMED NUB BULLET STEEL BARS CONFORMING TO ASTM #615, GRADE 60. ALL REINFORCING STEEL SHALL BE SECURELY HELD IN PLACE. PROVIDE ADDITIONAL BARS OR STIRRUPS FOR SUPPORT AS REQUIRED.

C. WELDED WIRE FABRIC SHALL CONSIST OF FLAT SHEETS AND SHALL CONFORM TO ASTM A188, WITH A MINIMUM YIELD STRENGTH OF 65.0 KSI.

D. PROVIDE FULL EMBEDMENT WITH STANDARD 90 DEGREE HOOKS FOR ALL DOWELS. IF NOT OTHERWISE SPECIFIED, THE DOWEL SIZE AND SPACING SHALL BE THE SAME AS THE MAIN REINFORCING.

E. WHEN REINFORCING STEEL, IN GRADE BEAMS, WALLS, SLABS AND BEAMS, IS NOTED AS CONTINUOUS, SPLICE REINFORCING STEEL ONLY WHEN UNAVOIDABLE DUE TO STOCK LENGTHS. STAGGER ALL SPLICES A MINIMUM OF 4'-0". ADJACENT BAR SPLICES ARE NOT ACCEPTABLE.

F. PROVIDE INTERIOR AND EXTERIOR HORIZONTAL LAPPED CORNER BARS AT ALL CORNERS TO MATCH THE SIZE, TYPE AND SPACING OF THE WALL AND GRADE BEAM REINFORCING.

G. UNLESS SPECIFICALLY NOTED, SCHEDULED OR DETAILED OTHERWISE, PROVIDE DEVELOPMENT LENGTH FOR REINFORCING IN CONCRETE COMPONENTS IN ACCORDANCE WITH THE SCHEDULE IN NOTE H. BELOW. THIS SCHEDULE SHALL APPLY TO ALL DEVELOPMENT LENGTHS NOT OTHERWISE NOTED.

H. REINFORCING BAR DEVELOPMENT LENGTHS (Ld) IN INCHES FOR VARIOUS CONCRETE STRENGTHS IN POUNDS PER SQUARE INCH (PSI). TOP BARS ARE DEFINED AS HORIZONTAL REINFORCING SO PLACED IN A MEMBER THAT MORE THAN 12 INCHES OF CONCRETE IS CAST BELOW THE BAR. ALL OTHER CONDITIONS ARE CONSIDERED BOTTOM BARS FOR DEVELOPMENT AND SPLICE LENGTH PURPOSES.

Table with columns: BAR SIZE GRADE 60, Ld FOR TOP BARS, Ld FOR BOTTOM BARS. Rows include #3 through #11.

1. WHEN TWO BARS OF DIFFERENT SIZES ARE LAPPED, THE SMALLER SIZE SHALL GOVERN THE LAP LENGTH UNLESS SPECIFICALLY NOTED.

2. WELDED OR MECHANICAL SPLICES CAPABLE OF DEVELOPING 125% OF THE BAR YIELD STRENGTH MAY BE USED IN LIEU OF THE LAPS. SUCH SPLICES MAY BE EITHER FULL BUTT WELDS OR SERIES "C" COLDWELDS OR EQUAL.

3. AT LAP SPLICES, PROVIDE LAP SPLICE LENGTHS FOR REINFORCING BARS 1.3 TIMES THE Ld SHOWN IN TABLE H ABOVE.

4. THE GENERAL NOTES, LAP LENGTHS OR DETAILS PERTAINING TO REINFORCING STEEL AS SHOWN ON THE DETAIL SHEETS OR OTHER SCHEDULES SHALL SUPERSEDE THE NOTES SHOWN ON THIS SHEET.

I. PROVIDE THE FOLLOWING COVER FOR CAST-IN-PLACE CONCRETE REINFORCING:

- 1. UNIFORM SURFACES IN CONTACT WITH EARTH: 3 INCHES. 2. UNIFORM SURFACES OVER MOISTURE BARRIER: 2 INCHES. 3. FORMED SURFACES EXPOSED TO EARTH OR WEATHER: a. #6 AND LARGER: 2 INCHES. b. #5 AND SMALLER: 1 1/2" INCHES. 4. FORMED SURFACES NOT EXPOSED TO EARTH OR WEATHER: a. SLABS AND WALLS: 3/4 INCHES. b. BEAMS AND COLUMNS: 1 1/2 INCHES.

4. EXCAVATION, BACKFILLING & FOUNDATIONS

A. A GEOTECHNICAL EXPLORATION OF SUBSURFACE CONDITIONS, CONTAINING TEST BORINGS, LABORATORY TEST, ENGINEERING ANALYSIS AND FOUNDATION RECOMMENDATIONS, PERFORMED BY GEOSCIENCE ENGINEERING AND TESTING, INC., DATED NOVEMBER 21, 2023, REPORT NO. 230512413, IS AVAILABLE FOR REVIEW.

B. MAINTAIN PROPER SITE DRAINAGE DURING CONSTRUCTION SO THAT PONDING OF WATER DOES NOT OCCUR IN THE BUILDING AREA.

C. SUB-GRADE PREPARATION:

- 1. PERFORM DEMOLITION OF EXISTING STRUCTURES AS REQUIRED BY THE GEOTECHNICAL REPORT. THE ENTIRE VOLUME OF THE EXCAVATIONS CREATED BY DEMOLITION AND REMOVAL OF EXISTING STRUCTURES SHOULD BE BACKFILLED WITH ENGINEER (SELECT) FILL THAT IS PROPERLY PLACED AND COMPACTED. 2. EXCAVATE EXISTING SOILS AS REQUIRED TO REMOVE ALL EXISTING VEGETATION, ROOTS AND DELETERIOUS MATERIALS FROM THE PROPOSED BUILDING AREA, AND AS REQUIRED BY GEOTECHNICAL REPORT. THE CLEARING SHOULD EXTEND BEYOND THE BUILDING EDGES ONCE ROUGH GRADE IS ESTABLISHED. THE EXPOSED SURFACE SHOULD BE PROOF-ROLLED. ANY SOFT POCKETS OF SOFT OR WEAK SOILS ENCOUNTERED SHOULD BE REMOVED. BUILD BUILDING PAD AS REQUIRED BY GEOTECHNICAL REPORT. 3. BUILDING PAD UNDER SLAB ON GRADE SHALL BE PREPARED TO PROVIDE AN OWNER APPROVED PVR OF 1" OR LESS BASED ON RECOMMENDATIONS IN THE PROJECT GEOTECHNICAL REPORT.

D. FOUNDATIONS HAVE BEEN DESIGNED FOR A NET ALLOWABLE BEARING PRESSURE OF 4,000 PSF AT A MINIMUM EMBEDMENT DEPTH OF 15'-0" BELOW EXISTING GRADE ELEVATION.

E. REFER TO THE GEOTECHNICAL EXPLORATION FOR ADDITIONAL INFORMATION.

F. INSTALL SLAB ON GRADE OVER 15 MIL VAPOR BARRIER.

5. STRUCTURAL STEEL

A. ROLLED SHAPES:

- 1. ALL STRUCTURAL STEEL FOR ALL THE HORIZONTAL FRAMING MEMBER SHALL CONFORM TO ASTM A992, GRADE 50, UNLESS OTHERWISE NOTED. 2. ALL STRUCTURAL STEEL FOR HOLLOW STRUCTURAL SECTIONS SHALL CONFORM TO ASTM A500, GRADE B WITH A MINIMUM YIELD OF 46 KSI, UNLESS OTHERWISE NOTED. 3. ALL STRUCTURAL STEEL FOR PIPE SHALL CONFORM TO ASTM A53, TYPE E OR S, GRADE B, UNLESS OTHERWISE NOTED. 4. ALL STRUCTURAL STEEL FOR ANGLES, PLATES AND MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36, UNLESS OTHERWISE NOTED. 5. ALL EXPOSED STEEL TO BE GALVANIZED.

B. CONNECTIONS:

- 1. THE DESIGN OF STRUCTURAL STEEL CONNECTIONS IS THE RESPONSIBILITY OF THE CONTRACTOR AND THE STEEL FABRICATOR. THE DESIGN OF THE CONNECTION SHALL BE PERFORMED BY A REGISTERED PROFESSIONAL ENGINEER EMPLOYED BY THE STEEL FABRICATOR. THE DETAILS AND CALCULATIONS SHALL INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING: A. ALL WELD SIZES AND LENGTHS. B. ALL BOLT SIZES, LOCATIONS, QUANTITIES AND GRADES. C. ALL PLATE AND ANGLE SIZES, THICKNESS AND DIMENSIONS. D. ALL WORK POINT LOCATIONS AND RELATED INFORMATION. 2. PROVIDE STANDARD BOLTED CONNECTIONS CONFORMING TO AISC BOLTED CONNECTIONS, USING ASTM A325 OR A490 BOLTS, FOR THE BEAM END SHEARS INDICATED IN THE DOCUMENTS. PROVIDE MINIMUM OF TWO BOLTS FOR ALL CONNECTIONS. 3. ALL WELDED CONNECTIONS SHALL CONFORM TO AISC UNLESS OTHERWISE NOTED. 4. SURVEY ALL PLANS, DETAILS, SECTIONS, SCHEDULES AND SPECIFICATIONS FOR SPECIAL CONNECTIONS. 5. UNLESS OTHERWISE NOTED AND/OR SPECIFIED, ALL BEAM CONNECTIONS SHALL BE DESIGNED TO SUPPORT 1/2 THE TOTAL UNIFORM LOAD FOR THE APPLICABLE MEMBER SIZE AND SPAN AS DETERMINED BY THE TABLES FOR ALLOWABLE UNIFORM LOADS ON BEAM IN THE 16TH EDITION OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL OF STEEL CONSTRUCTION (ASD). 6. WHERE BEAMS ARE TO RECEIVE HEADED SHEAR CONNECTORS, DESIGN THOSE BEAM CONNECTIONS FOR THE REACTION SHOWN. IF REACTIONS ARE NOT SHOWN, DESIGN THE CONNECTIONS TO SUPPORT 40 PERCENT OF THE MAXIMUM WEB SHEAR, V, FOR THE APPLICABLE MEMBER SIZE AS DETERMINED BY THE TABLES FOR ALLOWABLE UNIFORM LOADS ON BEAMS IN THE 16TH EDITION OF THE AISC MANUAL. 7. MOMENT CONNECTIONS SHOWN SHALL BE DESIGNED TO FULLY DEVELOP THE SECTION IN FLEXURE AND TO SUPPORT 1/2 THE TOTAL UNIFORM LOAD FOR SHEAR AS DESCRIBED IN NOTE 5 ABOVE. 8. WHERE FILLET WELD IS NOT SHOWN ON DETAIL, ITS SIZE SHALL BE ASSUMED TO BE THE PLATE THICKNESS OF THE THINNEST PIECE MINUS 1/16".

C. WELDS:

- 1. CONFORM TO "CODE FOR WELDING IN BUILDING CONSTRUCTION" BY THE AMERICAN WELDING SOCIETY, LATEST EDITION. 2. WELDS ON INDICATED ON DRAWINGS ARE TO BE FILLET ALL AROUND AS PRESCRIBED BY AISC SPECIFICATION. PROVIDE WELDING OF CONTINUOUS MEMBERS OF 2 INCHES OF 3/16" INCH FILLET STITCH WELDS AT 12 INCHES OC, STAGGERED EACH SIDE, UNLESS OTHERWISE NOTED. 3. FIELD PAINT ALL WELDS W/ "GALVALUME" BY Z.R.C. OR APPROVED EQUAL ARC WELDING ELECTRODES. 4. METAL DECK - EX0X STRUCTURAL STUDS - E8022 OR E9011, 3/32" RODS. ALL OTHER - E70XX LOW HYDROGEN, 250 DEGREE MIN. OVEN TEMP. 5. SIZE - ALL FILLETS ARE 1/16" LESS THAN MINIMUM THICKNESS TO BE WELDED 6. PROVIDE ULTRASONIC INSPECTION BY THE TESTING LABORATORY FOR ALL WELDS INDICATED AS PENETRATION WELDS.

D. HEADED SHEAR CONNECTORS:

1. ALL HEADED SHEAR CONNECTORS SHALL BE 3/4 IN. DIAMETER STUDS x 4 1/2 IN. LONG AFTER WELDING AND SHALL CONFORM TO ASTM A108 UNLESS OTHERWISE NOTED.

E. OPEN WEB STEEL JOISTS:

- 1. AS APPLICABLE FOR THE OPEN WEB STEEL JOIST TYPE INDICATED ON THE DRAWINGS, CONFORMING TO SJI OR AISC, WHICHEVER IS MORE STRINGENT. 2. PROVIDE JOIST BRIDGING IN ACCORDANCE WITH SJI. 3. DESIGN ROOF JOISTS USING GOVERNING LOAD COMBINATIONS WITH UPLIFT PRESSURES INDICATED ON COMPONENT AND CLADDING PRESSURES TABLE.

F. STEEL DECK:

- 1. PROVIDE STEEL ROOF DECK 1 1/2" DEEP TYPE B @ 24 GAUGE STEEL SHEETS AND CONFORMING TO ASTM A653, STRUCTURAL STEEL (SS), GRADE 33, GALVANIZED COATING DESIGNATION G60. 2. PROVIDE STEEL ROOF DECK WITH THE FOLLOWING MINIMUM SECTION PROPERTIES: a. MOMENT OF INERTIA: I = 201 INCHES⁴ /FOOT WIDTH b. SECTION MODULUS: Sx = 234 INCHES³ /FOOT WIDTH c. SECTION MODULUS: Syy = 247 INCHES³ /FOOT WIDTH 3. ATTACH STEEL ROOF DECK TO STEEL SUPPORTS AND AT SIDE LAPS AS FOLLOWS: a. POWDER-ACTUATED FASTENERS: SUPPORTS: "HLT" X-HSN24 AND "HLT" X-ENP-19L15, 367 PATTERN SIDELAP, #10 "TEK" @ 12" O.C. MAXIMUM b. SCREWS: SUPPORTS: #12 "TEK" SCREWS, 367 PATTERN SIDELAP, #10 "TEK" @ 12" O.C. MAXIMUM

6. INDEPENDENT TESTING LABORATORY & SPECIAL INSPECTIONS

A. A GEOTECHNICAL EXPLORATION OF SUBSURFACE CONDITIONS, CONTAINING TEST BORINGS, LABORATORY TEST, ENGINEERING ANALYSIS AND FOUNDATION RECOMMENDATIONS, PERFORMED BY GEOSCIENCE ENGINEERING AND TESTING, INC., DATED NOVEMBER 21, 2023, REPORT NO. 230512413, IS AVAILABLE FOR REVIEW.

B. EMPLOYMENT OF A TESTING LABORATORY IN NO WAY RELIEVES THE CONTRACTOR OF ANY OBLIGATION TO PERFORM WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

C. CONTRACTOR RESPONSIBILITIES:

- 1. DELIVER TO LABORATORY AT DESIGNATED LOCATION ADEQUATE SAMPLES OF MATERIALS PROPOSED TO BE USED WHICH REQUIRE TESTING, TOGETHER WITH PROPOSED MIX DESIGNS. 2. COOPERATE WITH LABORATORY PERSONNEL AND PROVIDE ACCESS TO WORK AND TO MANUFACTURER'S FACILITIES. 3. PROVIDE INCIDENTAL LABOR AND FACILITIES TO PROVIDE ACCESS IN WORK TO BE TESTED, TO OBTAIN AND HANDLE SAMPLES AT THE SITE OR AT SOURCE OF PRODUCTS TO BE TESTED, TO FACILITATE TEST AND INSPECTIONS AND FOR STORAGE AND CURING OF TEST SAMPLES. 4. NOTIFY LABORATORY OF MATERIAL SOURCES AND FURNISH NECESSARY QUANTITIES OF REPRESENTATIVE SAMPLES OF MATERIALS PROPOSED FOR USE WHICH ARE REQUIRED TO BE TESTED. 5. PROVIDE INCIDENTAL LABOR AND FACILITIES TO PROVIDE ACCESS IN WORK TO BE TESTED, TO OBTAIN AND HANDLE SAMPLES AT THE SITE OR AT SOURCE OF PRODUCTS TO BE TESTED, TO FACILITATE TEST AND INSPECTIONS AND FOR STORAGE AND CURING OF TEST SAMPLES. 6. ADVISE LABORATORY IN A TIMELY FASHION TO COMPLETE REQUIRED INSPECTION AND TESTING PRIOR TO SUBSEQUENT WORK BEING PERFORMED. 7. PAY FOR ALL SUBSEQUENT RE-TESTING OF PRODUCTS OR SYSTEMS FOUND TO BE DEFECTIVE OR OTHERWISE NOT IN ACCORDANCE WITH SPECIFICATION REQUIREMENTS. REMOVE REJECTED PRODUCTS AND REPLACE WITH PRODUCTS OF SPECIFIED QUALITY.

D. SPECIAL INSTRUCTIONS:

- 1. THE OWNER SHALL EMPLOY ONE OR MORE SPECIAL INSPECTOR(S) TO PROVIDE INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF CONSTRUCTION LISTED IN THIS SECTION. THE SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO SHALL DEMONSTRATE COMPETENCE TO THE INSPECTIONS BEING PERFORMED TO THE SATISFACTION OF THE ENGINEER OF RECORD AND THE BUILDING OFFICIAL. THE SPECIAL INSPECTOR SHALL HAVE EXPERIENCE WITH AT LEAST FIVE OTHER PROJECTS SIMILAR IN NATURE. 2. THE PURPOSE OF THE INSPECTIONS SHALL BE TO ENFORCE COMPLIANCE WITH THE CONSTRUCTION DRAWINGS, SPECIFICATIONS, GEOTECHNICAL REPORT AND THE 2015 INTERNATIONAL BUILDING CODE, SECTION 1704. 3. THE FOLLOWING ITEMS REQUIRE INSPECTION BY THE SPECIAL INSPECTOR:

Table with 2 columns: REFERENCED STANDARD, FREQUENCY. Rows include HIGH STRENGTH BOLTING, BEARING TYPE CONNECTIONS, WELDING OF STRUCTURAL STEEL, WELDABILITY OF STEEL, INSPECTION OF STEEL FRAME AND JOISTS.

CONCRETE CONSTRUCTION

Table with 2 columns: REINFORCING STEEL, CONCRETE MIX DESIGN. Rows include REINFORCING STEEL, CONCRETE MIX DESIGN, SAMPLING OF FRESH CONCRETE, MAINTENANCE OF SPECIFIED CURING TEMPS AND TECHNIQUES.

SOILS (SLAB-ON-GRADE):

Table with 2 columns: VISUAL OBSERVATIONS, PROOF ROLLING OBSERVATION. Rows include VISUAL OBSERVATIONS, PROOF ROLLING OBSERVATION, MOISTURE CONDITIONING & RECOMPACTION, DURING FILL PLACEMENT, EVALUATION OF IN PLACE DENSITY FILL, OBSERVE DRILLING OPERATIONS AND COMPLETE RECORD OF DRILLING, VERIFY PLACEMENTS LOCATIONS AND PLUMBNESS, LENGTH, EMBEDMENT AND ADEQUATE BEARING STRENGTH CAPACITY.

NOTES:

- 1. PROVIDE A SET OF 4 FOR EVERY 75 CY OF BUT NOT LESS THAN 1 / 5,000 SF OF SLAB OR WALL SURFACE AREA. MONITOR SLUMP AND AIR CONTENT OF CONC. AND NOTIFY DELIVERY DRIVER IF SLUMP DEVIATES MORE THAN 1" FROM SPEC'D VALUE. 2. ALL DRILLED AND EPOXIED ANCHORS (REBAR, BOLTS, THREADED RODS ETC.) SHALL BE FULL TESTED TO 110% FOR NO LESS THAN 3 MIN. 3. ADDITIONAL TESTS AT THE CONTRACTOR'S EXPENSE WILL BE PERFORMED TO DETERMINE COMPLIANCE OF REPLACED OR ADDITIONAL WORK WITH SPECIFIED REQUIREMENTS. 4. CORRECT DEFICIENCIES IN WORK THAT TEST REPORTS AND INSPECTIONS INDICATE DO NOT COMPLY WITH THE CONTRACT DOCUMENTS. 5. PROVIDE THE ENGINEER OF RECORD (EOR) COPIES OF ALL SPECIAL INSPECTIONS AS SO A SPECIAL INSPECTIONS REPORT CAN BE PREPARED FOR OBTAINING A CERTIFICATE OF OCCUPANCY.

7. TILT-UP CONCRETE PANEL NOTES

A. PANEL THICKNESS SHALL BE AS NOTED AND SHALL HAVE A SMOOTH FACE, UNLESS OTHERWISE NOTED.

B. ALL PANELS ARE DETAILED AS VIEWED FROM INSIDE.

C. SEE ARCHITECTURAL DRAWINGS FOR EXTERIOR FINISH AND REVEALS.

D. CONCRETE SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS AND 3000 PSI AT THE TIME OF LIFTING. GENERAL CONTRACTOR TO COORDINATE AND VERIFY CONCRETE MIX DESIGN SUBMITTED FOR REVIEW WILL MEET THESE REQUIREMENTS.

E. PANELS SHALL HAVE THE FOLLOWING REINFORCING, UNLESS OTHERWISE NOTED ON THE PANEL ELEVATIONS:

Table with 2 columns: 3/4" THICK PANELS, REINFORCING. Rows include VERTICAL, HORIZONTAL SIDES, TOP, BOTTOM CORNERS.

F. REINFORCE ALL OPENINGS IN PANELS WITH (2) #5 (2 EACH FACE), EXTEND REINFORCEMENT 2'-0" BEYOND CORNERS. PROVIDE (2) #5 X 4'-0" DIAGONALLY @ 45 DEGREE AT ALL OPENING CORNERS IN THE CENTER OF PANEL.

G. PROVIDE CHAIRS EACH WAY AT 48" OC MAXIMUM SUPPORT REINFORCING STEEL IN PLACE.

H. PAY FOR ALL SUBSEQUENT RE-TESTING OF PRODUCTS OR SYSTEMS FOUND TO BE DEFECTIVE OR OTHERWISE NOT IN ACCORDANCE WITH SPECIFICATION REQUIREMENTS. REMOVE REJECTED PRODUCTS AND REPLACE WITH PRODUCTS OF SPECIFIED QUALITY.

I. SEE ARCHITECTURAL DRAWINGS FOR ALL CONNECTIONS OF WOOD AND OTHER MATERIALS.

J. SEE MECHANICAL DRAWINGS FOR ADDITIONAL OPENINGS IN PANELS.

K. THE REINFORCING SHOWN IS FOR IN-PLACE LOADS ONLY. THE CONTRACTOR SHALL PROVIDE DESIGN FOR THE LIFTING INSERTS AND ANY ADDITIONAL REINFORCING STEEL REQUIRED FOR THE LIFTING OPERATION.

L. THE PANEL ELEVATIONS ARE FOR GENERAL ARRANGEMENT ONLY. THE CONTRACTOR SHALL VERIFY ALL WALL PANEL ELEVATIONS FOR DIMENSIONS, OPENINGS, AND EMBED LOCATIONS AND REPORT ANY DISCREPANCIES TO THE STRUCTURAL ENGINEER BEFORE CASTING ANY PANELS.

M. DO NOT SCALE PANELS FOR DIMENSIONS.

N. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR REVIEW BY THE ENGINEER FOR THE REINFORCING STEEL, EMBED PLATES AND PANEL LIFTING INSERTS.

O. FOR EMBED PLATE SIZES REFER TO S4.1 AND FOR EMBED LOCATIONS REFER TO PANEL ELEVATIONS.

P. REINFORCING BRACING OF PANELS SHALL NOT BE REMOVED UNTIL AFTER THE PANEL POUR STRIP HAS BEEN POURED AND ROOF DAPHRAGM CONSTRUCTION HAS BEEN COMPLETED.

Q. INSTALL #4 DOWELS AT 18" OC FROM PANELS TO POUR STRIP.

R. INSTALL #4 DOWELS AT 30" OC FROM PANELS TO SIDEWALKS.

S. CONTRACTOR SHALL FURNISH AND SUBMIT SHOP DRAWINGS FOR REVIEW BY THE ENGINEER ON THE FOLLOWING ITEMS:

- A. REINFORCING STEEL B. EMBEDDED ITEMS FOR PLACEMENT C. PANEL LIFTING INSERTS D. DETAILS FOR TILT-WALL PANELS E. PROPOSED EMBEDDED CONDUIT PLACEMENT



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Project No.: 2330

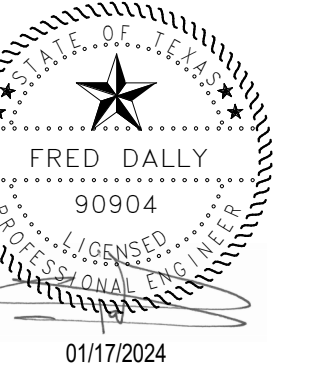
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Revisions: Table with 3 columns: No., Description, Date.

Table with 3 columns: No., Description, Date. Row 1: 1, 100%CD, 01.17.2024

GENERAL STRUCTURAL CRITERIA S101 DAILY + ASSOCIATES 8900 Richmond Avenue, Suite 460 Houston, Texas 77042 1 713 337 8881 Texas Registered Engineering Firm F-003426



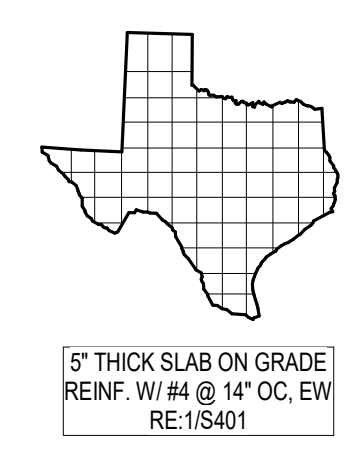
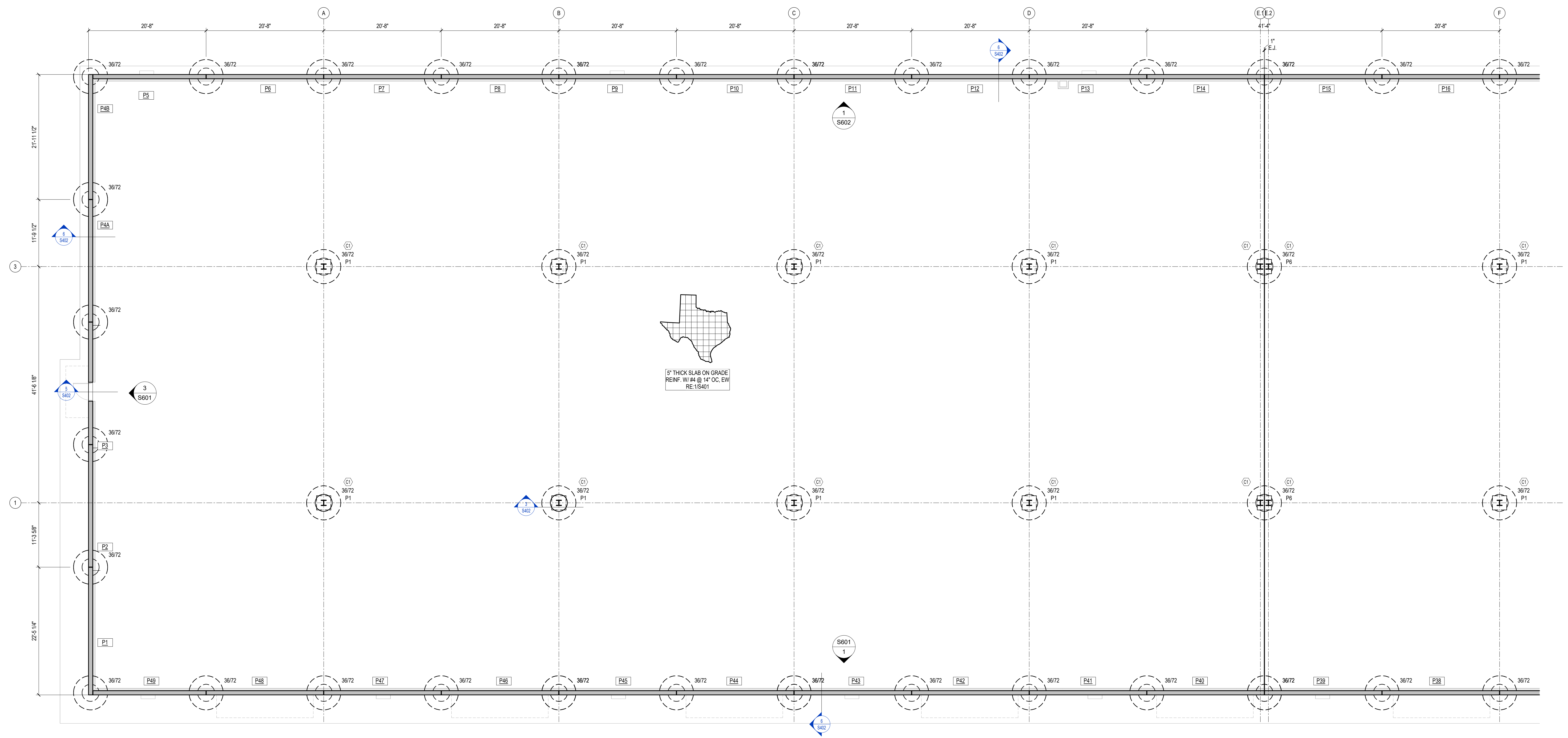
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- FOUNDATION NOTES:**
1. DATUM ELEVATION <math>-0' </math> CORRESPONDS TO TRUE ELEVATION = RE: CIVIL. ALL ELEVATIONS ARE RELATIVE TO DATUM ELEVATION <math>-0' </math>.
  2. "1836" (EXAMPLE) INDICATES DRILLED PIER SHAFT AND BELL SIZE. ALL INTERIOR DRILLED PIERS ARE AT ELEVATION <math>-2' </math> TYP. UON. ALL EXTERIOR DRILLED PIERS ARE AT ELEVATION <math>-2' </math> TYP. UON. ALL INTERMEDIATE PIERS ARE CENTERED BETWEEN GRIDS ON THE GRADE BEAM. TYP. UON. FOR DRILLED PIER SCHEDULE & DETAILS RE: S301.
  3. " (C1) " (EXAMPLE) INDICATES COLUMN SIZE. "BPI1" (EXAMPLE) INDICATES BASE PLATE TYPE. FOR COLUMN, BASE PLATE & ANCHOR BOLT SCHEDULE RE: S302. PROVIDE TYPICAL BLOCKOUTS AT EACH COLUMN PER DETAILS 6, 7, 8 & 9/5401, TYP. UON.
  4. PROVIDE CONTROL JOINTS AT EVERY COLUMN LINE AND AT A MAXIMUM SPACING OF 36 TIMES THE SLAB THICKNESS (NOT TO EXCEED 19'-0"), TYPICAL UON. FOR ADDITIONAL INFORMATION RE: 3/5401.
  5. PROVIDE ADDITIONAL REINFORCING AT ALL RE-ENTRANT CORNERS PER 5/5401.
  6. TYPICAL LIGHT POLE FOUNDATION DETAIL RE: 1/5402.
  7. VERIFY ALL SLOPES, DEPRESSIONS, ELEVATIONS WITH ARCH. PRIOR TO CONSTRUCTION.
  8. COLUMNS OUTSIDE THE BUILDING FOOTPRINT GO TO COORDINATE WITH CIVIL DRAWINGS TO DETERMINE THE BASEPLATE ELEVATION AS REQUIRED PER THE PAVING/ SIDEWALK SLOPE.
  9. "P1" (EXAMPLE) INDICATES PLINTH TYPE. ALL INTERIOR PLINTHS ARE TYPE "P1" UON. ALL PERIMETER PLINTHS ARE TYPE "P2" UON. ALL CORNER PLINTHS ARE TYPE "P3" UON. T.O. PLINTHS ARE AT <math>-0' </math> TYP. UON. FOR PLINTH SCHEDULE & DETAILS RE: S301.



15" THICK SLAB ON GRADE  
REINF: W #4 @ 14" OC, EW  
RE: 1/5401

**1 FOUNDATION FLOOR PLAN AREA A**  
1/8" = 1'-0"

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**KEY PLAN**

PLAN NORTH TRUE NORTH

Project No.: 2330

Drawing Date: 01.17.2024  
Drawn: MR  
Checked: SI  
Scale: AS NOTED

Issue Log:

No.	Description	Date
1	100%CD	01.17.2024

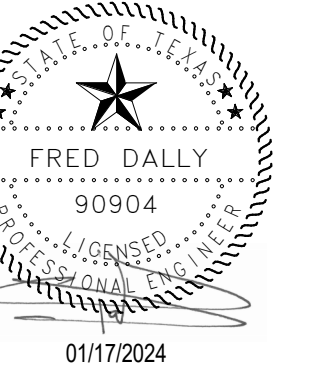
Revisions:

No.	Description	Date

**FOUNDATION FLOOR PLAN AREA A**

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**S211**



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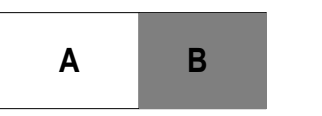
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**KEY PLAN**  
PLAN NORTH  
TRUE NORTH

**Project No.: 2330**

Drawing Date: 01/17/2024  
Drawn: MR  
Checked: SJ  
Scale: AS NOTED

**Issue Log:**

No.	Description	Date
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**Revisions:**

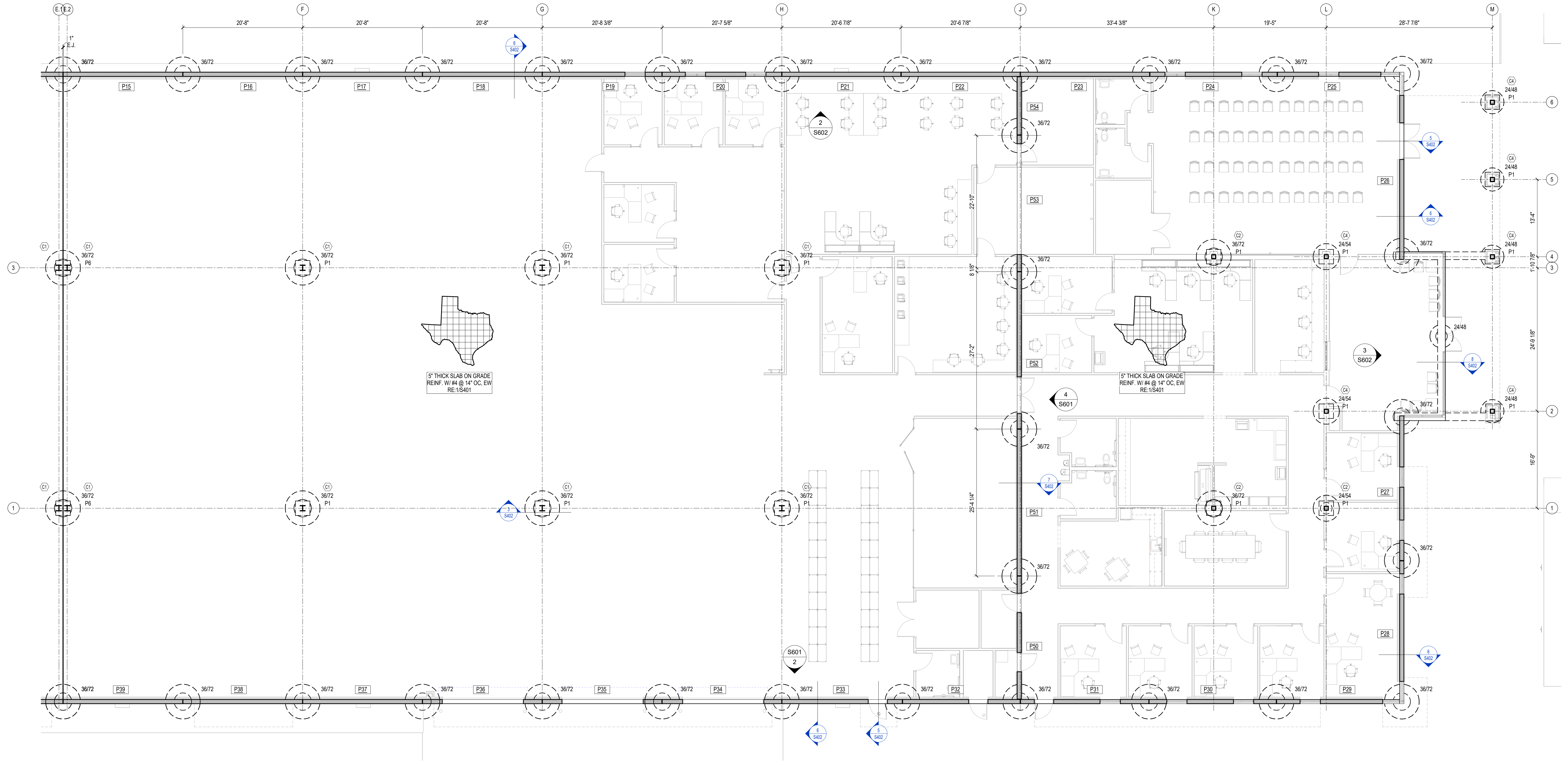
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**FOUNDATION FLOOR PLAN AREA B - ADMIN**



**S212**

- FOUNDATION NOTES:**
- DATUM ELEVATION <'-0'> CORRESPONDS TO TRUE ELEVATION = RE: CIVIL. ALL ELEVATIONS ARE RELATIVE TO DATUM ELEVATION <'-0'>.
  - 18"Ø6" (EXAMPLE) INDICATES DRILLED PIER SHAFT AND BELL SIZE. ALL INTERIOR DRILLED PIERS ARE AT ELEVATION <-2'-6"> TYP. UON. ALL EXTERIOR DRILLED PIERS ARE AT ELEVATION <-2'-6"> TYP. UON. ALL INTERMEDIATE PIERS ARE CENTERED BETWEEN GRIDS ON THE GRADE BEAM. TYP UON FOR DRILLED PIER SCHEDULE & DETAILS RE: S301.
  - Ø (EXAMPLE) INDICATES COLUMN SIZE. 18"Ø1" (EXAMPLE) INDICATES BASE PLATE TYPE. FOR COLUMN BASE PLATE & ANCHOR BOLT SCHEDULE RE: S302. PROVIDE TYPICAL BLOCKOUTS AT EACH COLUMN PER DETAILS 6, 7, & 8 ØS401, TYP UON.
  - PROVIDE CONTROL JOINTS AT EVERY COLUMN LINE AND AT A MAXIMUM SPACING OF 36 TIMES THE SLAB THICKNESS (NOT TO EXCEED 15'-0") TYPICAL UON. FOR ADDITIONAL INFORMATION RE: S3401.
  - PROVIDE ADDITIONAL REINFORCING AT ALL RE-ENTRANT CORNERS PER S5401.
  - TYPICAL LIGHT POLE FOUNDATION DETAIL RE: 1S402.
  - VERIFY ALL SLOPES, DEPRESSIONS, ELEVATIONS WITH ARCH. PRIOR TO CONSTRUCTION.
  - COLUMNS OUTSIDE THE BUILDING FOOTPRINT, GC TO COORDINATE WITH CIVIL DRAWINGS TO DETERMINE THE BASEPLATE ELEVATION AS REQUIRED PER THE PAVING/ SIDEWALK SLOPE.
  - Ø1" (EXAMPLE) INDICATES PLINTH TYPE. ALL INTERIOR PLINTHS ARE TYPE "P1" UON. ALL PERIMETER PLINTHS ARE TYPE "P2" UON. ALL CORNER PLINTHS ARE TYPE "P3" UON. T.O. PLINTHS ARE AT <-0'-0"> TYP. UON. FOR PLINTH SCHEDULE & DETAILS RE: S301.



**1 FOUNDATION FLOOR PLAN AREA B - ADMIN**  
1/8" = 1'-0"



PROVIDE AN ALLOWANCE FOR ADDITIONAL 15 TONS OF MISCELLANEOUS STEEL FOR THE ENTIRE PROJECT (SIZES AS DIRECTED BY THE ARCHITECT) FOR TO BE USED IN THE FIELD AS DIRECTED BY THE ARCHITECT FOR AND SHALL INCLUDE ALL THE ASSOCIATED DETAILING, LABOR, ERECTION, AND ANY OVERHEAD COST. ANY UNUSED PORTION OF THE QUANTITY SHALL BE CREDITED TO THE OWNER AT THE SAME RATE.

- STEEL ROOF FRAMING NOTES:**
1. ALL ELEVATIONS ARE RELATIVE TO DATUM ELEVATION.
  2. " DECK " (EXAMPLE INDICATES ROOF DECK SPAN TYPE 1 DIRECTION AND DECK TYPE 2. TOS ELEVATION AT ROOF DECKS ARE AT 800. TYP. UON. FOR DECK TYPE INFORMATION RE: 7 (S901)
  3. COORDINATE LOCATIONS AND SIZES OF ALL CHASES AND PENETRATIONS WITH MEP. COORDINATE EXACT LOCATION OF ALL MEP UNITS WITH MEP. FOR FRAMING AROUND ROOF OPENINGS RE: 7 (S905)
  4. FOR BRACE ELEVATIONS AND DETAILS RE: S901
  5. TILT-WALL ELEVATIONS RE: S903, S904 & S905
  6. PROVIDE KCS JOISTS BELOW RTU. KCS JOISTS TO MATCH SAME K-SIZE JOISTS OR LARGER IF SMALLER SIZE IS NOT APPLICABLE. GC TO COORDINATE WITH MEP DRAWINGS FOR EXACT LOCATIONS. WHERE LH JOIST SUPPORTING RTU UNITS, JOISTS MANUFACTURE TO DESIGN THE LH JOIST WITH 250 LB/FT ADDITIONAL LOAD.
  7. BEAMS ADJACENT TO LONG SPAN JOISTS TO BE CAMBERED MATCHING JOISTS CAMBER.
  8. L3X3X1/4 BRACING @ 8'-0" OC TO BE PROVIDED AT THE LONG SPAN FROM BEAMS BOTTOM FLANGE TO ADJACENT JOIST TOP CHORD.
  9. WHERE K-JOISTS AND LH JOIST BEAR ON SAME BEAM K-JOIST SEAT TO MATCH LH JOISTS SEAT.
  10. DP DENOTES TO DOUBLE PITCHED JOISTS
  11. ALL EXTERIOR EXPOSED STEEL TO BE HOT DIPPED GALVANIZED. BEAMS SUBJECT TO MOMENT CONNECTIONS AND RUNNING PARALLEL TO FLOOR BEAMS. PROVIDE L3 X 3 X 1/4 KICKERS AT 5'-0" O.C. FROM BEAM BOTTOM FLANGES TO ADJACENT BEAM TOP FLANGES.



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**KEY PLAN**  
 PLAN NORTH TRUE NORTH

Project No.: 2330

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**Issue Log:**

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**Revisions:**

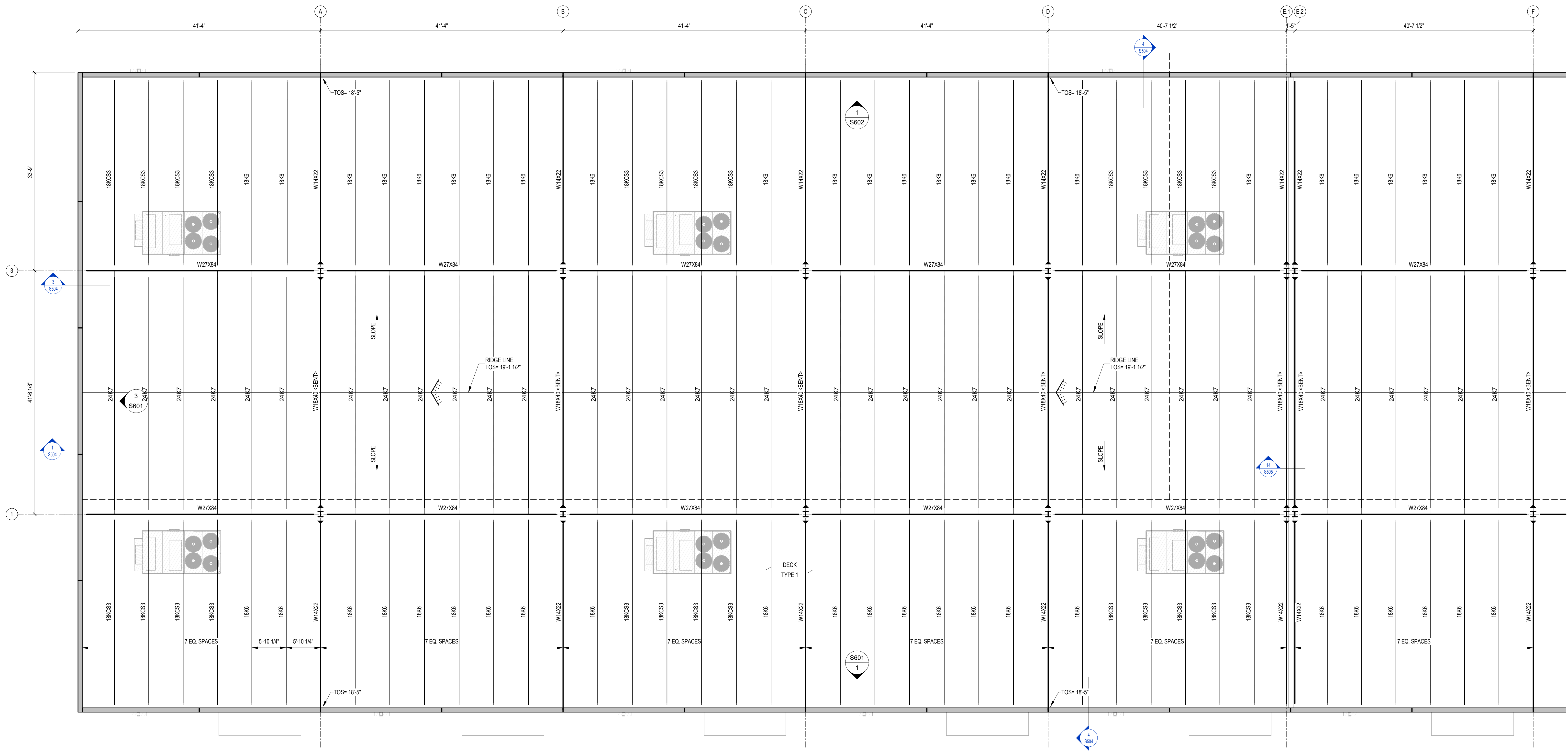
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**FRAMING PLAN AREA A**



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**S221**



**1 ROOF FRAMING PLAN - AREA A**  
 1/8" = 1'-0"

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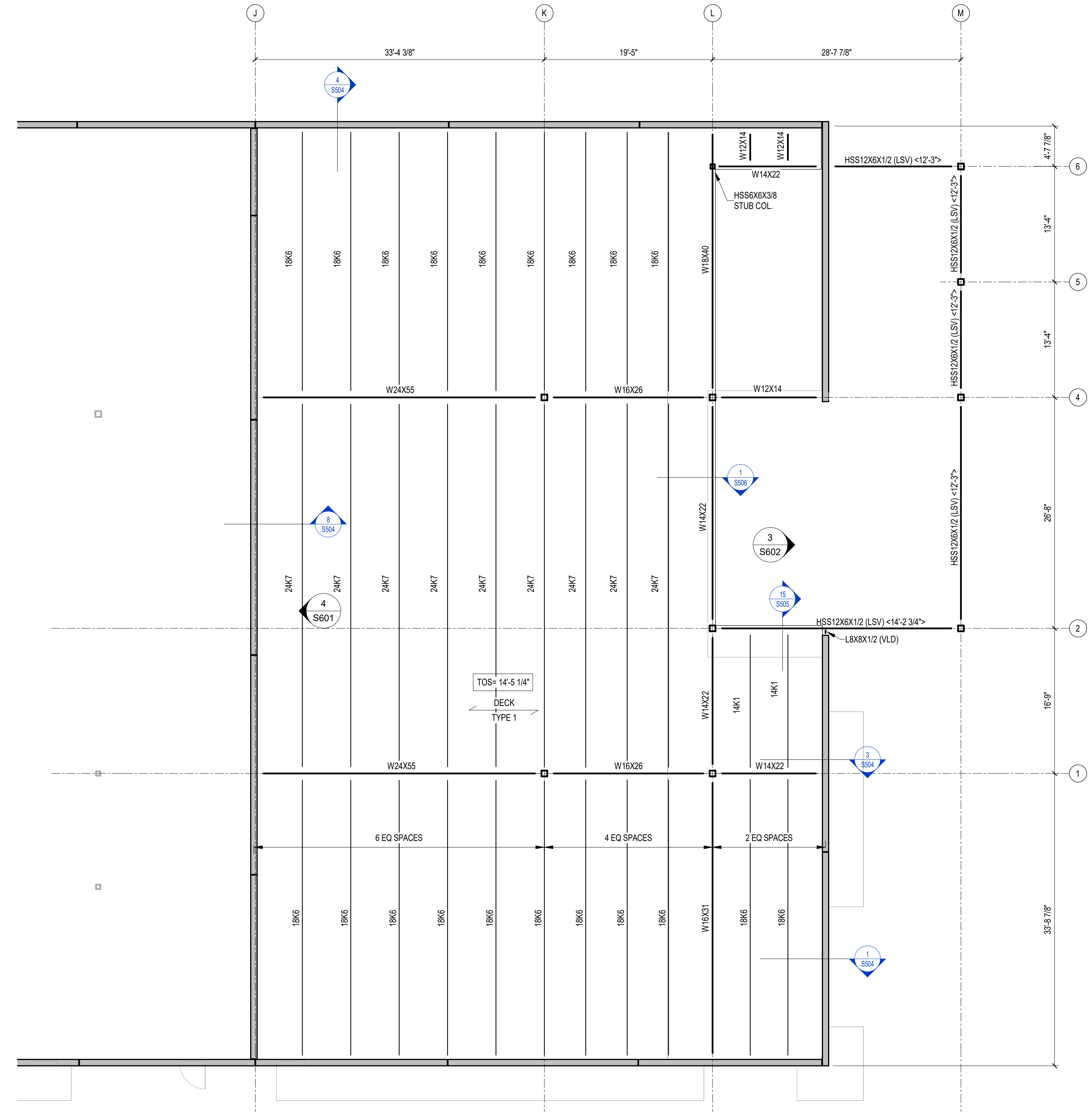
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**LO ROOF FRAMING  
PLAN AREA B -  
ADMIN**

**S222**

PROVIDE AN ALLOWANCE FOR ADDITIONAL 15 TONS OF MISCELLANEOUS STEEL FOR THE ENTIRE PROJECT (SIZES AS DIRECTED BY THE ARCHITECT/ EOR) TO BE USED IN THE FIELD AS DIRECTED BY THE ARCHITECT/ EOR AND SHALL INCLUDE ALL THE ASSOCIATED DETAILING, LABOR, ERECTION, AND ANY OVERHEAD COST. ANY UNUSED PORTION OF THE QUANTITY SHALL BE CREDITED TO THE OWNER AT THE SAME RATE.

- STEEL ROOF FRAMING NOTES:**
1. ALL ELEVATIONS ARE RELATIVE TO DATUM ELEVATION.
  2. DECK TYPE 1 (EXAMPLE) INDICATES ROOF DECK SPAN DIRECTION AND DECK TYPE 2 TOS ELEVATION AT ROOF DECKS ARE AT BOB, TYP. UN FOR DECK TYPE INFORMATION RE: 7/891
  3. COORDINATE LOCATIONS AND SIZES OF ALL CHASES AND PENETRATIONS WITH MEP. COORDINATE EXACT LOCATION OF ALL MEP UNITS WITH MEP. FOR FRAMING AROUND ROOF OPENINGS RE: 7/898
  4. FOR BRACE ELEVATIONS AND DETAILS RE: 891
  5. TILT-WALL ELEVATIONS RE: 863, 864 & 865
  6. PROVIDE KCS JOISTS BELOW RTU. KCS JOISTS TO MATCH SAME K-SIZE JOISTS OR LARGER IF SMALLER SIZE IS NOT APPLICABLE. GC TO COORDINATE WITH MEP DRAWINGS FOR EXACT LOCATIONS. WHERE LH JOISTS SUPPORTING RTU UNITS, JOISTS MANUFACTURE TO DESIGN THE LH JOIST WITH 250 LB/FT ADDITIONAL LOAD.
  7. BEAMS ADJACENT TO LONG SPAN JOISTS TO BE CAMBERED MATCHING JOISTS CAMBER.
  8. L3X3X1/4" BRACING @ 6'-0" OC TO BE PROVIDED AT THE LONG SPAN FROM BEAMS BOTTOM FLANGE TO ADJACENT JOIST TOP CHORD.
  9. WHERE K-JOISTS AND LH JOIST BEAR ON SAME BEAM K-JOIST SEAT TO MATCH LH JOISTS SEAT.
  10. DP DENOTES TO DOUBLE PITCHED JOISTS
  11. ALL EXTERIOR EXPOSED STEEL TO BE HOT DIPPED GALVANIZED. BEAMS SUBJECT TO MOMENT CONNECTIONS AND RUNNING PARALLEL TO FLOOR BEAMS. PROVIDE 1 1/2" X 3" X 1/4" KICKERS AT 5'-0" O.C. FROM BEAM BOTTOM FLANGES TO ADJACENT BEAM TOP FLANGES.



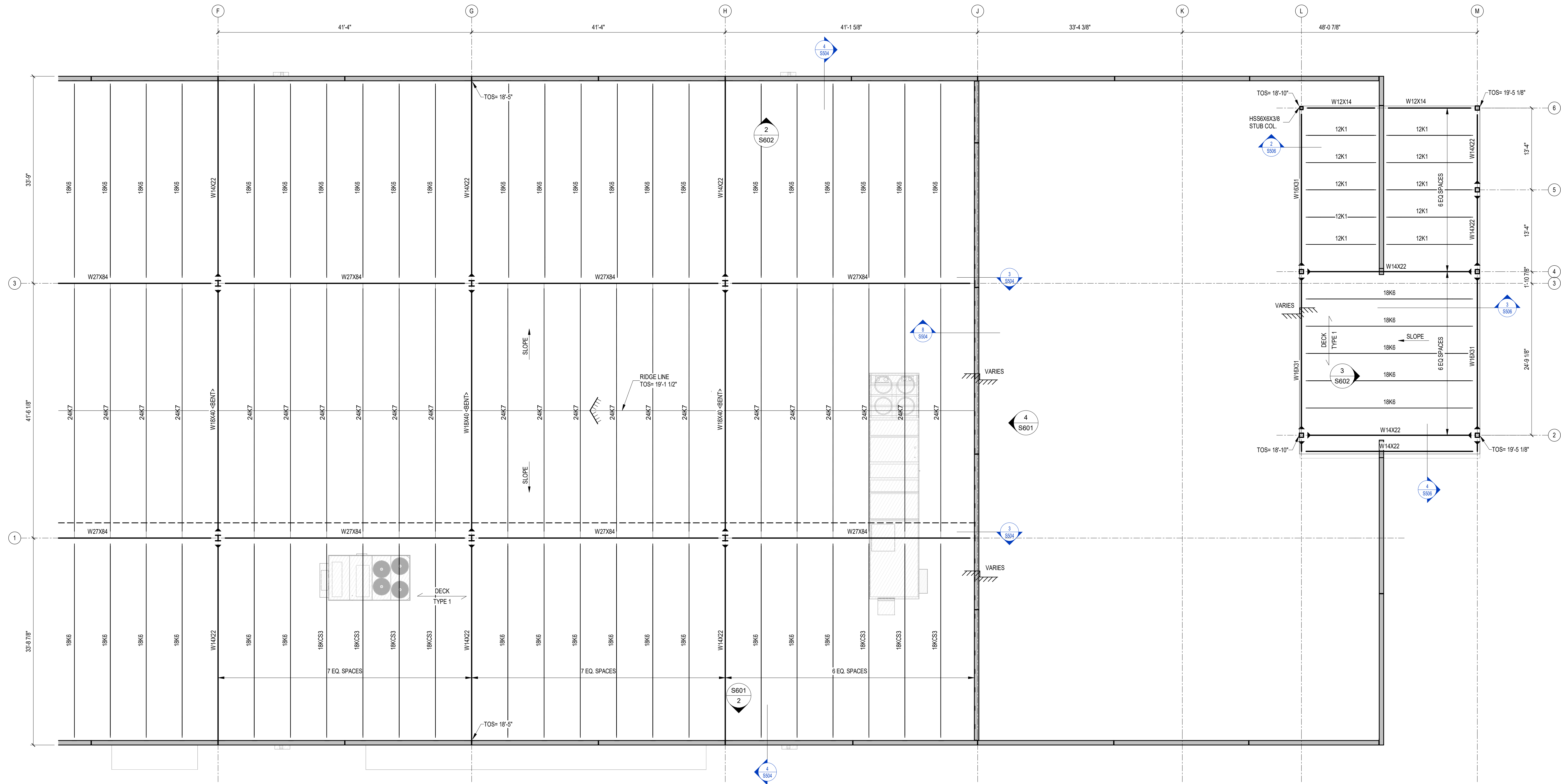
**2 LO ROOF FRAMING PLAN AREA B**  
1/8" = 1'-0"

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PROVIDE AN ALLOWANCE FOR ADDITIONAL 15 TONS OF MISCELLANEOUS STEEL FOR THE ENTIRE PROJECT (SIZES AS DIRECTED BY THE ARCHITECT) FOR BE USED IN THE FIELD AS DIRECTED BY THE ARCHITECT/ EOR AND SHALL INCLUDE ALL THE ASSOCIATED DETAILING, LABOR, ERECTION, AND ANY OVERHEAD COST. ANY UNUSED PORTION OF THE QUANTITY SHALL BE CREDITED TO THE OWNER AT THE SAME RATE.

**STEEL ROOF FRAMING NOTES:**

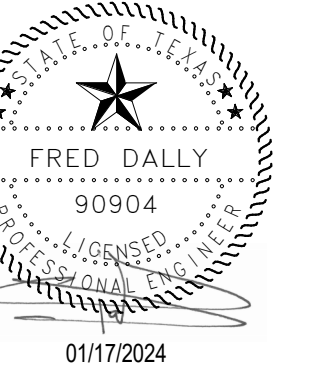
- ALL ELEVATIONS ARE RELATIVE TO DATUM ELEVATION.
- DECK TYPE 1 (EXAMPLE) INDICATES ROOF DECK SPAN DIRECTION AND DECK TYPE 2 TOS ELEVATION AT ROOF DECKS ARE AT BOD. TYP. UON. FOR DECK TYPE INFORMATION **RE: 7.1(S)01**
- COORDINATE LOCATIONS AND SIZES OF ALL CHASES AND PENETRATIONS WITH MEP. COORDINATE EXACT LOCATION OF ALL MEP UNITS WITH MEP. FOR FRAMING AROUND ROOF OPENINGS **RE: 7.1(S)05**
- FOR BRACE ELEVATIONS AND DETAILS **RE: S601**
- TILT-WALL ELEVATIONS **RE: S601, S604 & S605**
- PROVIDE KCS JOISTS BELOW RTU. KCS JOISTS TO MATCH SAME K-SIZE JOISTS OR LARGER IF SMALLER SIZE IS NOT APPLICABLE. GC TO COORDINATE WITH MEP DRAWINGS FOR EXACT LOCATIONS. WHERE LH JOISTS SUPPORTING RTU UNITS, JOISTS MANUFACTURE TO DESIGN THE LH JOIST WITH 250 LB/FT ADDITIONAL LOAD.
- BEAMS ADJACENT TO LONG SPAN JOISTS TO BE CAMBERED MATCHING JOISTS CAMBER.
- L3X3X1/4" BRACING @ 6' O.C. TO BE PROVIDED AT THE LONG SPAN FROM BEAMS BOTTOM FLANGE TO ADJACENT JOIST TOP CHORD.
- WHERE K JOISTS AND LH JOIST BEAR ON SAME BEAM K-JOIST SEAT TO MATCH LH JOISTS SEAT.
- DP DENOTES TO DOUBLE PITCHED JOISTS
- ALL EXTERIOR EXPOSED STEEL TO BE HOT DIPPED GALVANIZED. BEAMS SUBJECT TO MOMENT CONNECTIONS AND RUNNING PARALLEL TO FLOOR BEAMS. PROVIDE L3' X 3' X 1/4" KICKERS AT 5'-0" O.C. FROM BEAM BOTTOM FLANGES TO ADJACENT BEAM TOP FLANGES.



**1** ENLARGED FRAMING PLAN - AREA B ADMIN  
1/8" = 1'-0"



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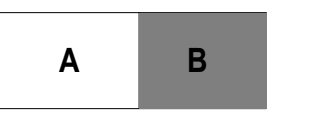
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**KEY PLAN**  
PLAN NORTH  
TRUE NORTH

Project No.: 2330

Drawing Date: 01/17/2024  
Drawn: MR  
Checked: SJ  
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HI ROOF FRAMING  
PLAN AREA B -  
ADMIN



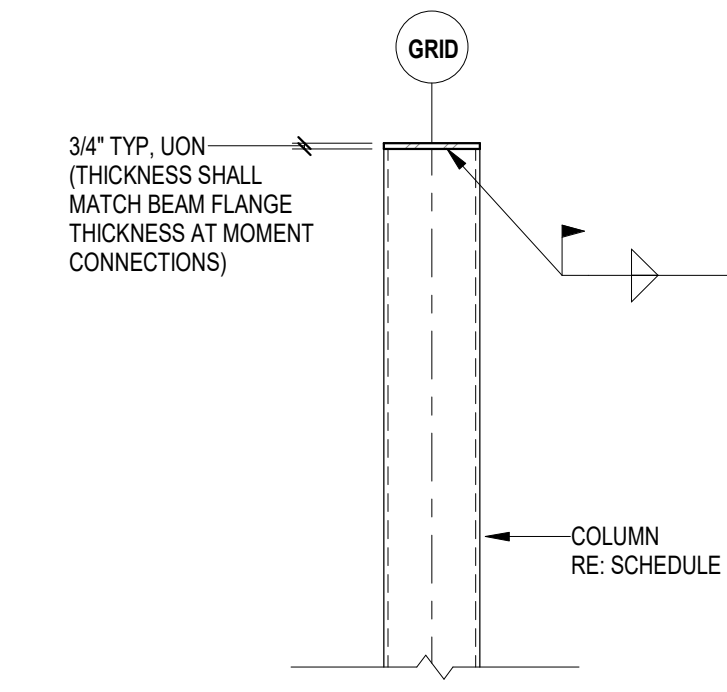
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F-003426

**S223**

# 1. STRUCTURAL STEEL COLUMN SCHEDULE AND DETAILS

LEVEL	COLUMN MARK	C1	C2	C3									
<b>CAP PLATE DETAIL</b>													
HI ROOF AT ENTRANCE BOD ELEVATION = EL +XX'-0" (F.V.)													
ROOF = +XX'-0" (F.V.) TOC ELEVATION = RE: PLAN													
LO ROOF AREA B - ADMIN = +XX'-0" (F.V.) TOC ELEVATION = RE: PLAN													
DATUM F.F. EL. 0'-0" = RE: G.C. (F.V.) 0'-0"													
BOTTOM OF BASE PLATE EL.		-6'-10"	-6'-10"	-6'-10"									
BASE PLATE MARK		BP3	BP2	BP3									
REMARKS		-	-	-									

## A. TYPICAL COLUMN CAP PLATE DETAIL (NO SCALE)

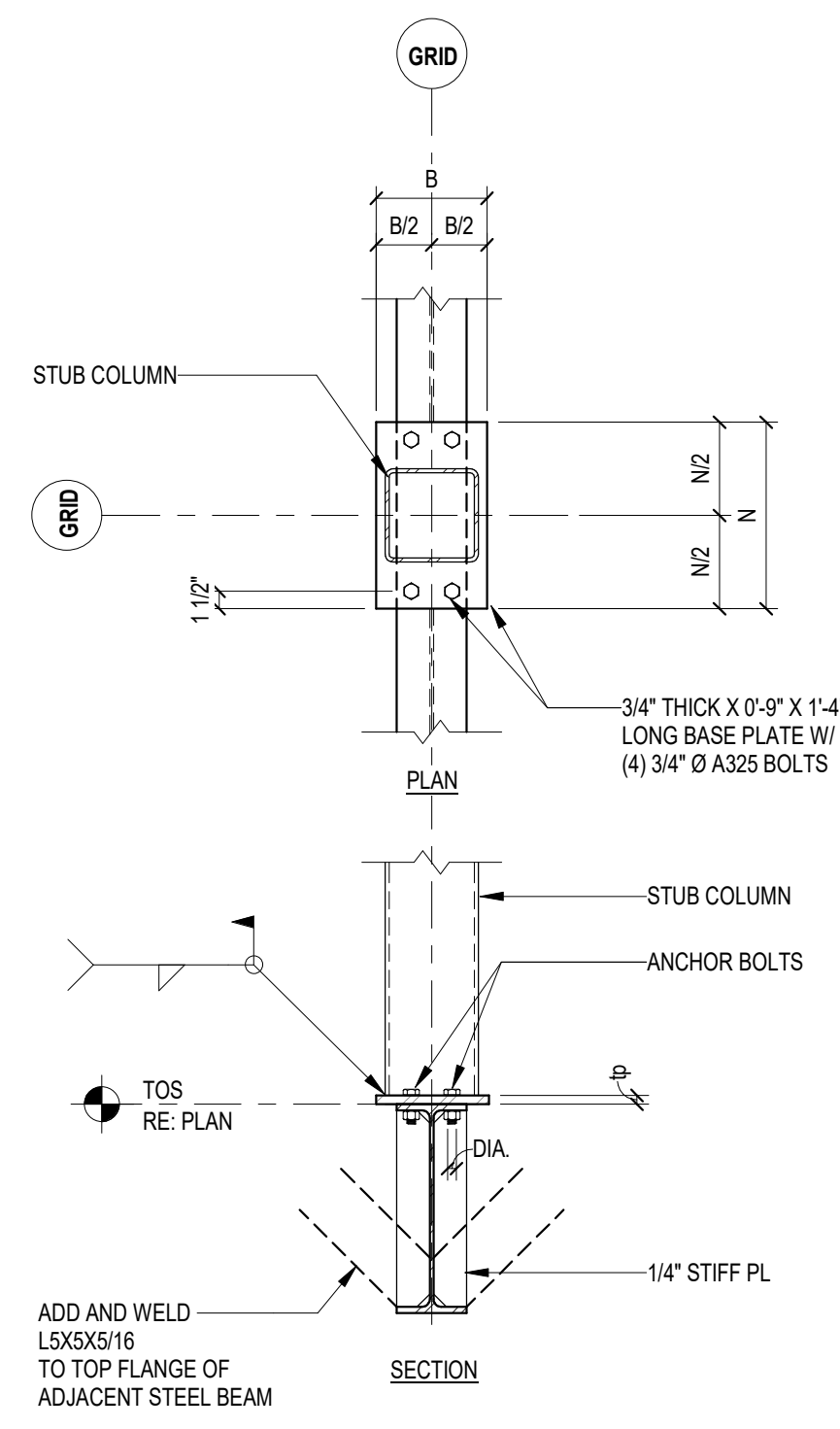


## B. COLUMN GENERAL NOTES

1. PROVIDE STRUCTURAL STEEL FOR W SHAPES CONFORMING TO ASTM 992, GRADE 50.
2. PROVIDE STRUCTURAL STEEL FOR HSS COLUMNS CONFORMING TO ASTM A500, GRADE B.
3. PROVIDE STEEL FOR STIFFENER PLATES, CONNECTION PLATES AND ANGLES CONFORMING TO ASTM A36.
4. SAW OR MILL SURFACES NOTED FIN. (FINISHED) FOR TRUE AND FULL CONTACT.
5. USE E70XX WELDING ELECTRODES FOR ALL WELDS, UNLESS OTHERWISE NOTED.
6. PROVIDE WEB DOUBLER PLATES IF REQUIRED TO SATISFY DESIGN DEMANDS.

## C. COLUMN REMARKS

## D. STUB COLUMN BASE PLATE DETAIL (NO SCALE)



## E. BASE PLATE GENERAL NOTES

1. PROVIDE STEEL FOR BASE PLATES CONFORMING TO GRADE 50
2. PROVIDE HOLES IN BASE PLATES IN ACCORDANCE WITH ABC 14TH EDITION.
3. PROVIDE ANCHOR RODS CONFORMING TO ASTM F1554, GRADE 55 WELDABLE.
4. PROVIDE ANCHOR RODS WITH PLATE WASHERS AND HEX NUTS.
5. USE E70XX WELDING ELECTRODES FOR ALL WELDS, UNLESS OTHERWISE NOTED.
6. MILL SURFACES NOTED FIN. (FINISHED) FOR TRUE AND FULL CONTACT.
7. SET ANCHOR RODS WITH TEMPLATE.
8. PROVIDE NON-METALLIC SHRINK-RESISTANT GROUT WITH 8000 PSI MINIMUM COMPRESSIVE STRENGTH AT 28-DAYS.

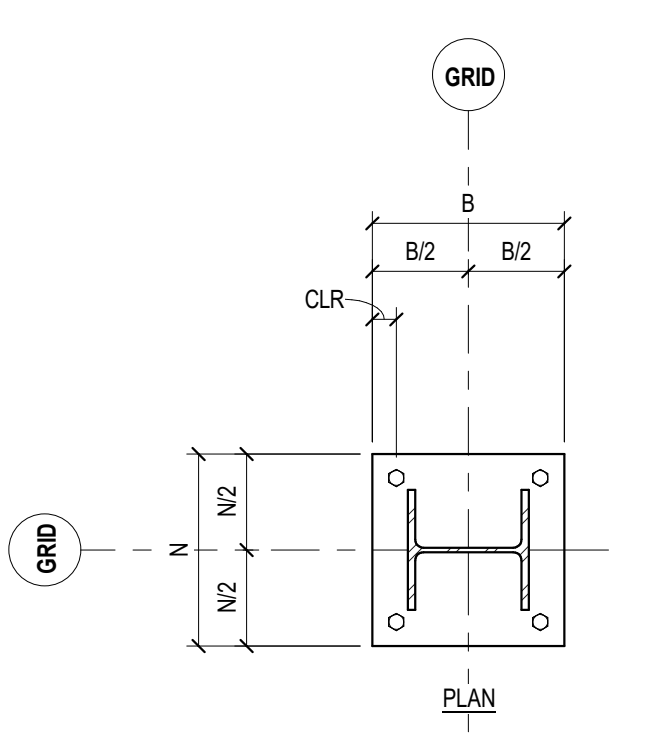
# 2. BASE PLATE SCHEDULE AND DETAILS

MARK	PLATE TYPE	DIMENSIONS			ANCHOR RODS				WELD SIZE	REMARKS
		B (IN)	N (IN)	lb (IN)	NUMBER	DIA (IN)	PROJECTION P (IN)	LENGTH L (IN)		
BP1	B	16	16	1-1/4"	4	1"	6	2'-2"	5/16	
BP2	B	14	14	1-1/4"	6	1"	6	2'-2"	5/16	
BP3	B	18	18	1-1/4"	4	1 1/4"	6	2'-2"	5/16	

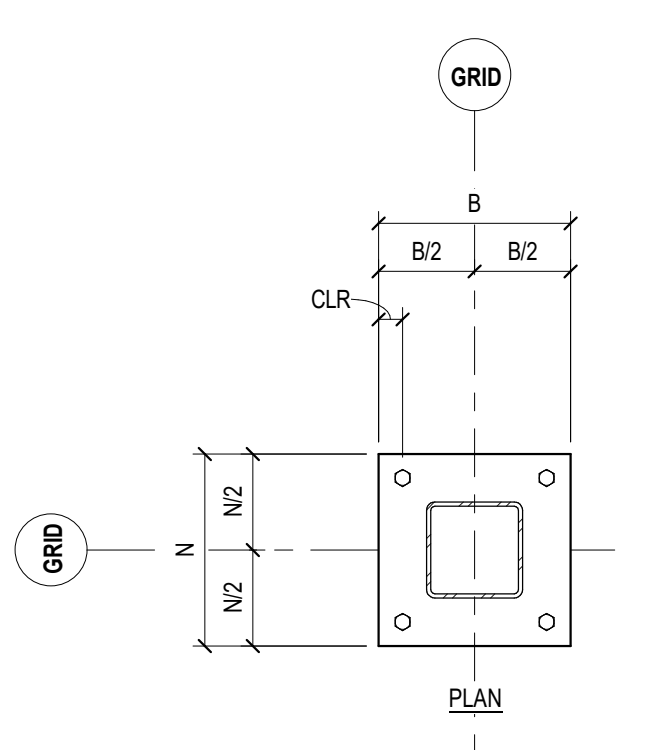
TYPICAL ANCHOR ROD CLEARANCE SCHEDULE

ROD Ø	CLEAR DIM
1"	2"
1 1/4"	2-1/4"
1-1/2"	2-1/2"

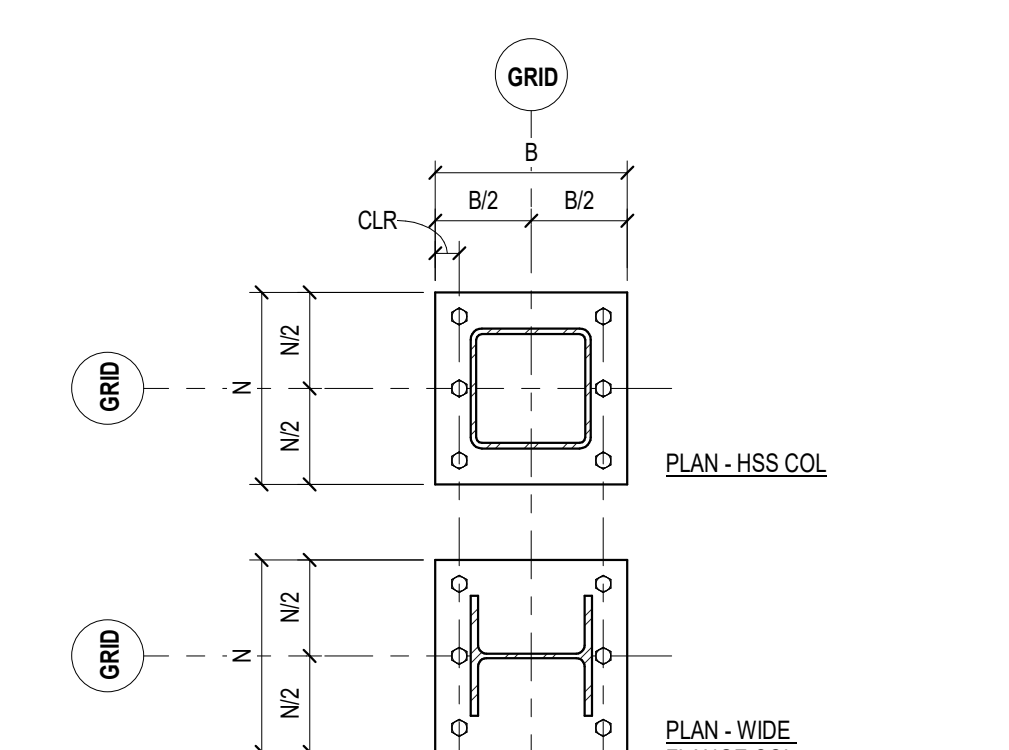
NOTED AS "CLR" ON BASEPLATE DETAILS



**TYPE A**



**TYPE B**



**TYPE C**



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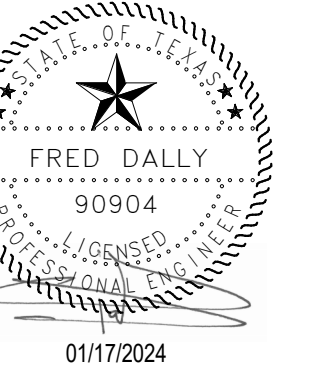


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# STEEL COLUMN SCHEDULE & DETAILS

**S302**

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**DRILLED SHAFT PIER SCHEDULE**

SHAFT DIAMETER	VERTICAL REINFORCING		TIES		REMARKS
	NUMBER	SIZE	SIZE	SPACING (IN)	
18	6	#5	#4	12	
24	6	#6	#4	12	
30	6	#8	#4	12	
36	8	#8	#4	12	

**DRILLED SHAFT PIER GENERAL NOTES**

- A GEOTECHNICAL REPORT IS AVAILABLE FOR REVIEW
- THE INDEPENDENT TESTING LABORATORY SHALL CONFIRM THE ALLOWABLE SOIL BEARING CAPACITY IN THE FIELD AT THE ELEVATION DESIGNATED AS THE PLANE OF BEARING FOR THE DRILLED PIER.
  - ALLOWABLE BEARING PRESSURE OF 3500 PSF
- THE INDEPENDENT TESTING LABORATORY SHALL INSPECT THE BOTTOM AND SIDES OF THE DRILLED PIER PRIOR TO PLACING REINFORCING AND CONCRETE.
- CENTER ALL DRILLED PIERS UNDER THEIR COLUMNS, UON.
- MAINTAIN CLOSE AND ACCURATE DRILLING PRACTICES TO ACHIEVE CLOSE TOLERANCES WITH THE REINFORCING STEEL AND THE ANCHOR ROD TEMPLATE.
- ALL REINFORCING STEEL FOR DRILLED PIERS SHALL BE DEFORMED NEW BILLET STEEL CONFORMING TO ASTM A615, GRADE 60.
- ALL SCHEDULED REINFORCEMENT SHALL BE UNIFORMLY DISTRIBUTED.
- DEPOSIT CONCRETE TO ITS FINAL POSITION BY THE USE OF A TREMIE.
- CONSOLIDATE CONCRETE IN ITS FINAL POSITION BY VIBRATING.

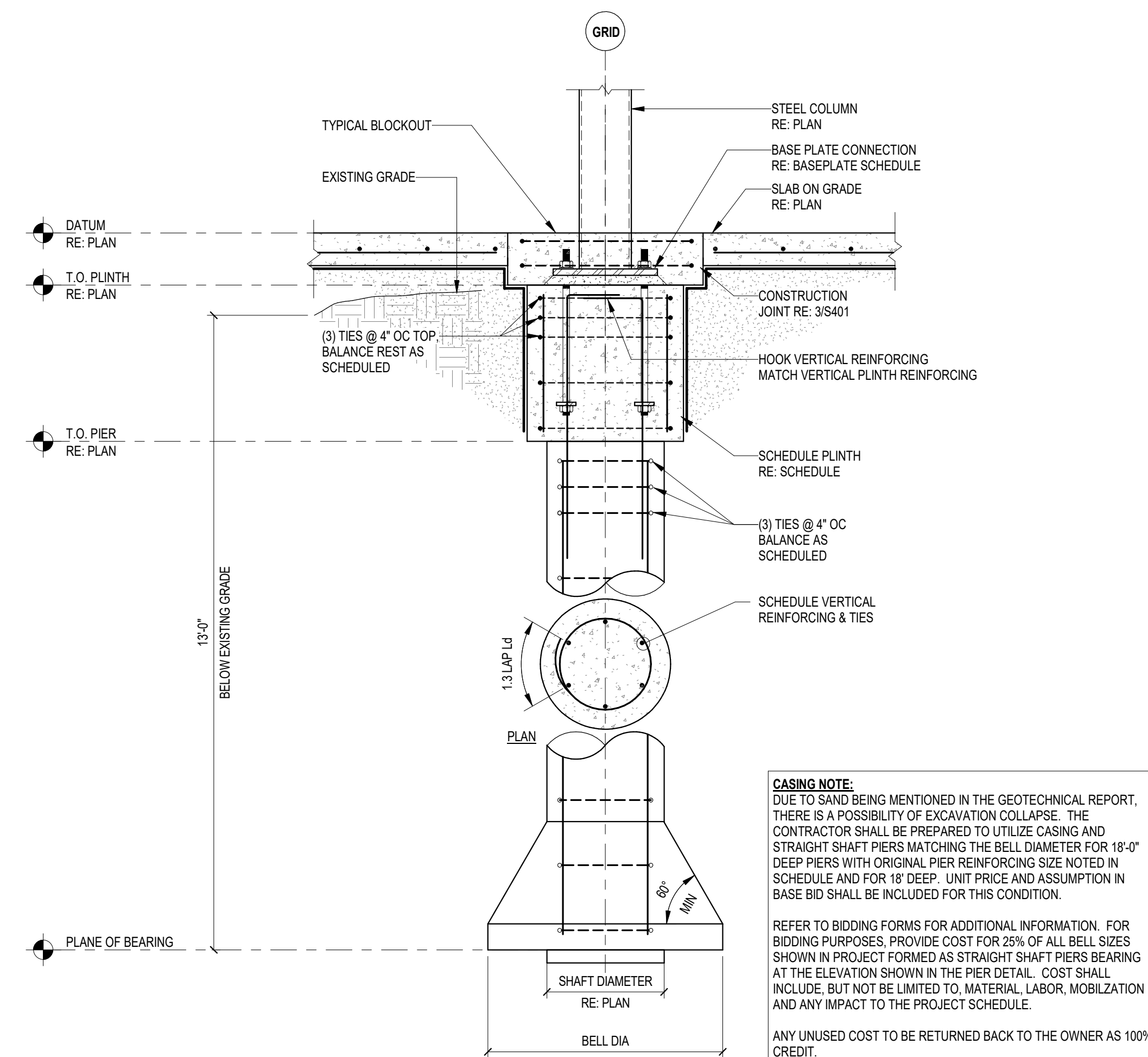
**2. PLINTH SCHEDULE**

MARK	PLINTH TYPE	REINFORCING		REMARKS
		VERTICAL	TIES	
P1, P1A	TYPE 1	(12) #7	#4 @ 10" O.C.	
P2, P2A	TYPE 2	(12) #7	#4 @ 10" O.C.	
P3, P3A, P3B, P3C, P3D	TYPE 3	(12) #8	#4 @ 10" O.C.	

**2B. PLINTH GENERAL NOTES**

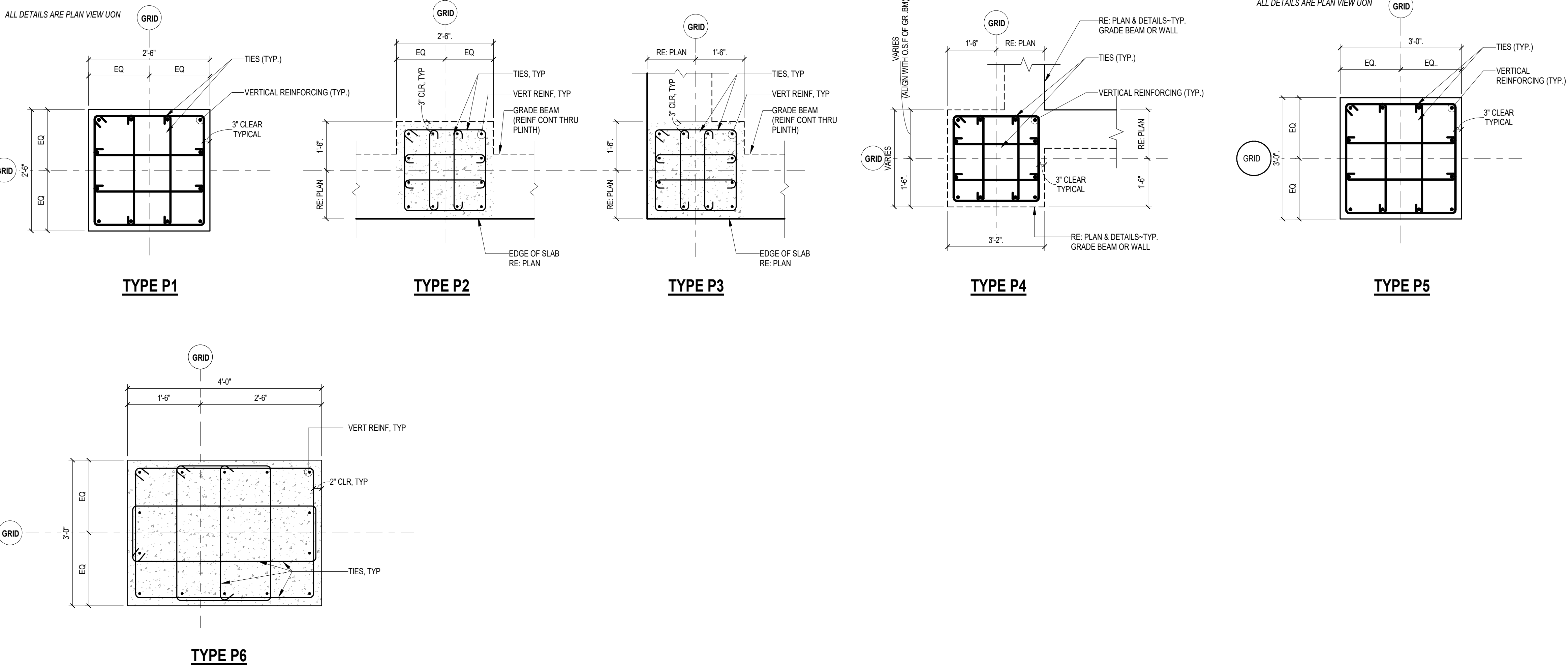
- RE: PLAN FOR TYPE AND ORIENTATION OF PLINTHS.
- WHERE A PLINTH IS INTEGRAL WITH A BEAM, EXTEND THE HORIZONTAL REINFORCING THROUGH THE PLINTH.

**DRILLED SHAFT PIER DETAILS**



**2A. PLINTH DETAILS CONT.**

**2A. PLINTH DETAILS**



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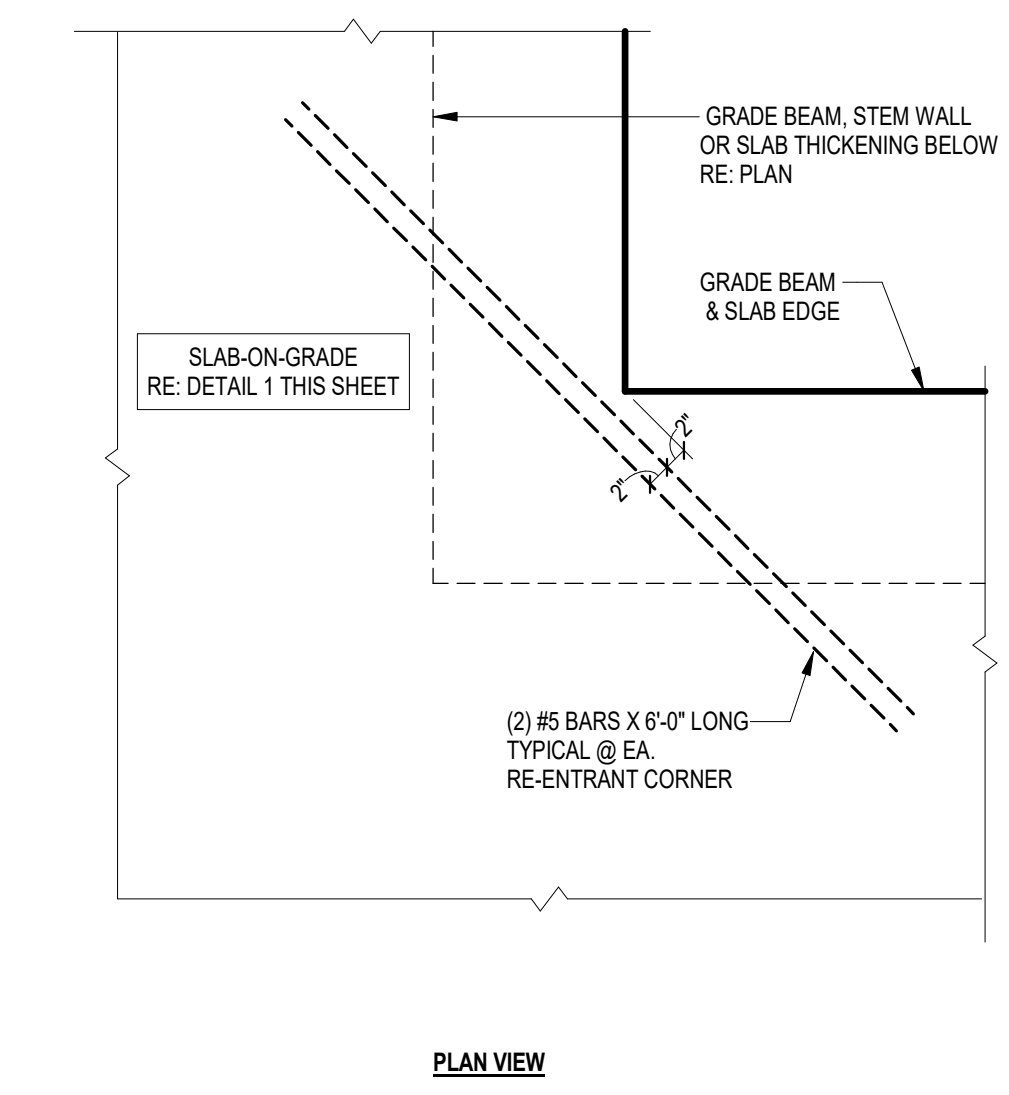
No.	Description	Date

TYPICAL  
FOUNDATION  
DETAILS

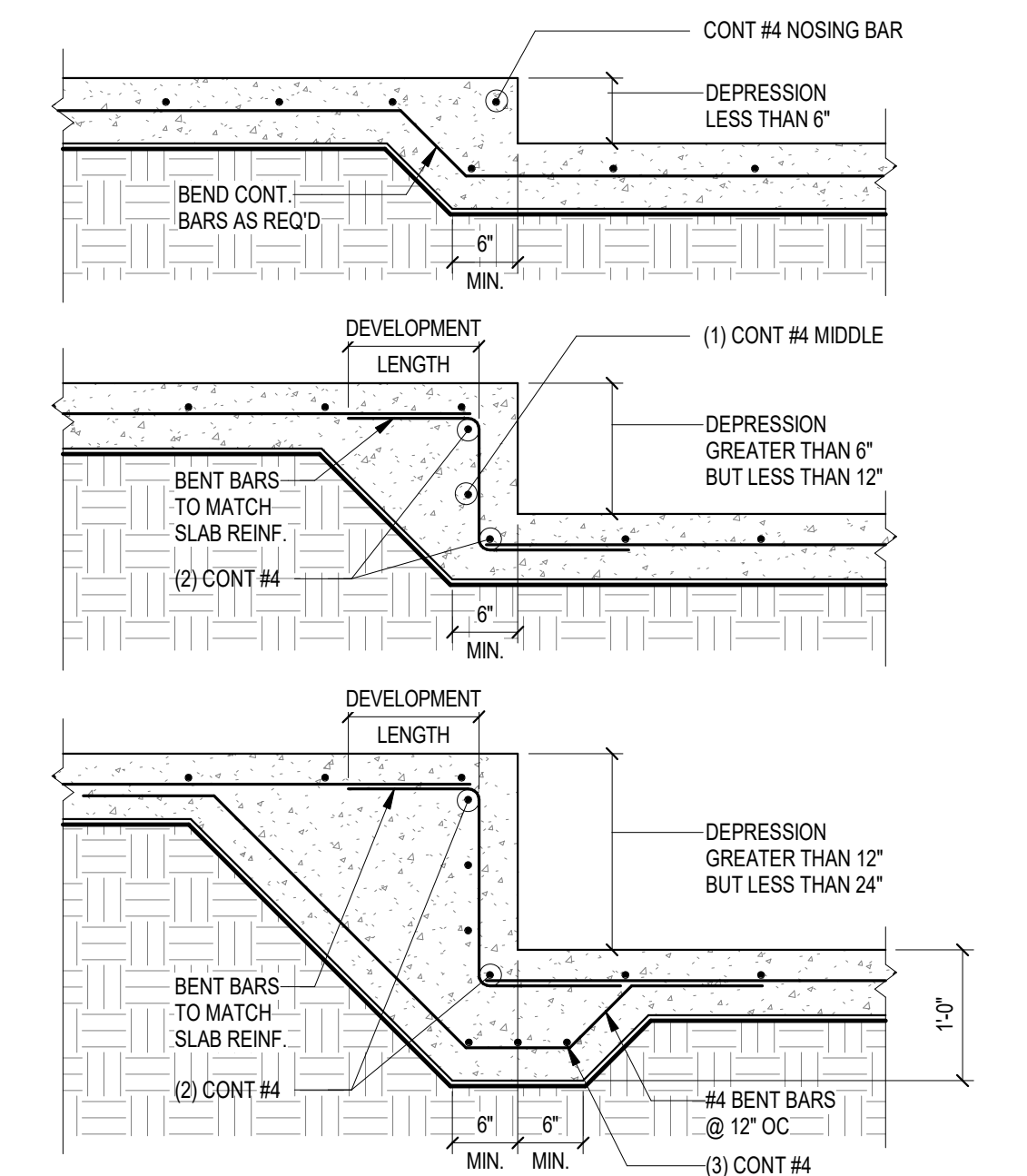
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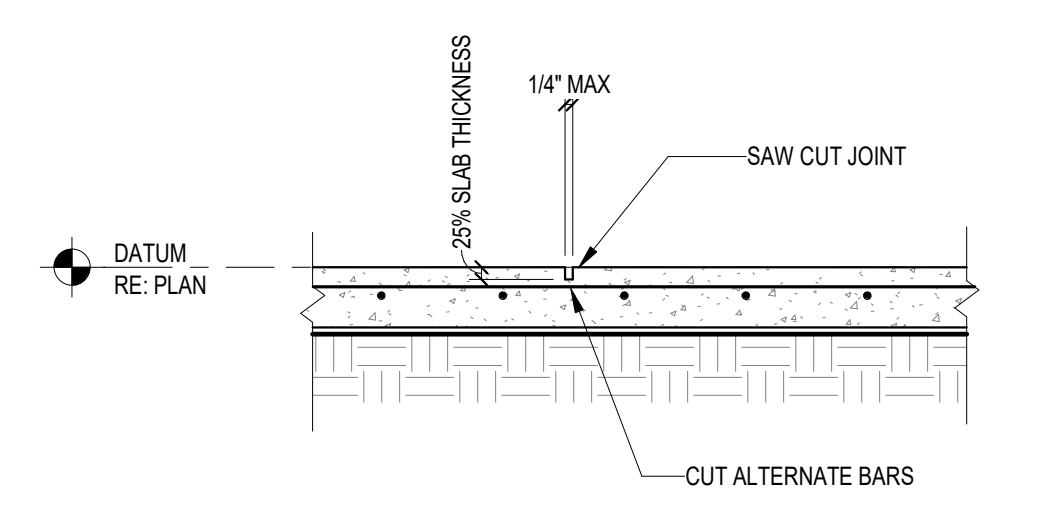
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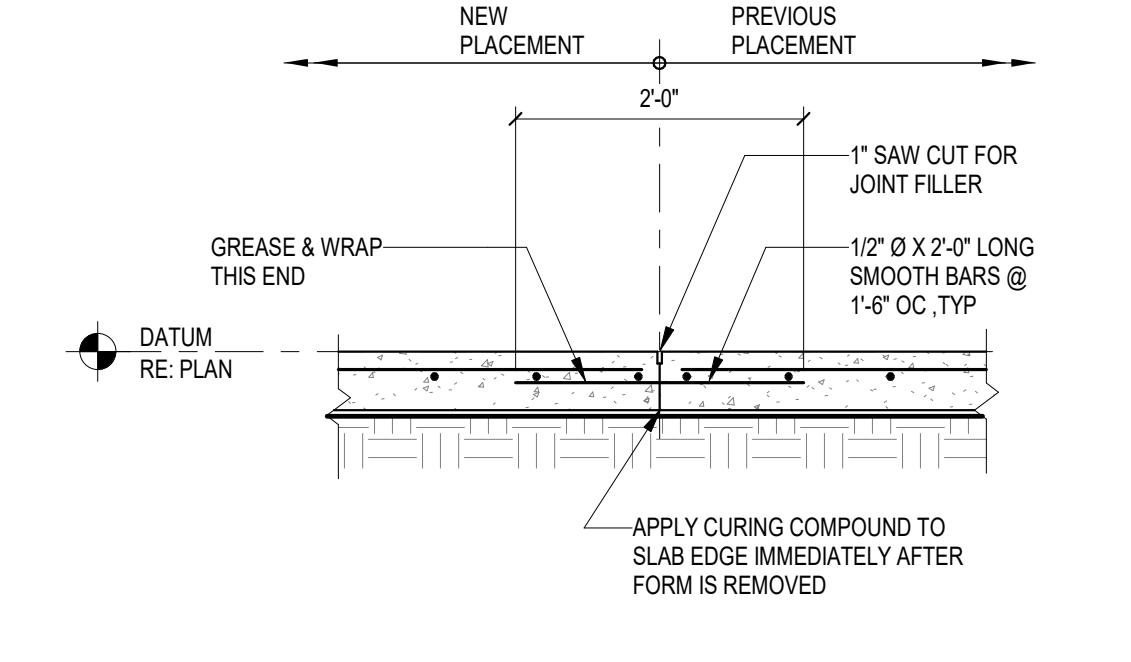
**5 TYPICAL RE-ENTRANT CORNER REINF.**  
3/4" = 1'-0"



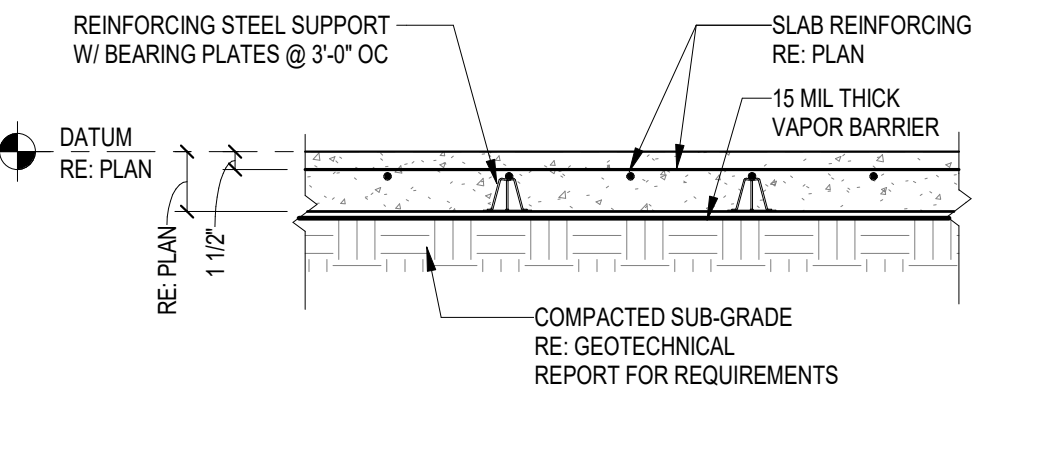
**4 TYPICAL SLAB DEPRESSION DETAILS**  
3/4" = 1'-0"



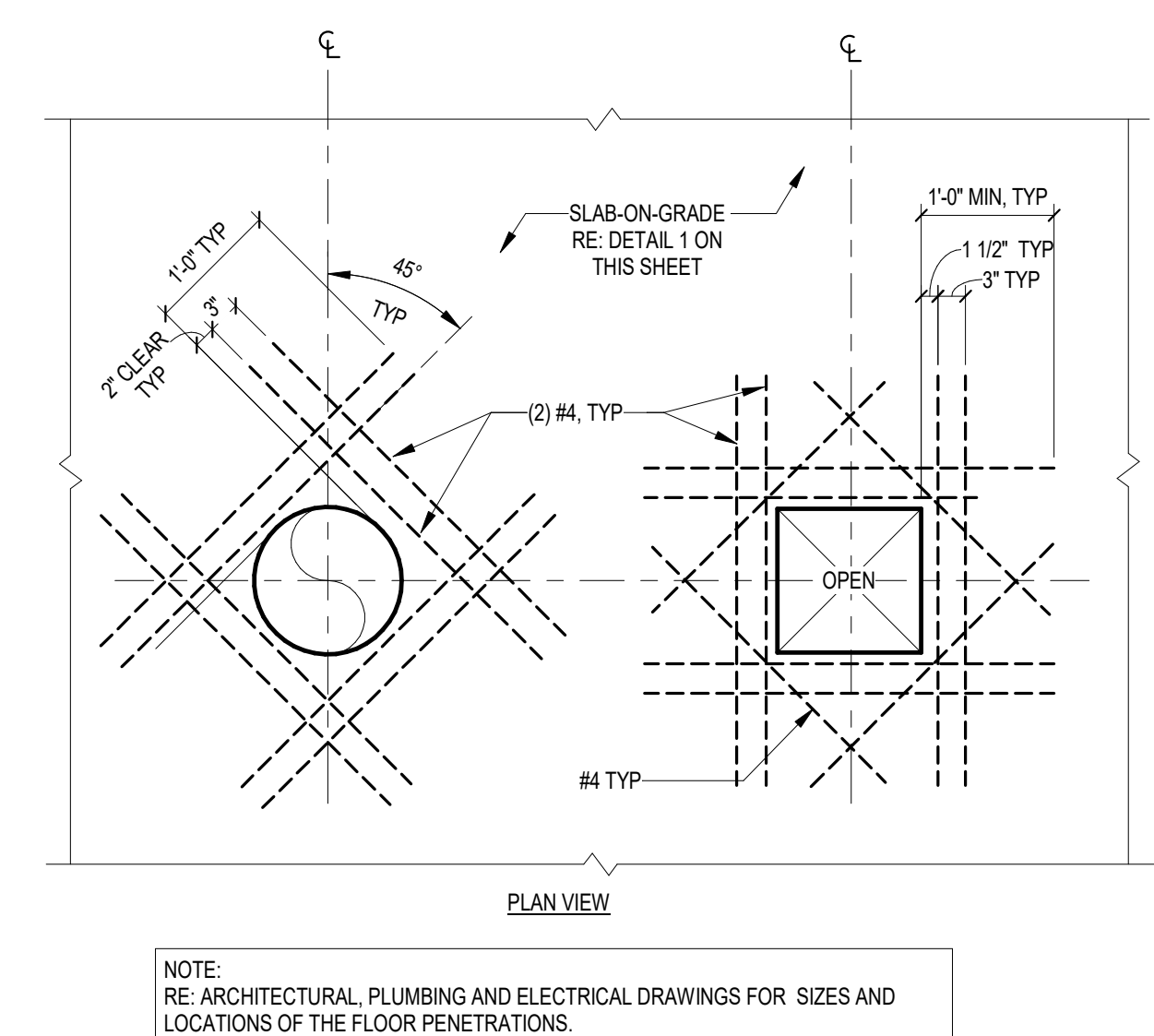
**3 TYPICAL SECTION - CONTROL JOINT**  
3/4" = 1'-0"



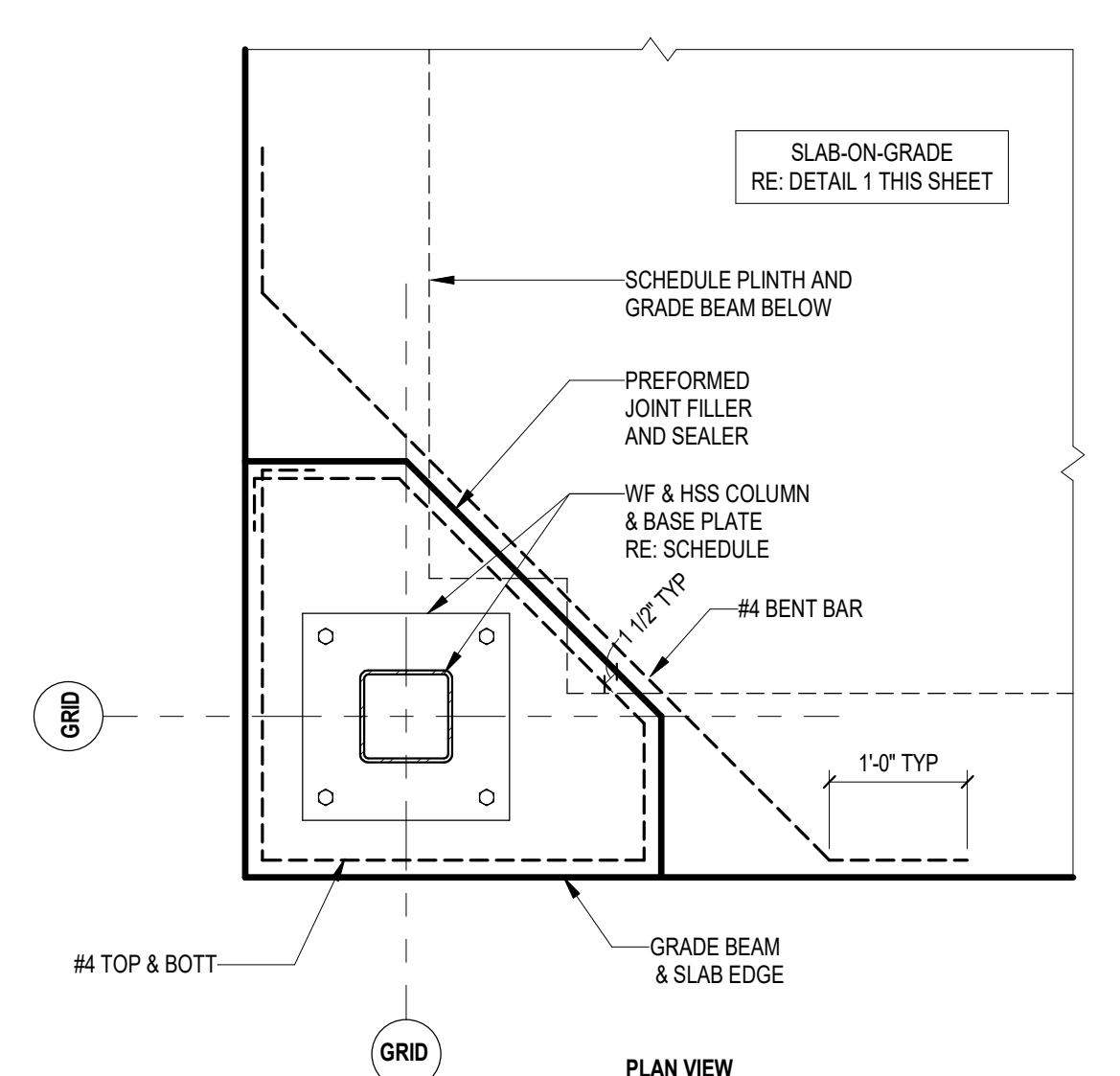
**2 TYPICAL SECTION - CONSTRUCTION JOINT**  
3/4" = 1'-0"



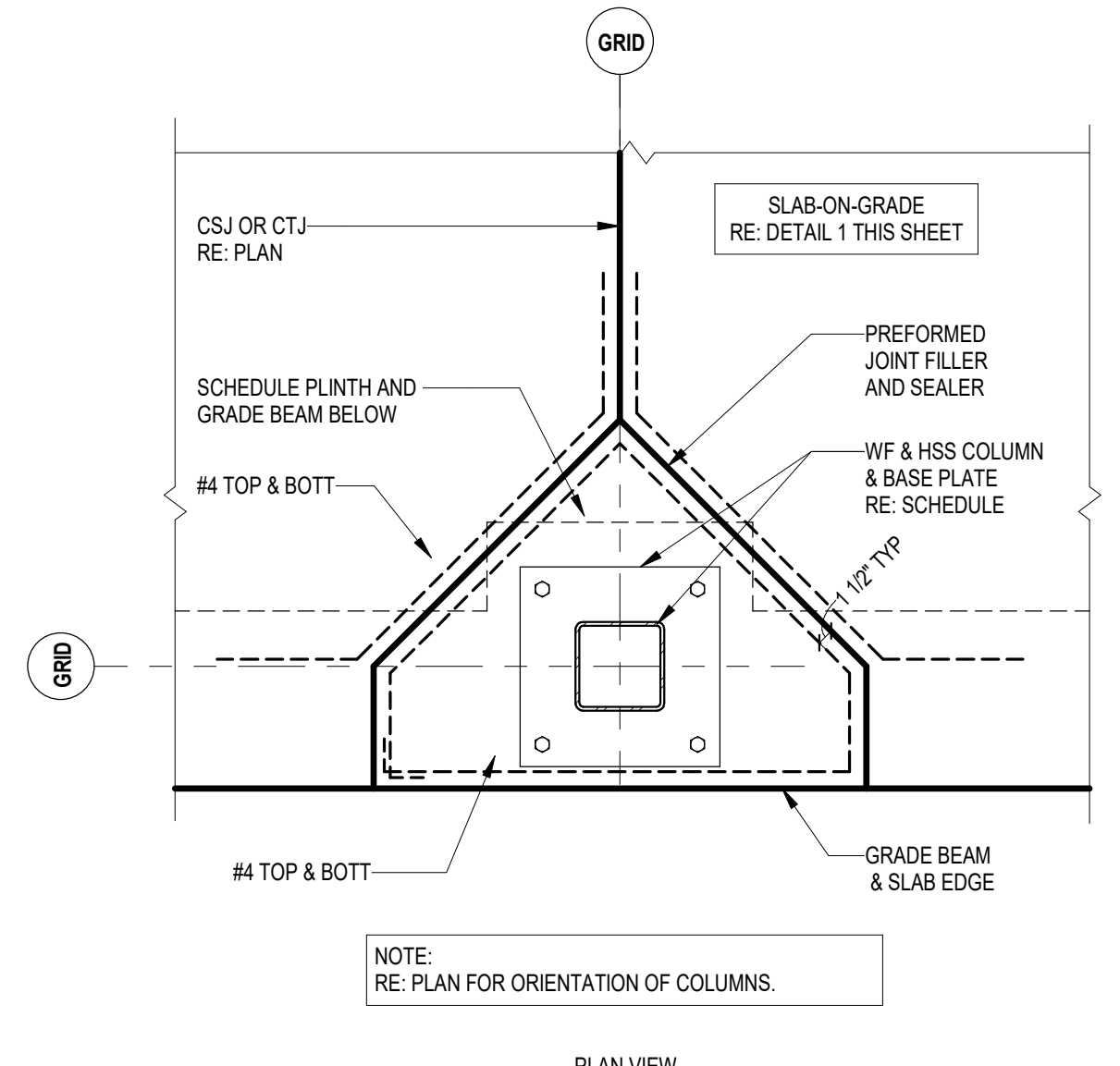
**1 TYPICAL SLAB SECTION**  
3/4" = 1'-0"



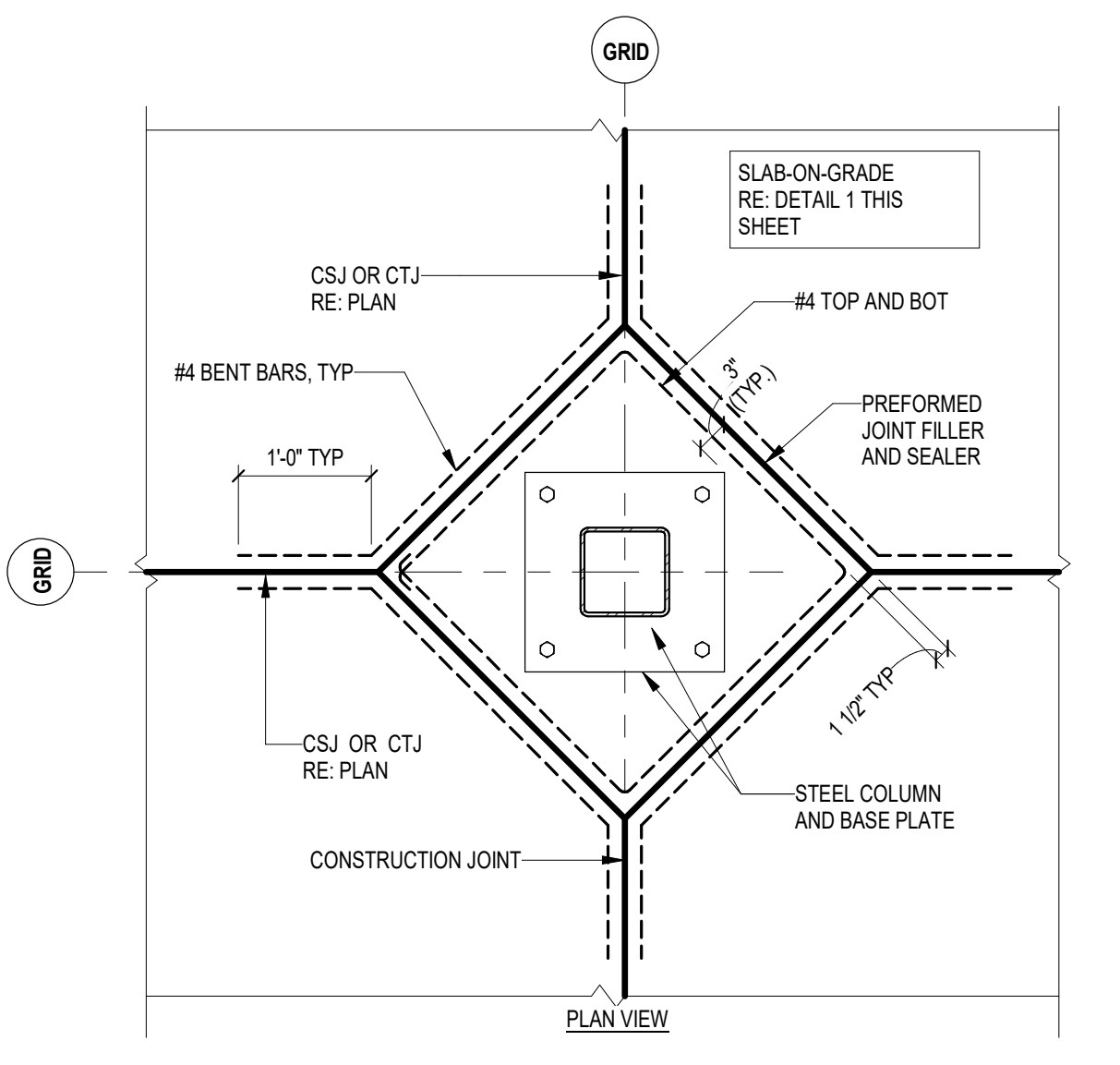
**9 SLAB REINF. AT OPENING 2'-0" OR LESS**  
3/4" = 1'-0"



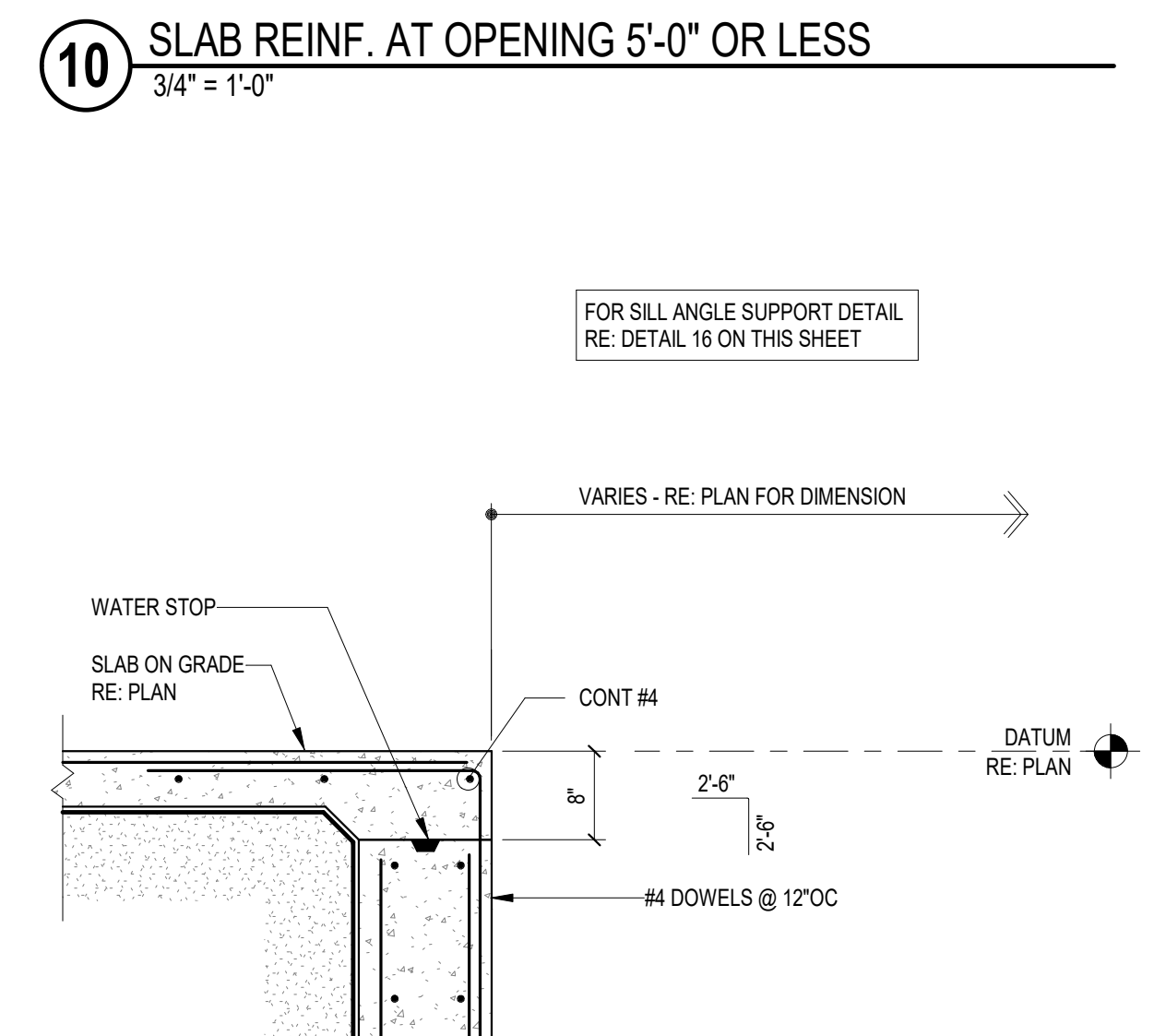
**8 EXTERIOR CORNER COLUMN BLOCKOUT**  
3/4" = 1'-0"



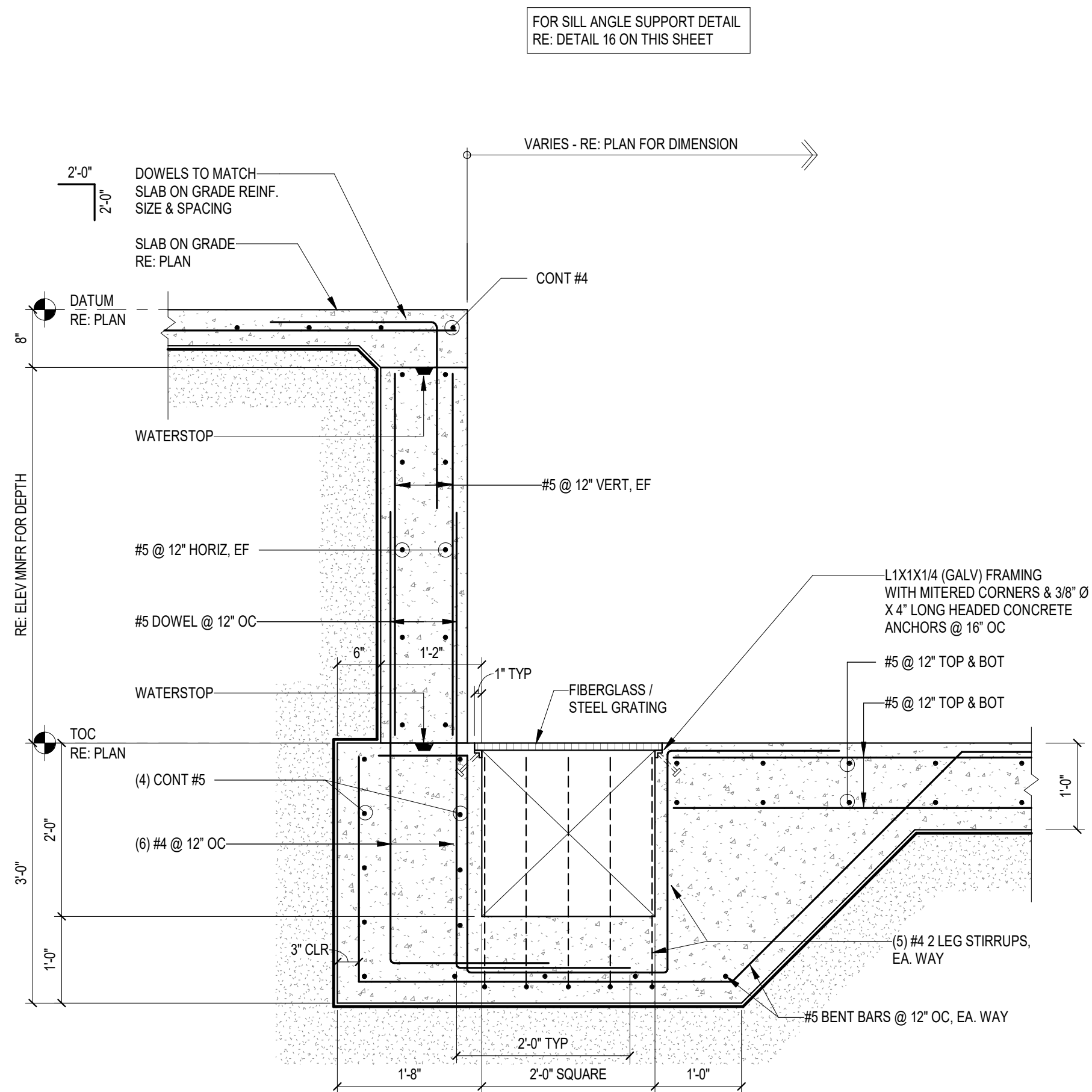
**7 PERIMETER COLUMN BLOCKOUT**  
3/4" = 1'-0"



**6 INTERIOR COLUMN BLOCKOUT**  
3/4" = 1'-0"



**10 SLAB REINF. AT OPENING 5'-0" OR LESS**  
3/4" = 1'-0"

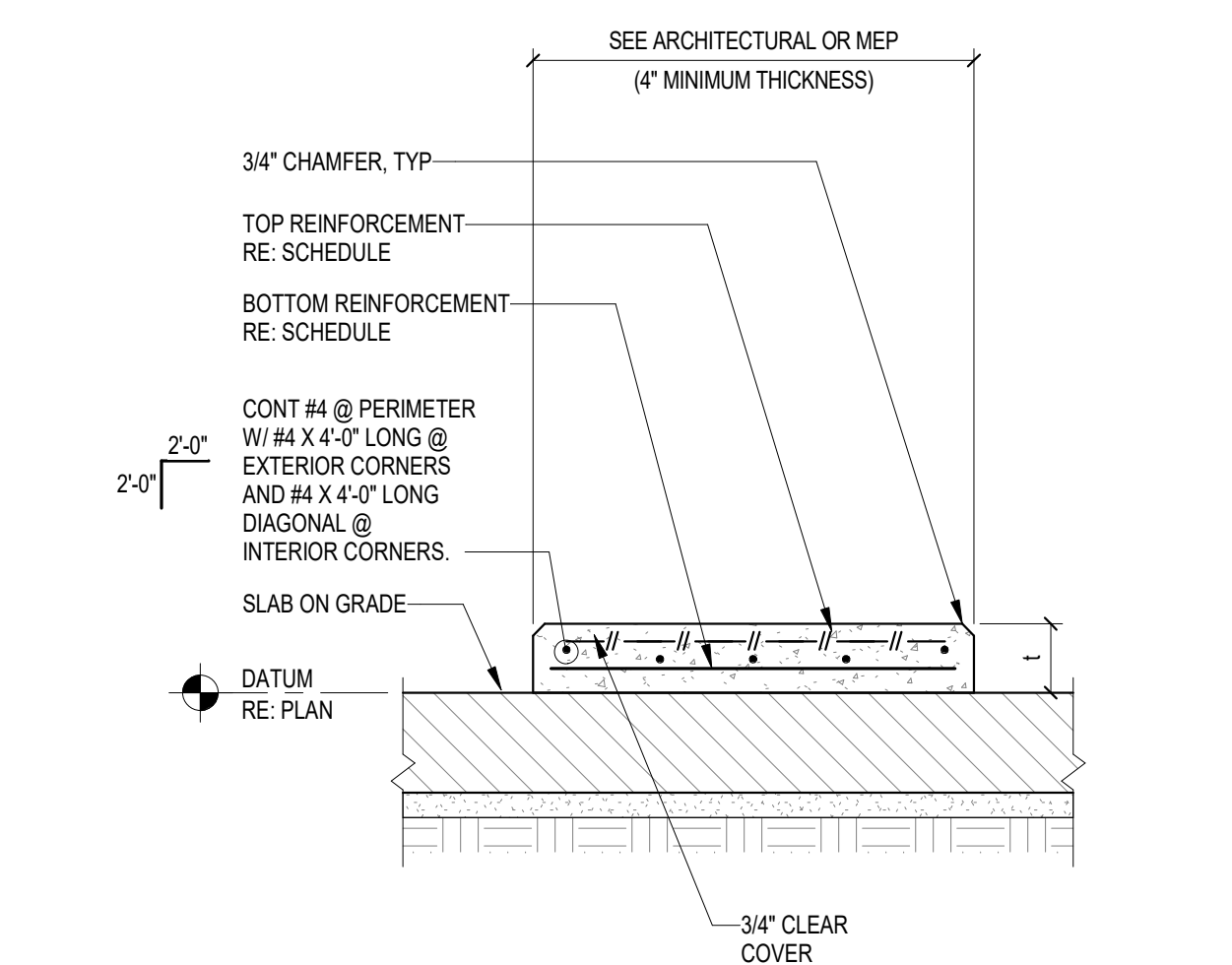


**13 SUMP PIT DETAIL**  
3/4" = 1'-0"

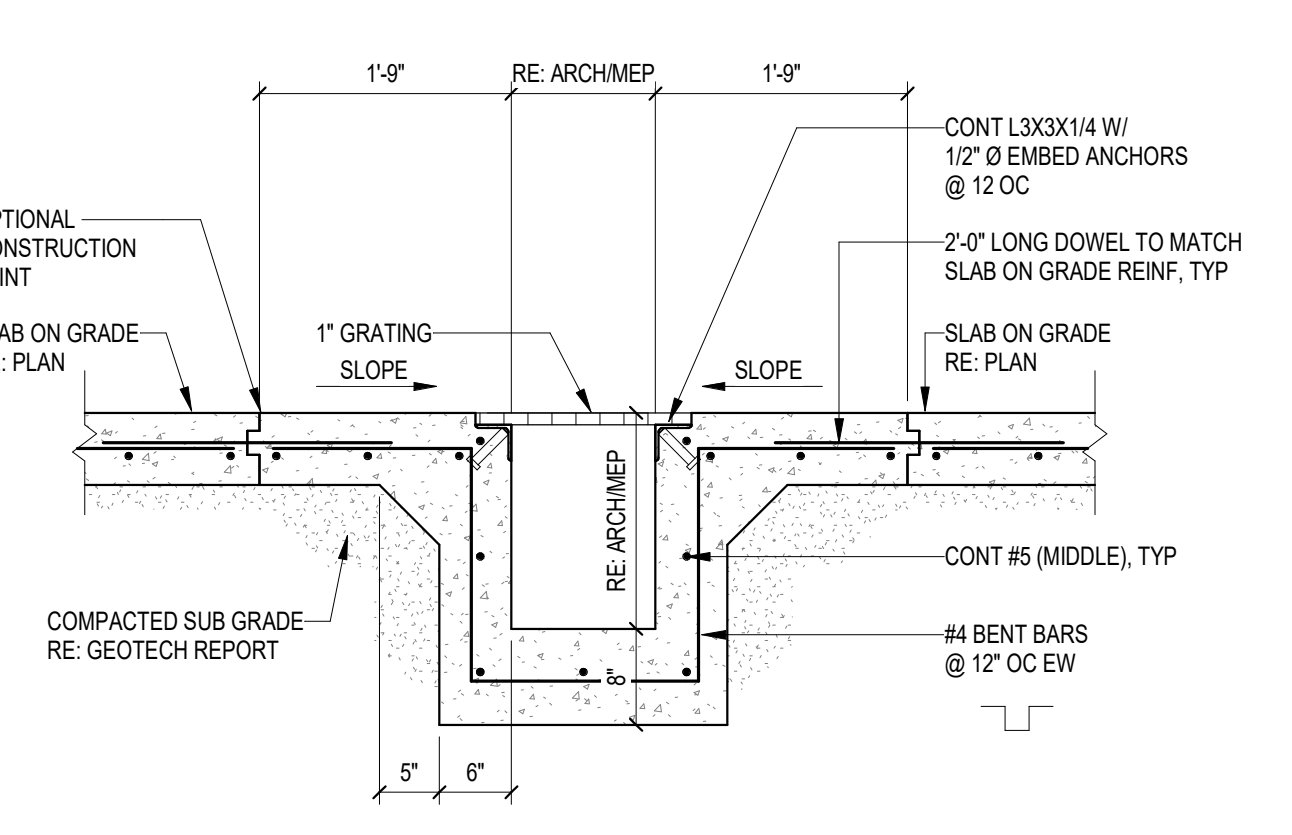
ROUGHEN SURFACE AND ADD BONDING AGENT TO EXIST SURFACE PRIOR TO HOUSEKEEPING PAD POUR

NOTE:  
GENERAL CONTRACTOR TO COORDINATE WITH MECHANICAL DRAWINGS AND SPECIFICATIONS TO DETERMINE REQUIREMENTS FOR HOUSEKEEPING PADS OVER SLAB ON GRADE AND PROVIDE WHERE REQUIRED WHETHER SHOWN ON STRUCTURAL DRAWINGS OR NOT. COORDINATE DIMENSIONS AND OTHER SPECIAL REQUIREMENTS WITH EQUIPMENT MANUFACTURERS AS REQUIRED.

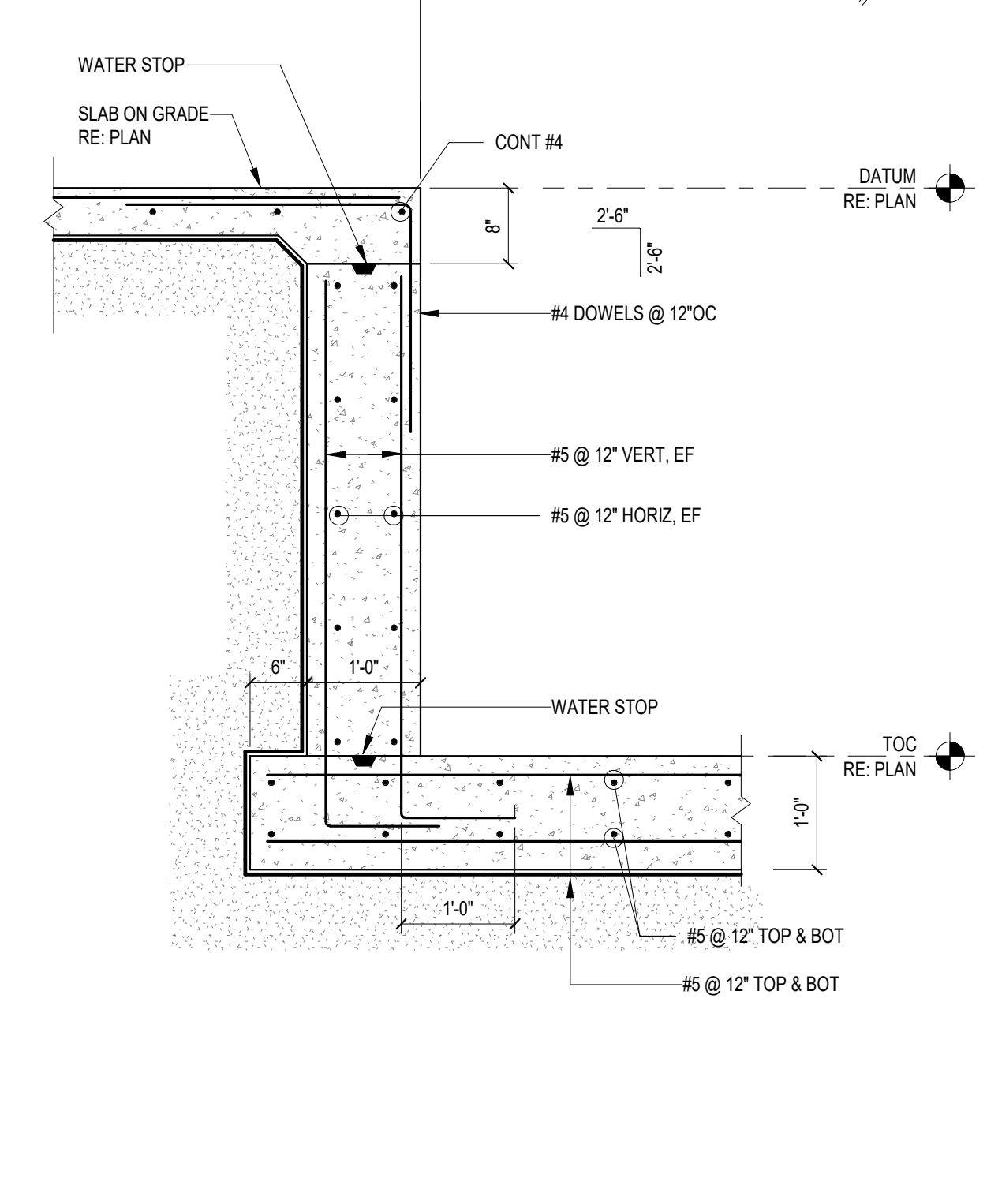
PAD THICKNESS	TOP REINFORCEMENT	BOTTOM REINFORCEMENT
1'-0" <= 4'-0"	6" x 6" W2.9 x W2.9	NONE
4'-0" <= 6'-0"	4" x 4" W4.0 x W4.0	NONE
6'-0" <= 8'-0"	4" x 4" W5.5 x W5.5	NONE
8'-0" <= 12'-0"	#4 @ 12" EW	#3 @ 18" EW
12'-0" <= 16'-0"	#4 @ 12" EW	#4 @ 12" EW



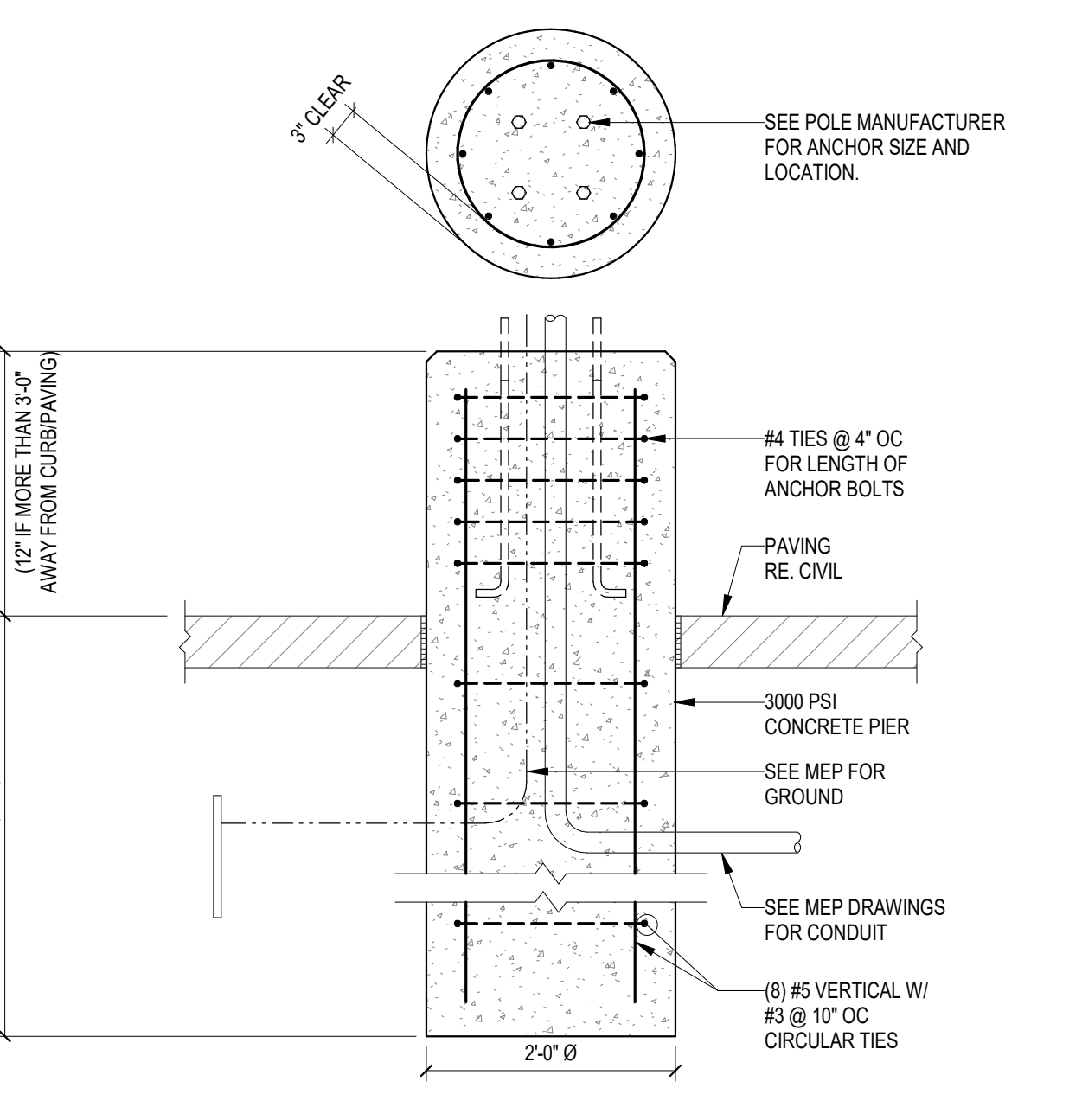
**12 HOUSEKEEPING PAD**  
3/4" = 1'-0"



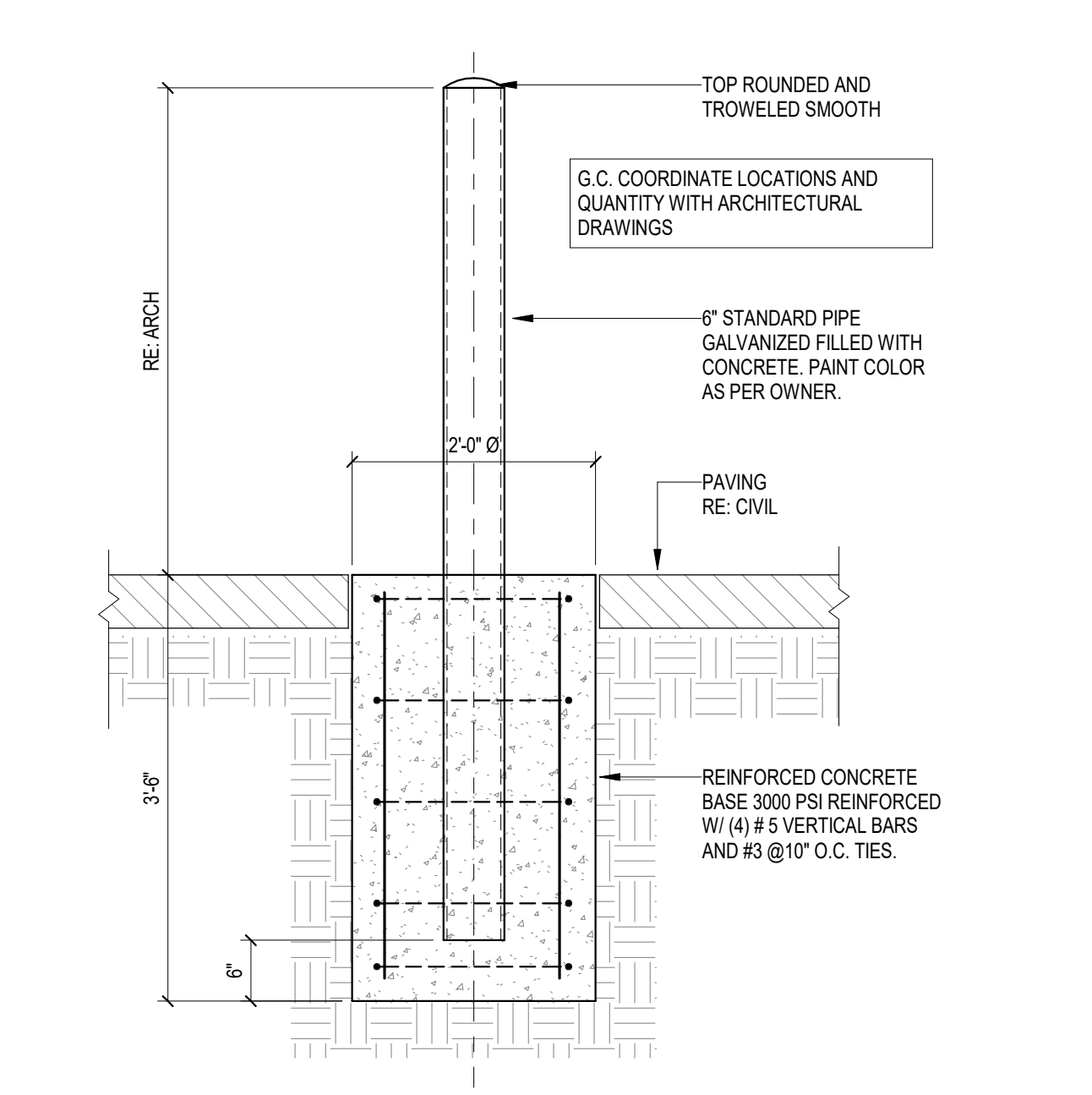
**11 TYPICAL TRENCH DRAIN DETAIL**  
3/4" = 1'-0"



**14 ELEVATOR PIT WALL DETAIL**  
3/4" = 1'-0"

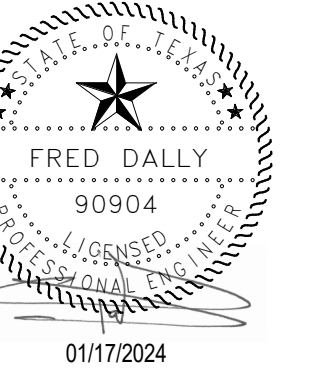


**16 TYPICAL LIGHT POLE DETAIL (30'-0" TALL MAX)**  
3/4" = 1'-0"



**15 TYPICAL BOLLARD DETAIL**  
3/4" = 1'-0"

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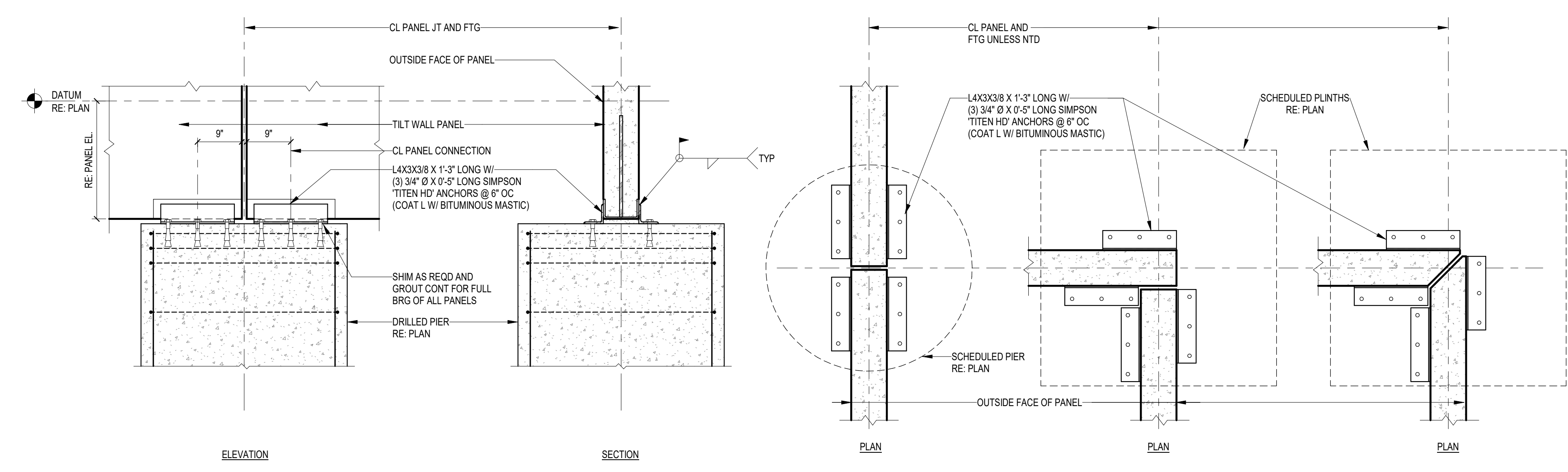
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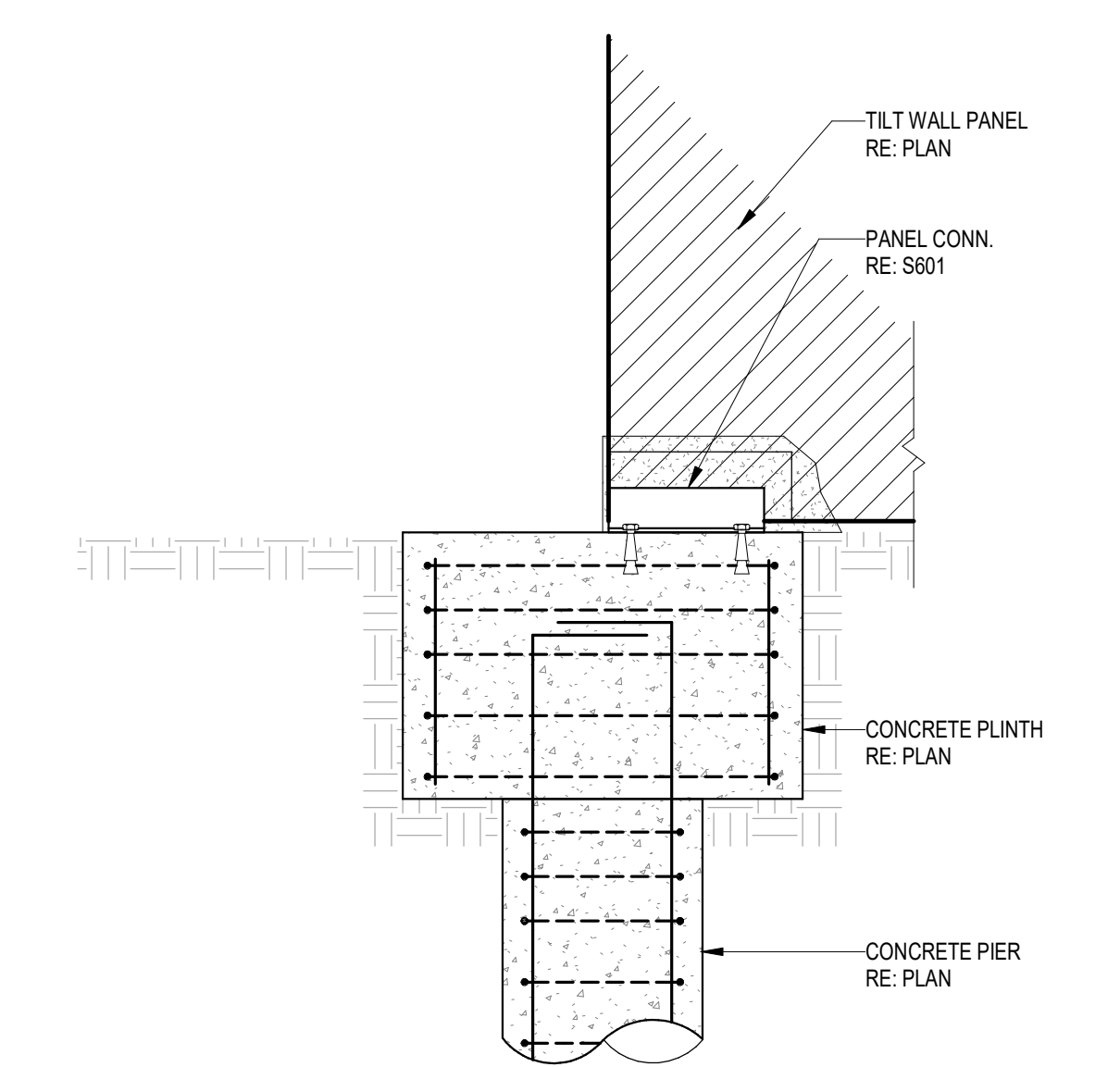
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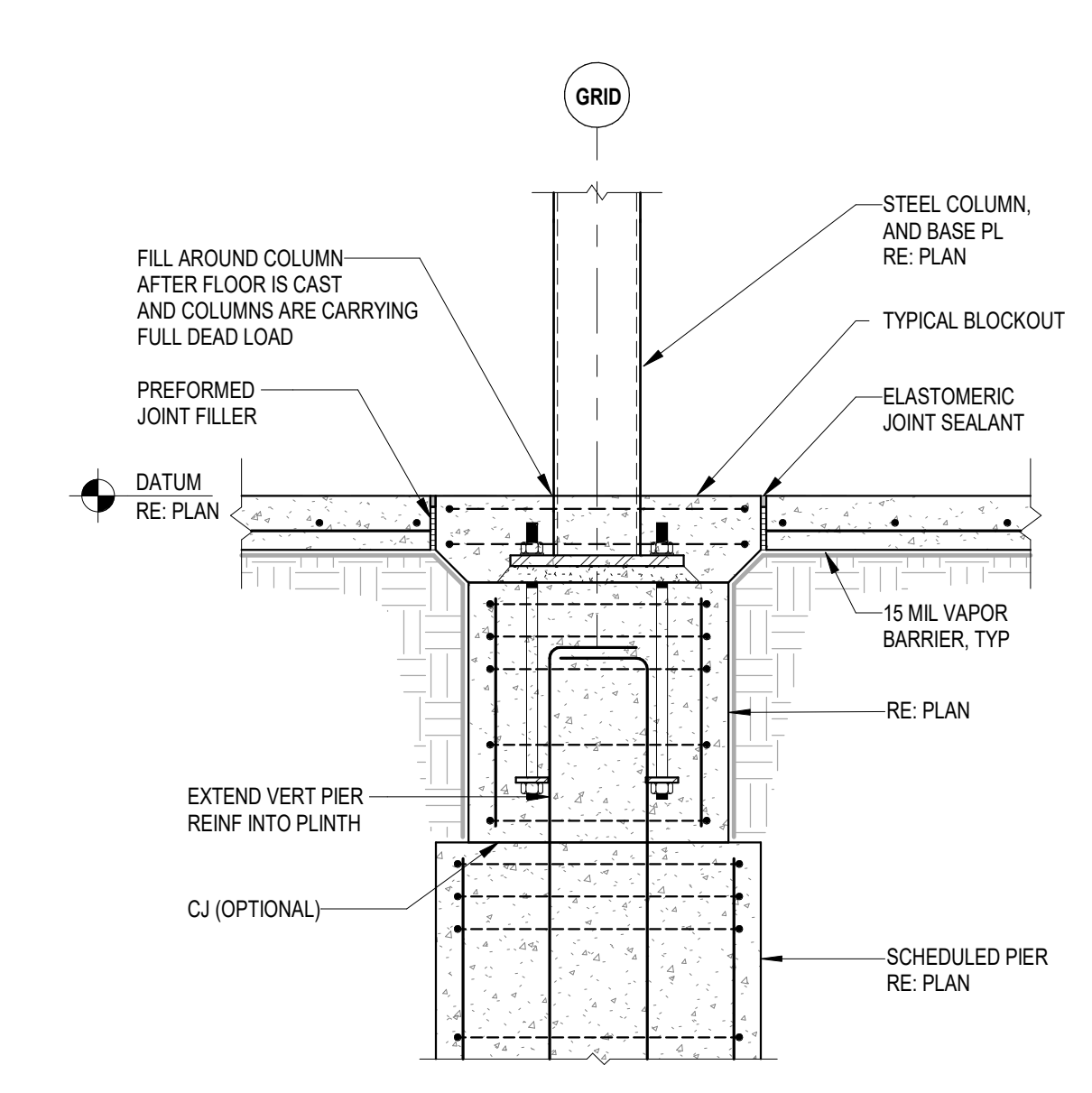
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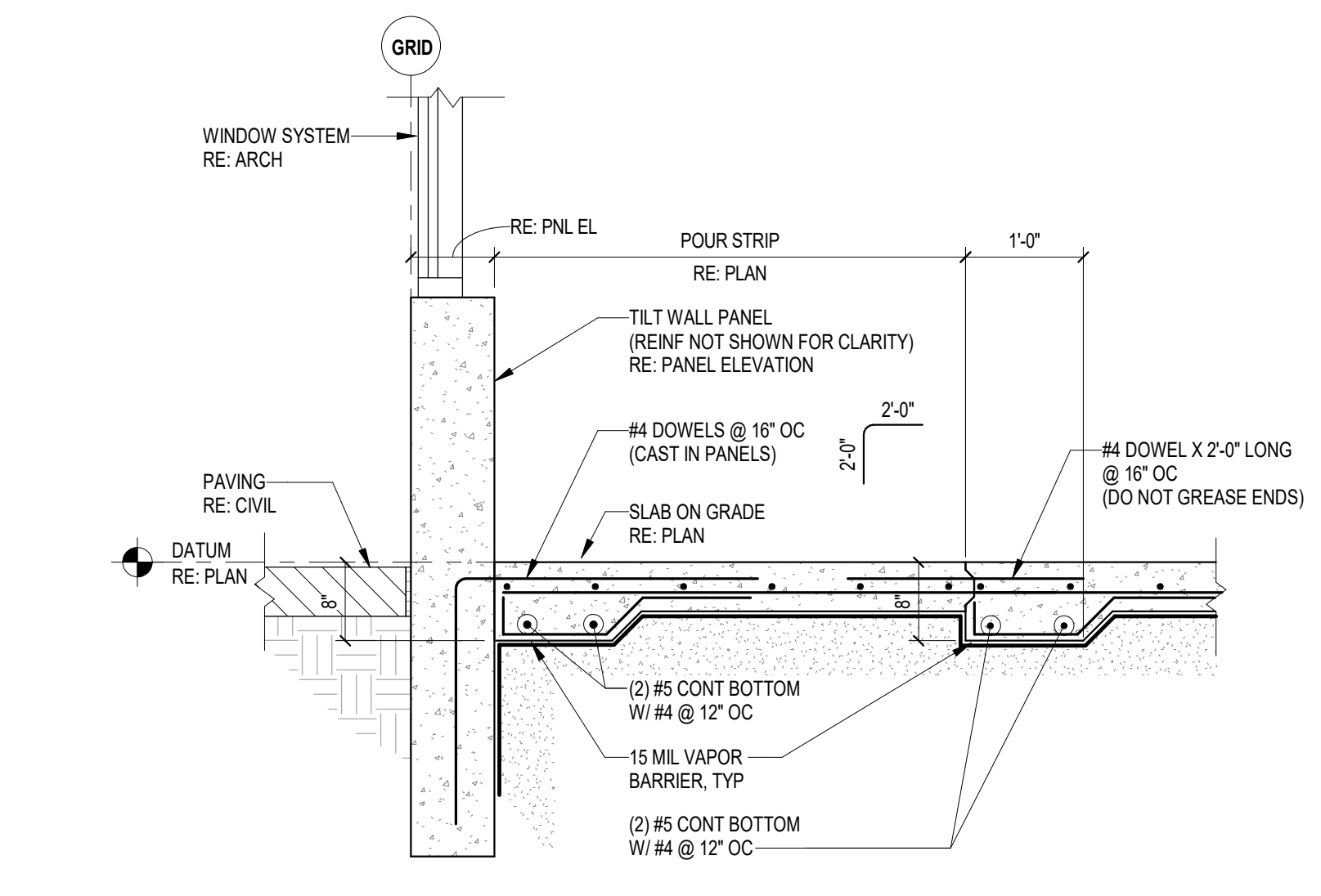
**1** PANEL SUPPORT AT PIER  
3/4" = 1'-0"



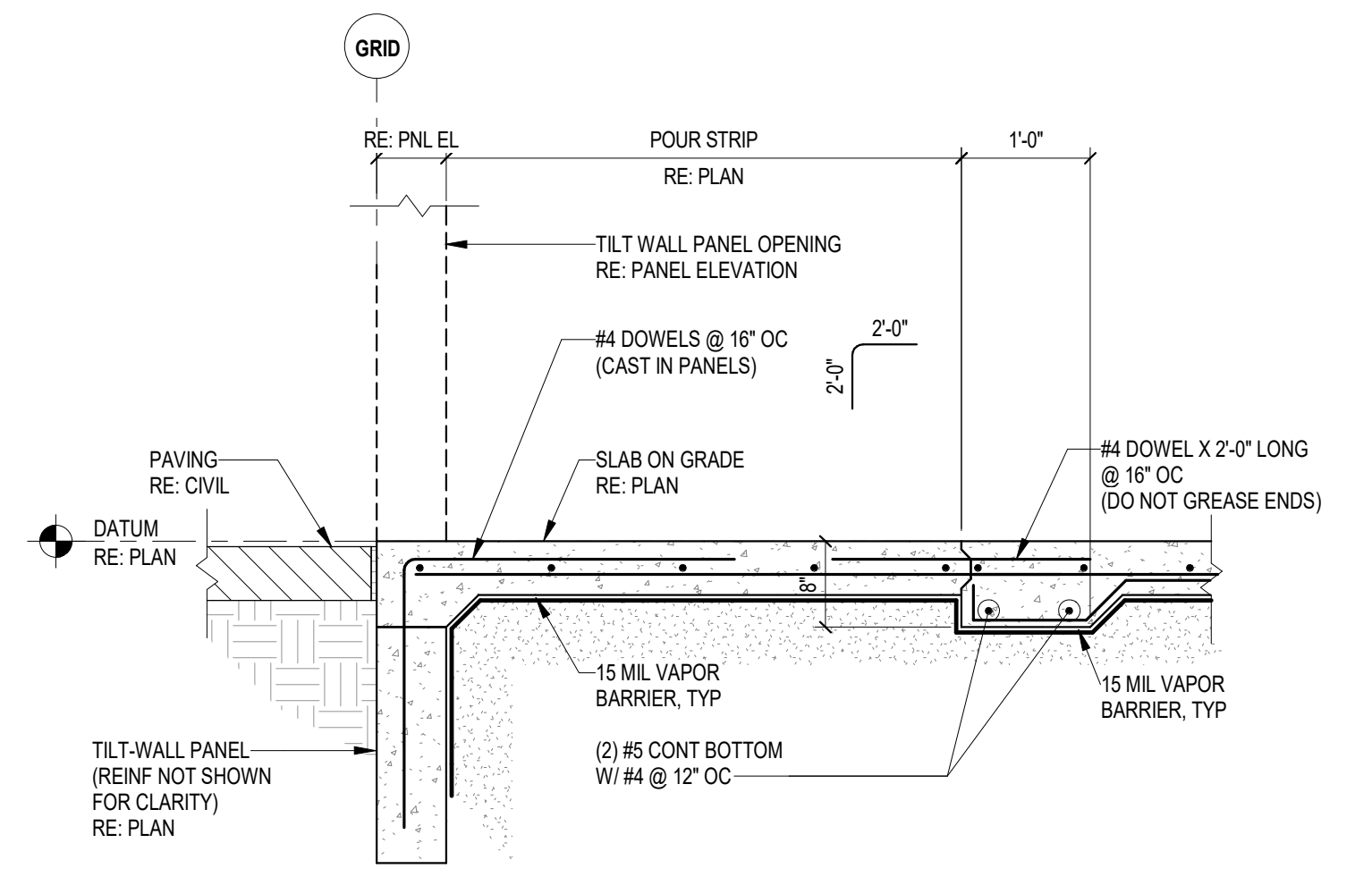
**2** GRADE BEAM AND PANEL CONN. AT PLINTH  
3/4" = 1'-0"



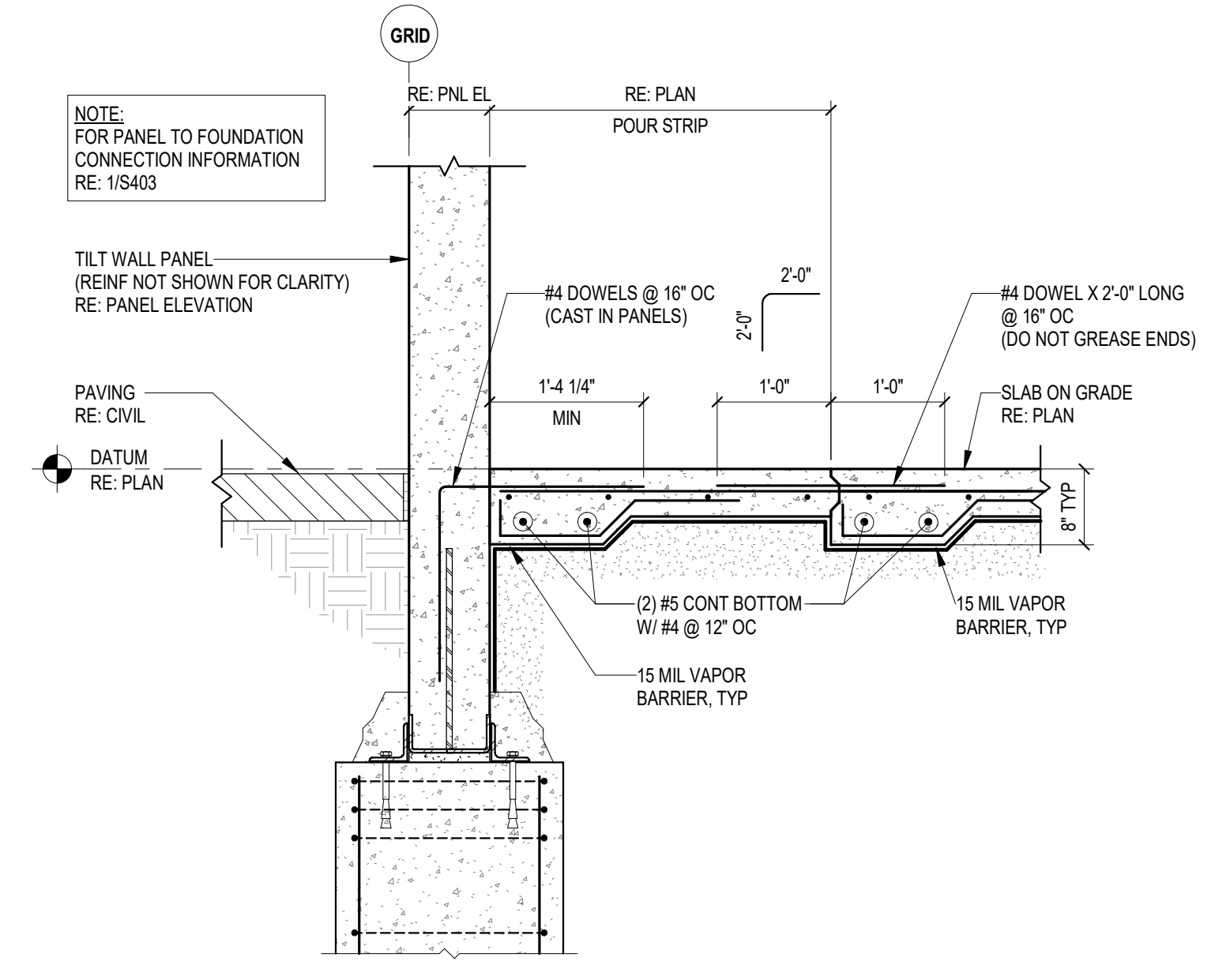
**3** TYPICAL INTERIOR COLUMN SECTION  
3/4" = 1'-0"



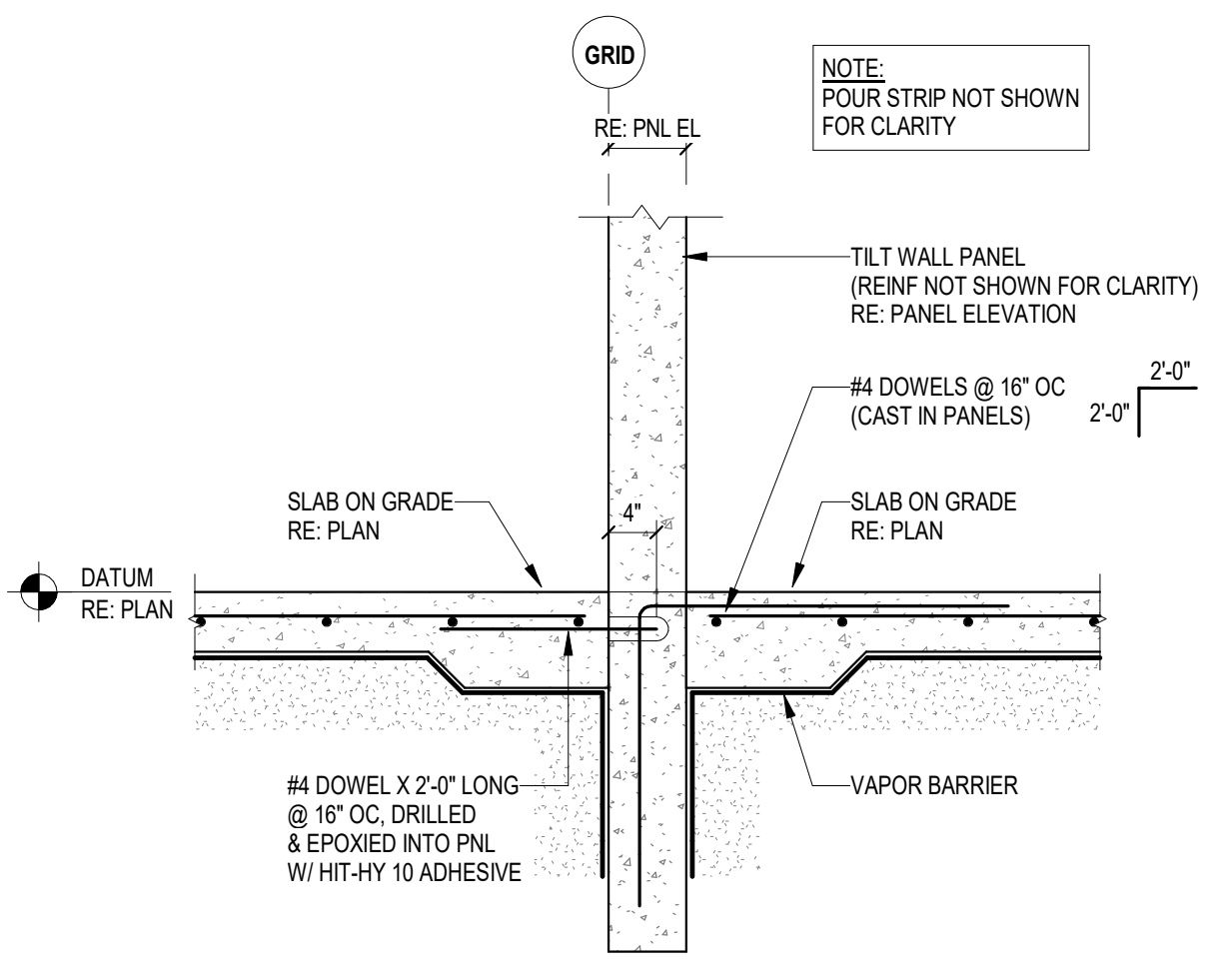
**4** EXTERIOR PANEL  
3/4" = 1'-0"



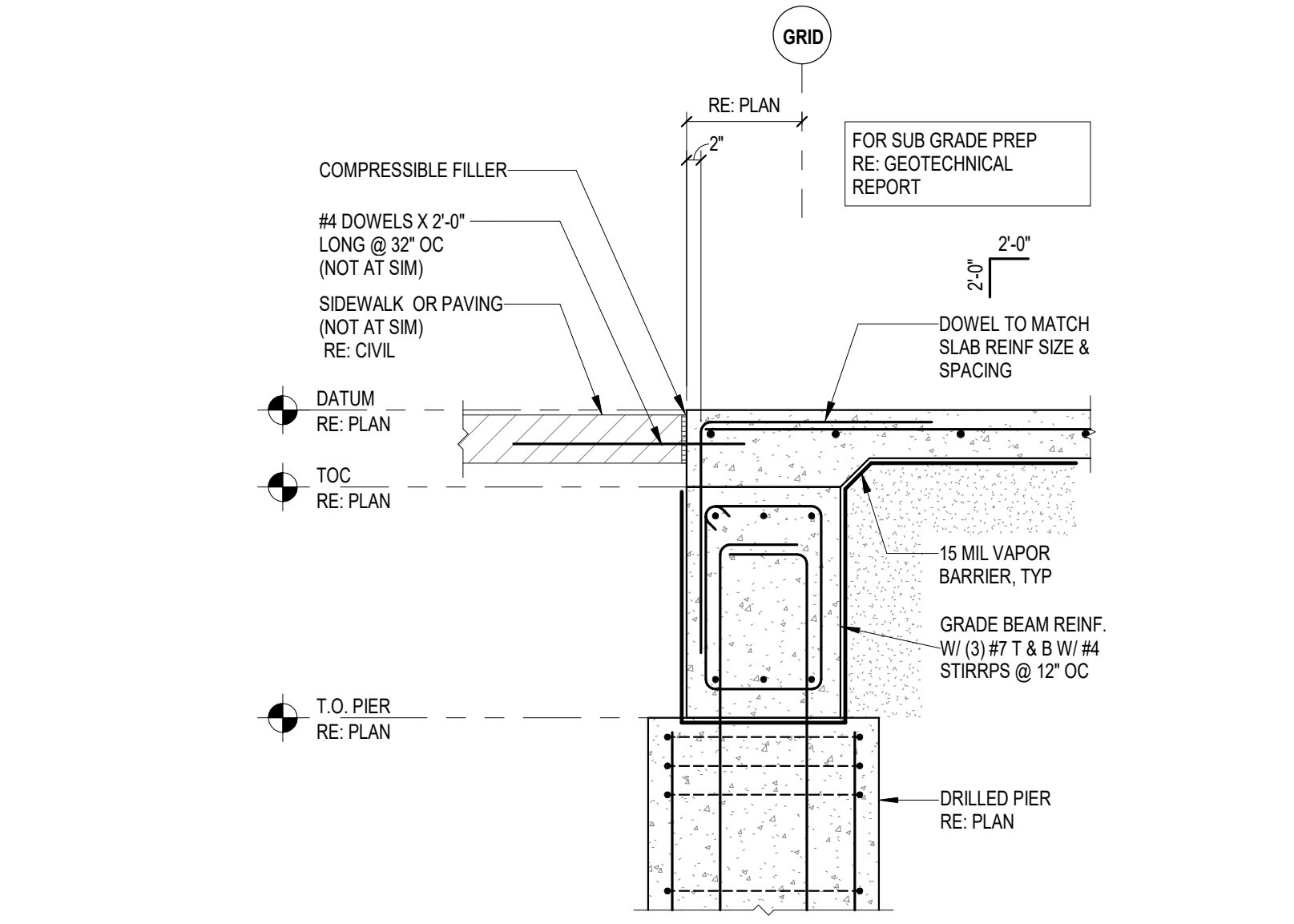
**5** EXTERIOR PANEL OPENING  
3/4" = 1'-0"



**6** SLAB EDGE AT TILT UP PANEL  
3/4" = 1'-0"



**7** INTERIOR PANEL  
3/4" = 1'-0"



**8** SECTION AT MAN DOOR  
3/4" = 1'-0"

Project No.: 2330

Drawing Date: 01/17/2024  
Drawn: MR  
Checked: SJ  
Scale: AS NOTED

Issue Log:

No.	Description	Date
1	100%CD	01.17.2024

Revisions:

No.	Description	Date
1	Revision 1	Date 1

FOUNDATION  
DETAILS

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**S402**



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FBC Elections Administration Building

5700 BAYMORE RD.  
ROSENBERG, TX 77471  
100% CONSTRUCTION DOCUMENTS

Project No.: 2330  
Drawing Date: 01/17/2024  
Drawn: MR  
Checked: SJ  
Scale: AS NOTED

Issue Log:

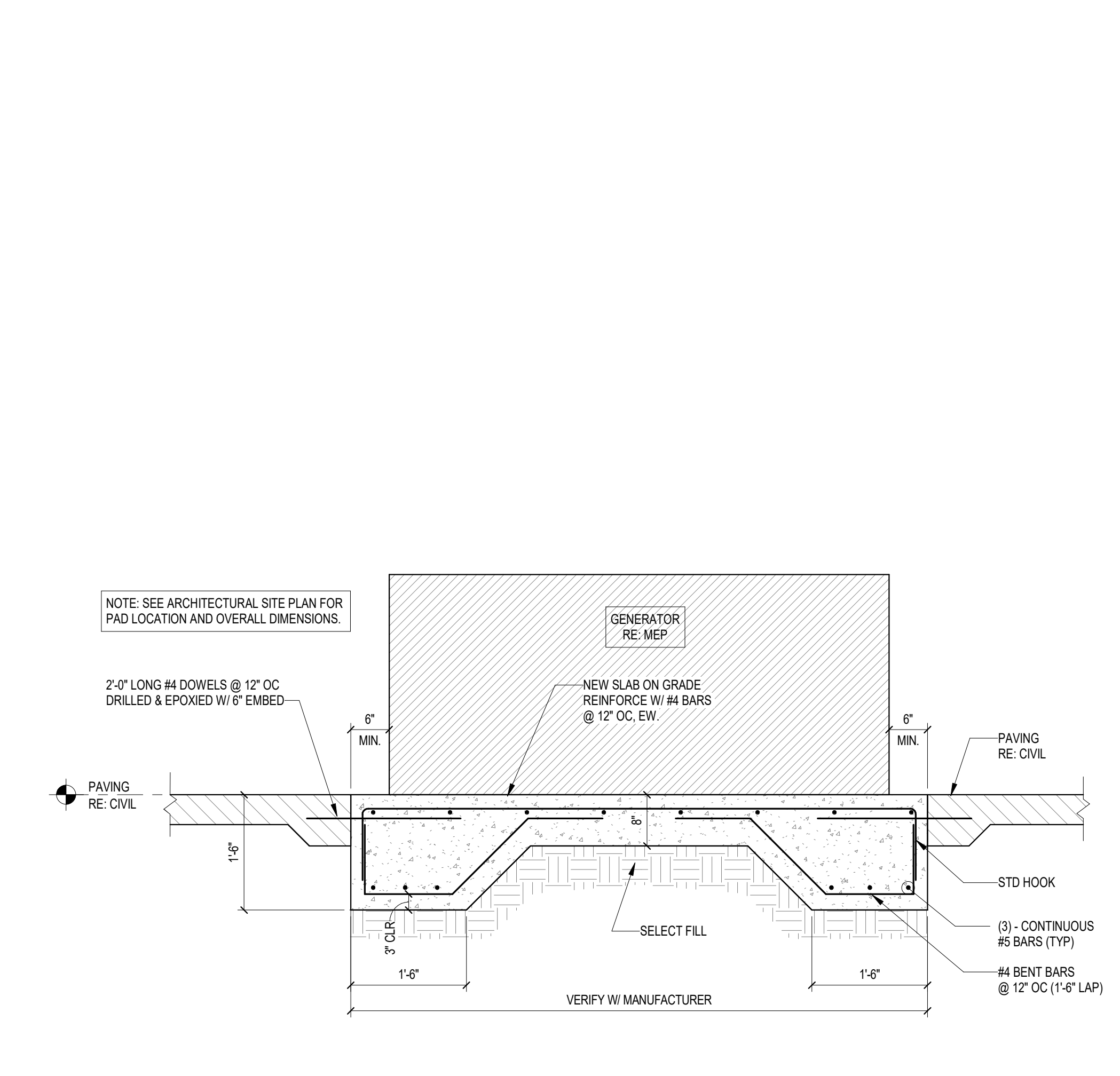
No.	Description	Date
1	100%CD	01.17.2024

Revisions:

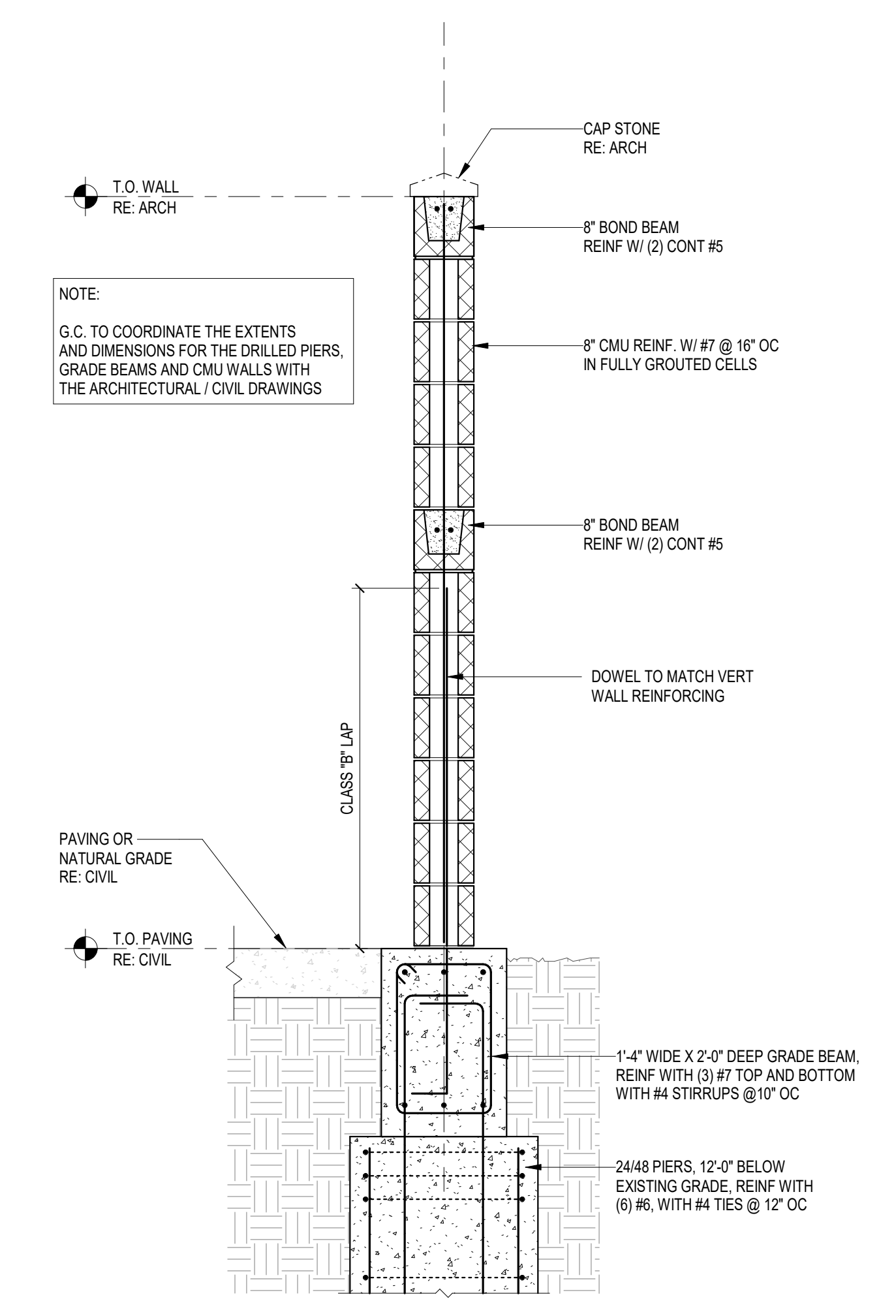
No.	Description	Date
1	Revision 1	Date 1

FOUNDATION SITE  
DETAILS

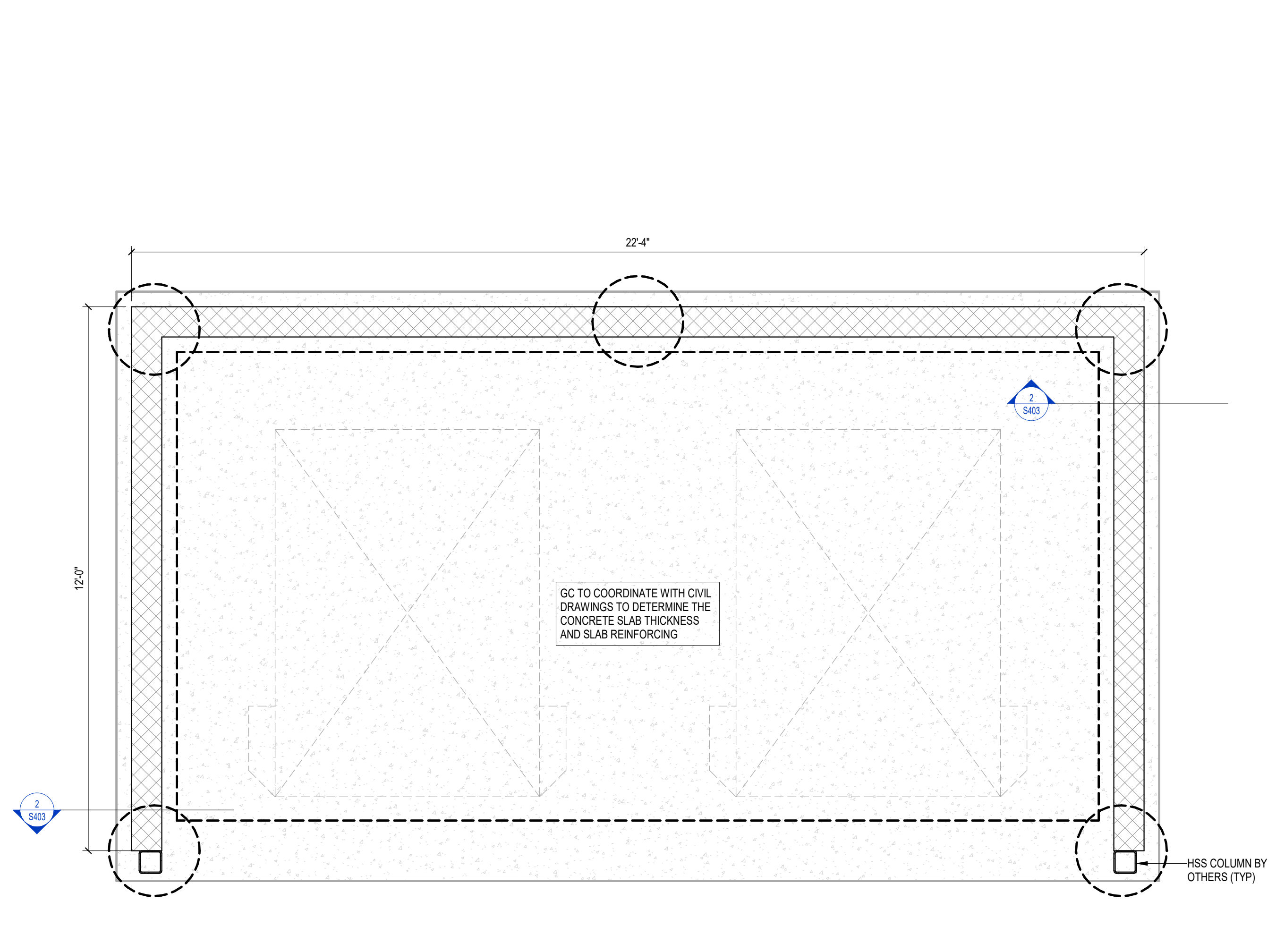
**S403**



**3** FOUNDATION AT GENERATOR  
3/4" = 1'-0"

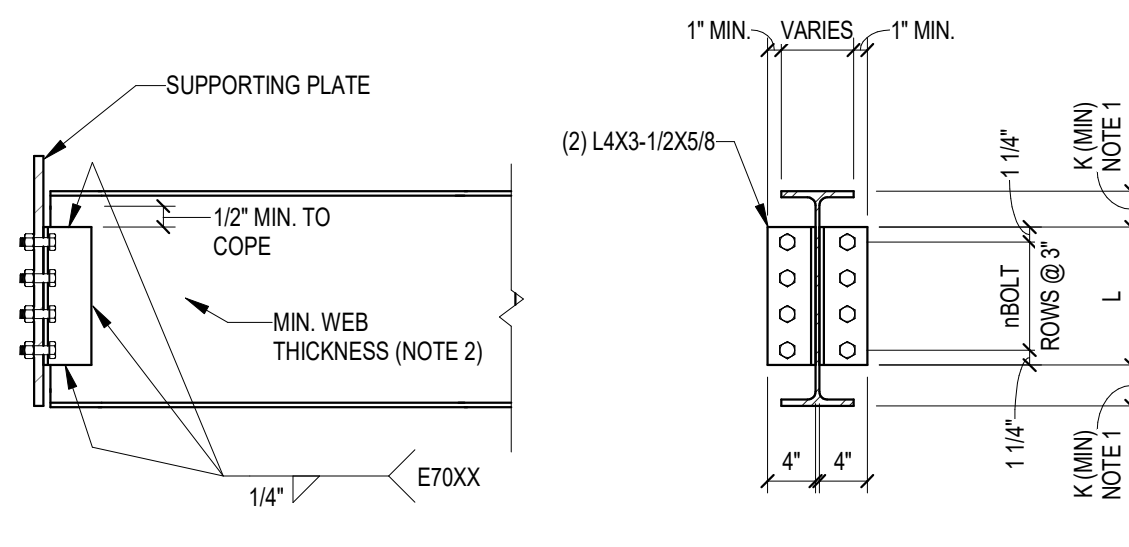


**2** DUMPSTER ENCLOSURE AND GENERATOR FOUNDATION  
3/4" = 1'-0"



**1** DUMPSTER ENCLOSURE  
1/2" = 1'-0"



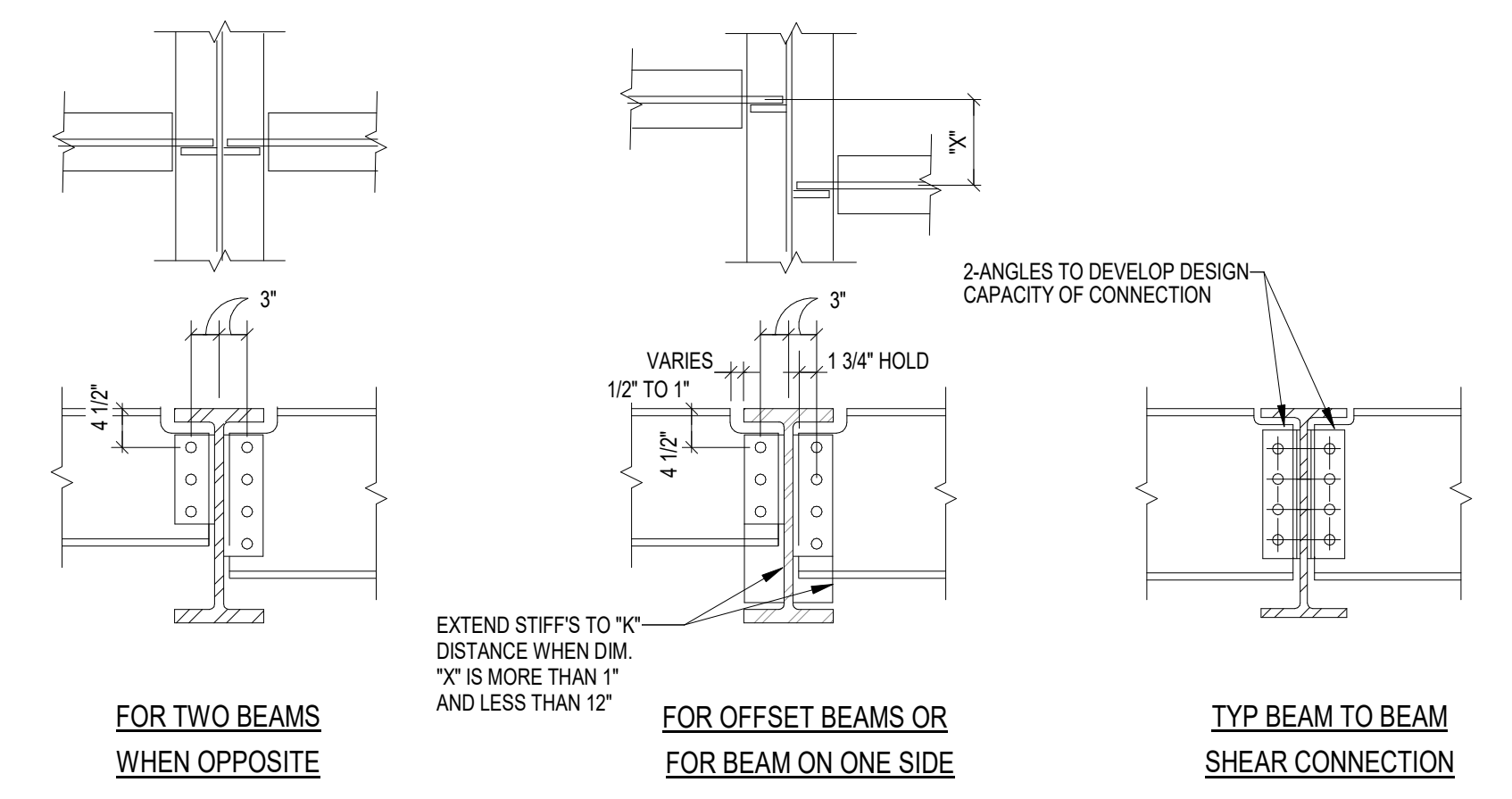


N <sup>o</sup>	(INCHES)	ALLOWABLE BOLT CAPACITY (KIPS)	ALLOWABLE WELD CAPACITY (KIPS)
2	5 1/2"	37	48
3	8 1/2"	56	77
4	11 1/2"	74	100
5	14 1/2"	93	122
6	17 1/2"	111	143
7	20 1/2"	130	160
8	23 1/2"	148	180
9	26 1/2"	167	198
10	29 1/2"	186	215

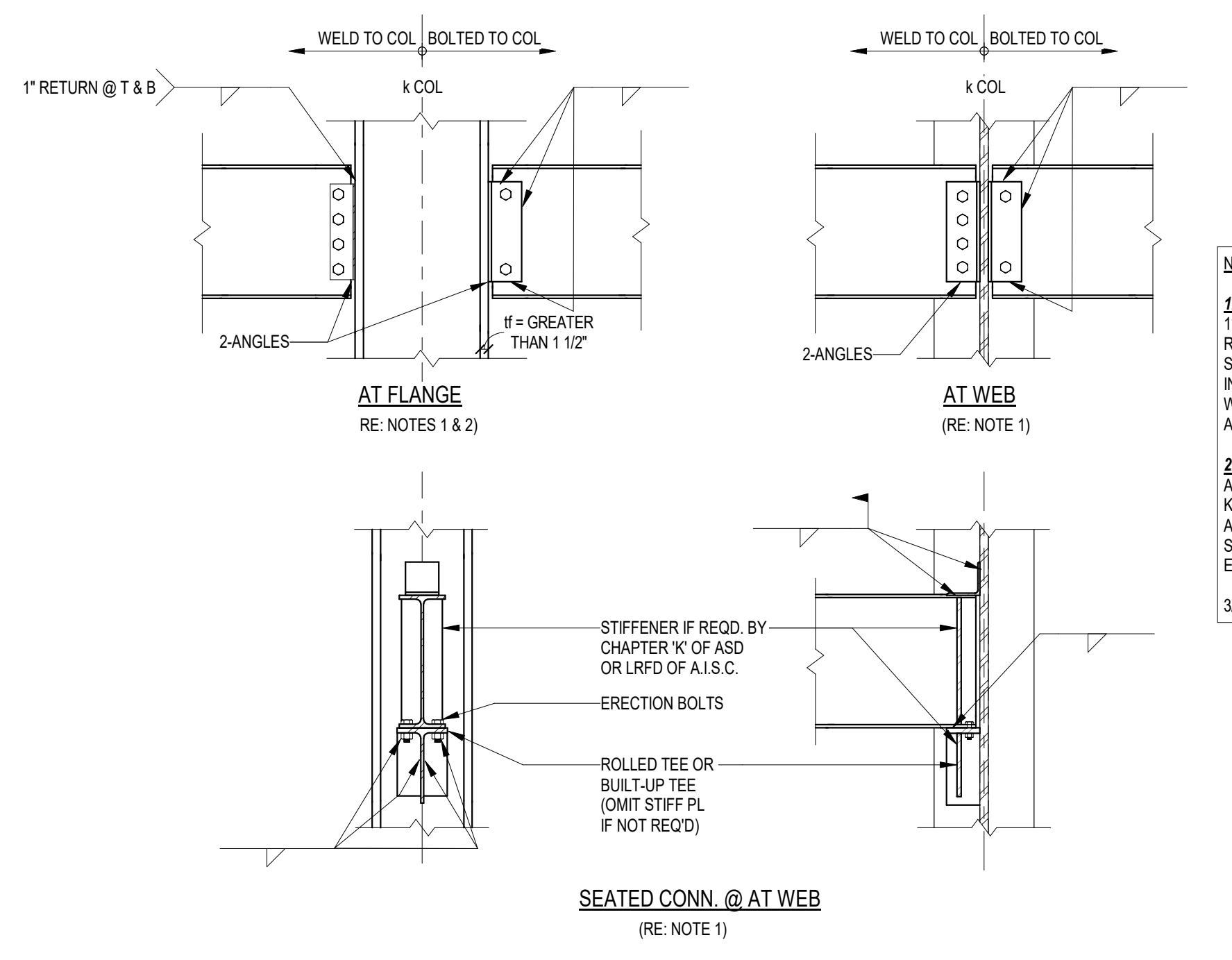
- NOTES:**
- REFER TO AISC - MANUAL OF STEEL CONSTRUCTION (SECTION 1).
  - ALLOWABLE WELD CAPACITY IS BASED UPON A BEAM WEB THICKNESS OF 1/2" FOR A36 MATERIAL AND 3/8" FOR ASTM A572, GRADE 50 MATERIAL. REDUCE THIS CAPACITY PROPORTIONALLY FOR A LESSER WEB THICKNESS.
  - THE SUPPORTING PLATE CAPACITY SHALL BE BASED UPON AN ALLOWABLE LOAD PER BOLT OF 65 KIPS PER INCH OF PLATE THICKNESS FOR A36 MATERIAL OR 73 KIPS PER INCH OF PLATE THICKNESS FOR ASTM A572 GRADE 50 MATERIAL. FOR BEAM CONNECTIONS ON TWO SIDES, THE SUM OF THE LOADS PER BOLT SHALL BE CONSIDERED.
  - FOR COPED BEAM CONNECTIONS, THE CAPACITY OF THE NET SHEAR AREA OF THE WEB SHALL BE VERIFIED.
  - THE CAPACITY OF THE CONNECTION SHALL BE THE LESSER VALUE OF THE ALLOWABLE BOLT CAPACITY, ALLOWABLE WELD CAPACITY, SUPPORTING PLATE CAPACITY OR THE WEB NET SHEAR AREA CAPACITY.
  - THE MINIMUM NUMBER OF ROWS OF BOLTS SHALL BE AS FOLLOWS:

W10 & W12	2 ROWS
W14 & W16	3 ROWS
W18, W21, & W24	4 ROWS
W27 & W30	5 ROWS
W33 & W36	6 ROWS

3/4" Ø A325 BOLTS - BEARING CONN. - STANDARD HOLES

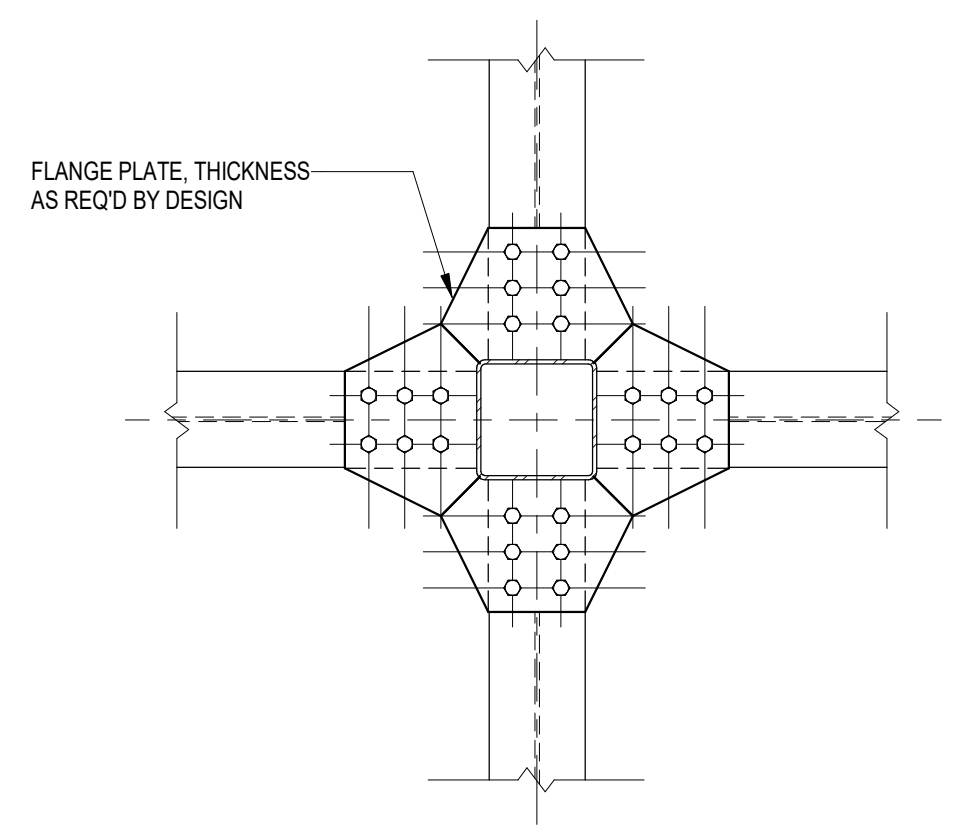


- NOTES:-**
- BOTH THE WELDS & THE BOLTS TO BE DESIGNED FOR MOMENT CAUSED BY ECCENTRICITY BETWEEN WELD GROUP & BOLT CENTERLINE.
  - END REACTION TO BE DETERMINED PER GENERAL NOTES SHEET OR AS SHOWN ON PLANS.

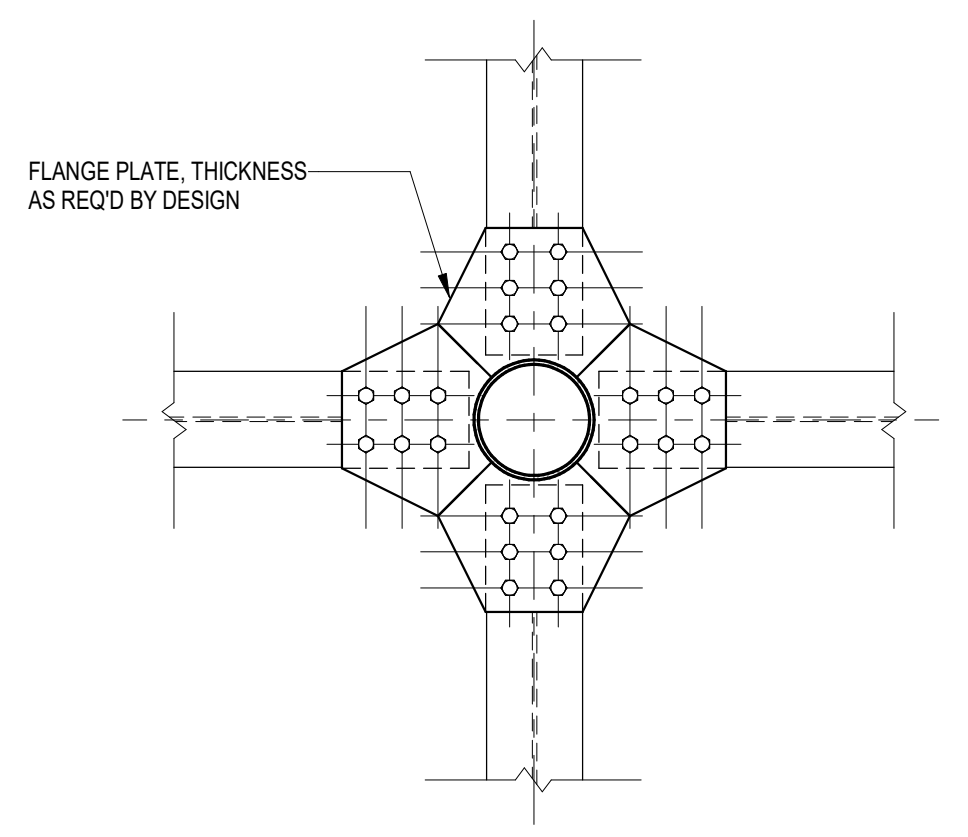


- NOTES:**
- CONN. TO BE ADEQUATE FOR AXIAL BRACING FORCE = 1% OF WORKING COLUMN LOAD IN ADDITION TO END REACTION DETERMINED PER STEEL GENERAL NOTES SHEET (U.N.O. ON DWG). ALLOWABLE STRESS CAN BE INCREASED 15% FOR THIS CONDITION. COLUMN LOAD WILL BE FURNISHED OR CAN BE DETERMINED FROM AISC MANUAL FOR FLOOR TO FLOOR HEIGHT.
  - SINGLE PLATE CONNECTION IS ALLOWED ONLY WHEN AXIAL FORCE BRACING THE COLUMN IS LESS THAN 20 KIPS. THE DESIGN OF SINGLE PLATE CONNECTION WITH AXIAL FORCE LESS THAN 20 KIPS SHOULD BE SUBSTANTIATED BY CALCULATION AND IS SUBJECT TO ENGINEER'S APPROVAL.
- 3/4" Ø A325 BOLTS - BEARING CONN. - STANDARD HOLES

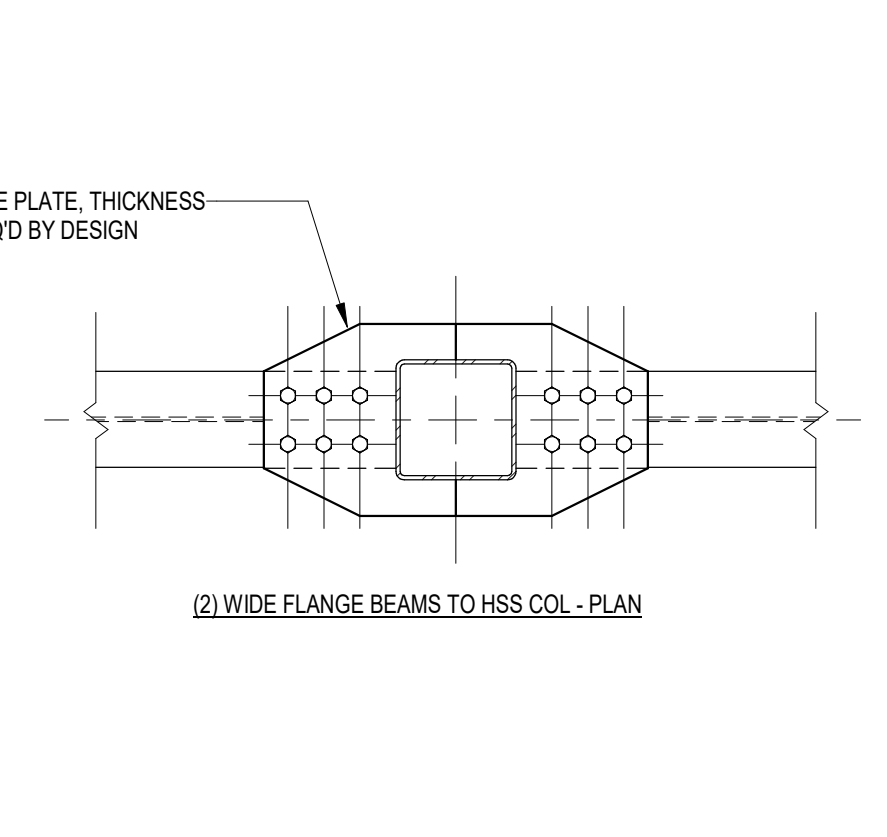
**1 STANDARD BEAM CONNECTION**  
3/4" = 1'-0"



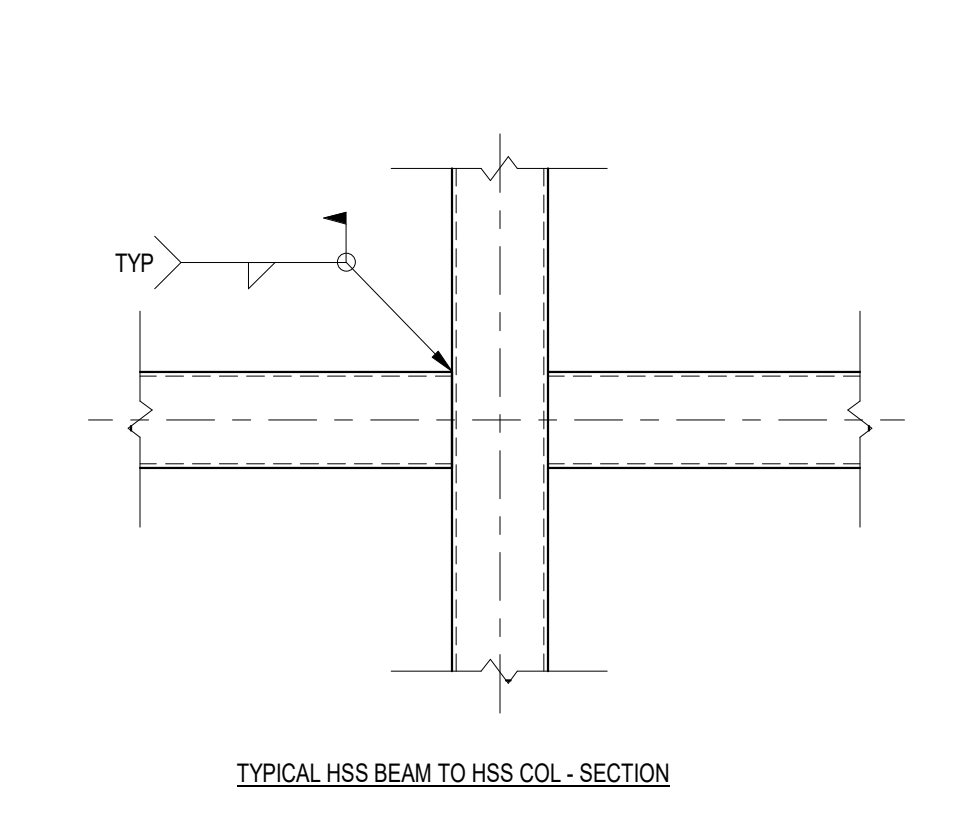
(1) WIDE FLANGE BEAMS TO HSS COL. - PLAN



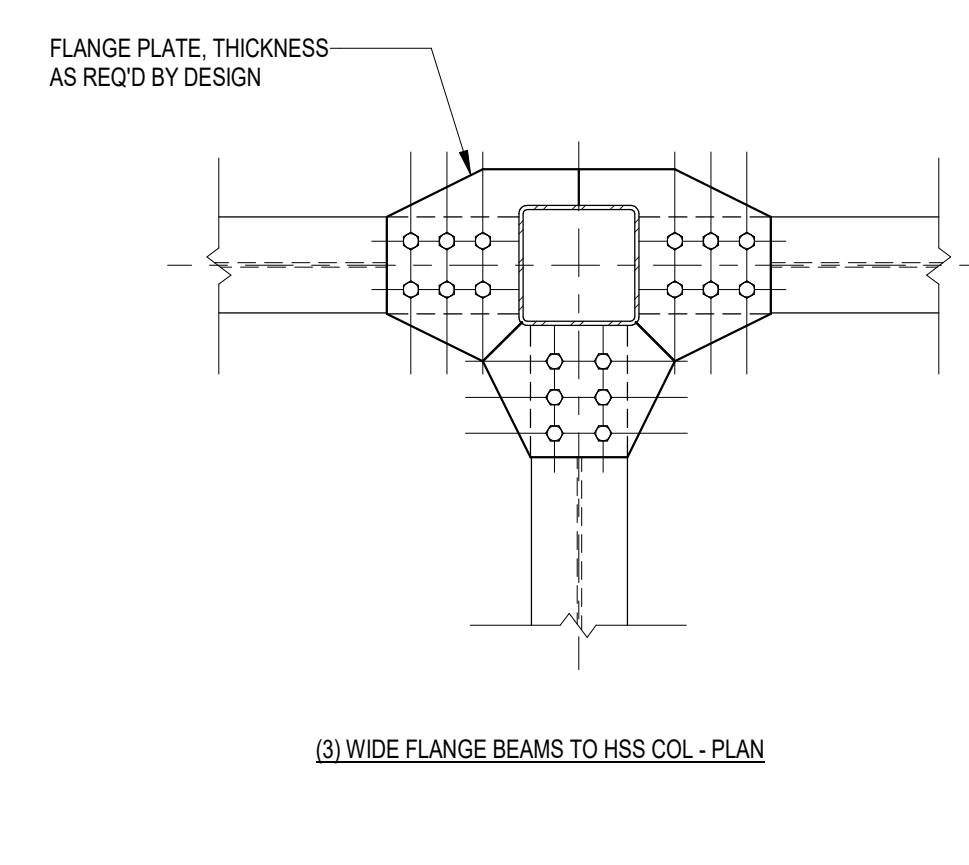
(2) WIDE FLANGE BEAMS TO ROUND HSS COL. - PLAN



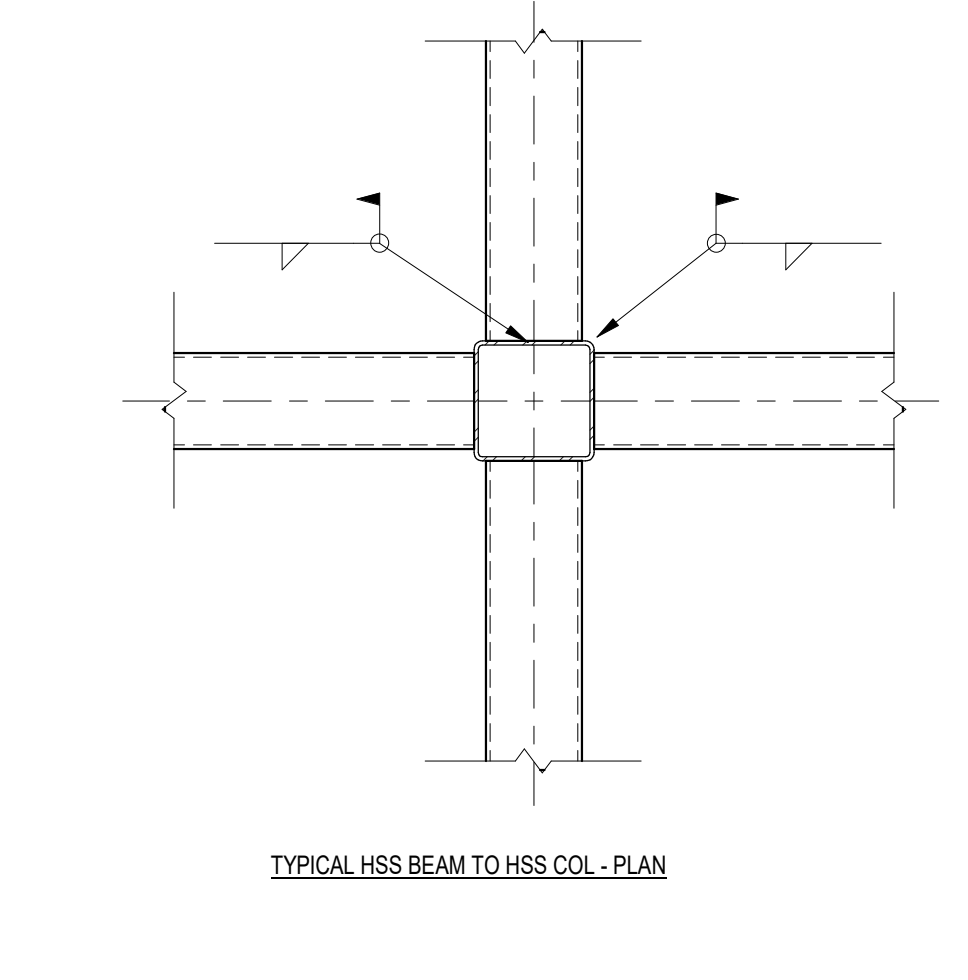
(3) WIDE FLANGE BEAMS TO HSS COL. - SECTION



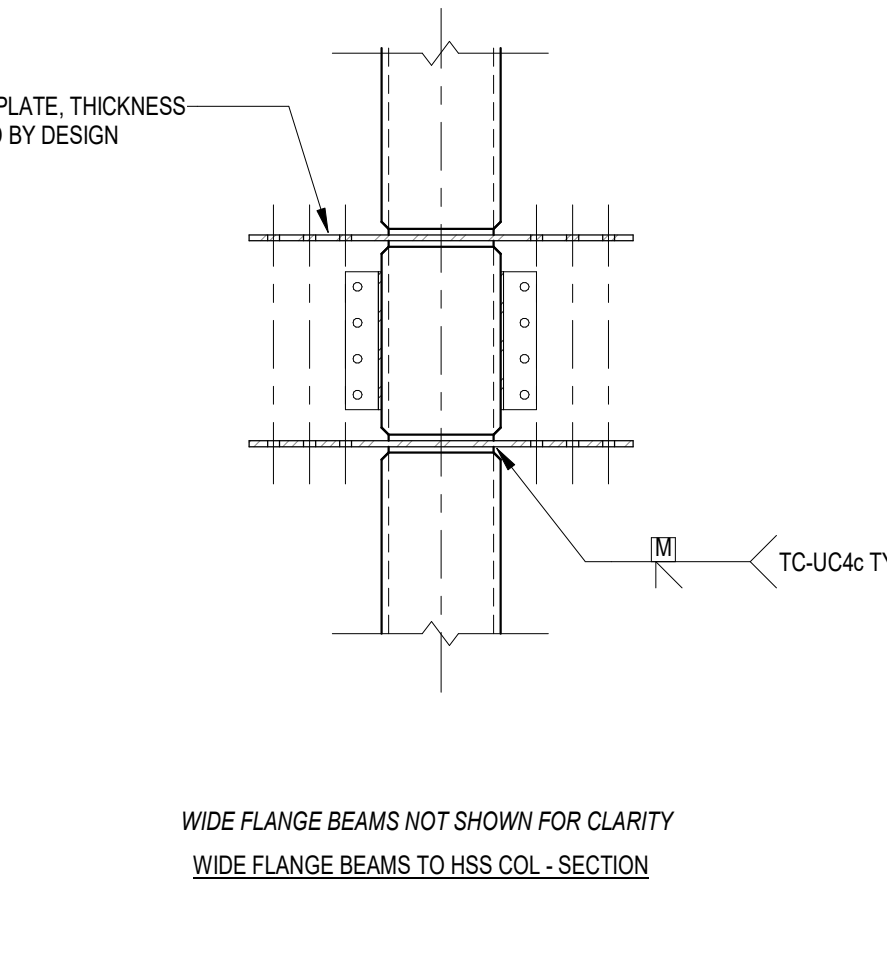
TYPICAL HSS BEAM TO HSS COL. - SECTION



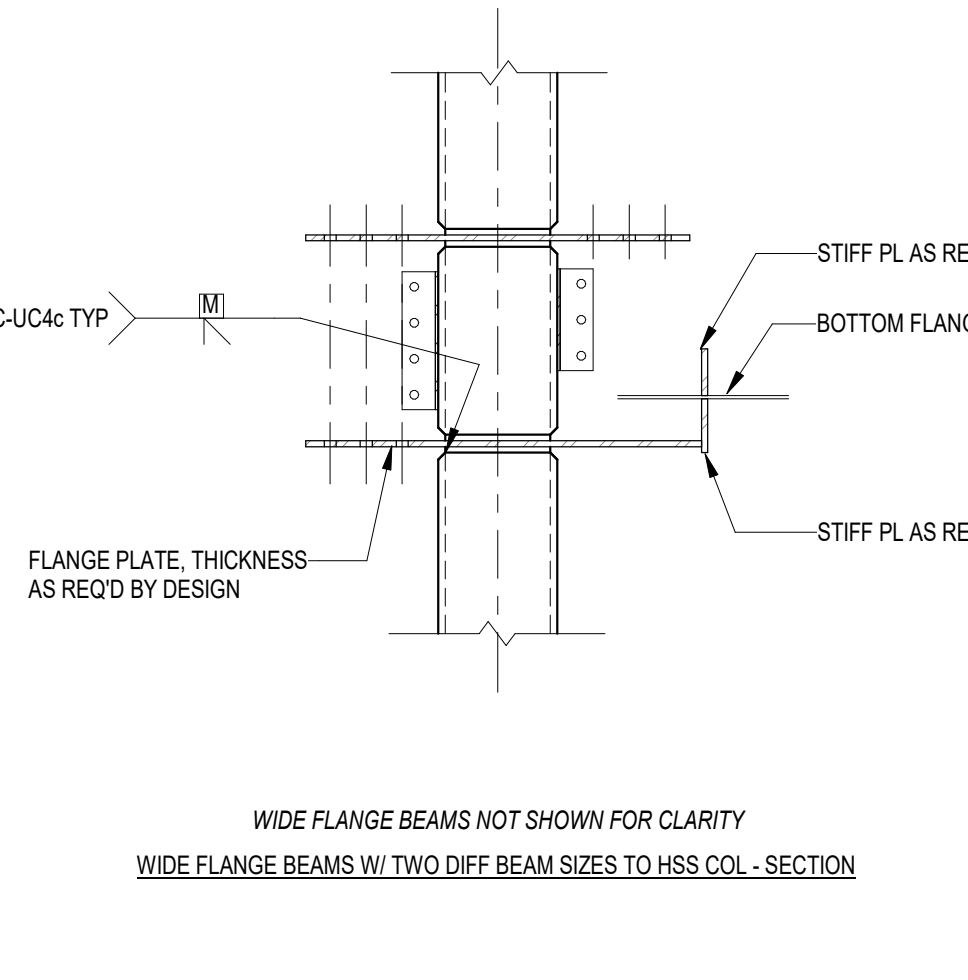
(5) WIDE FLANGE BEAMS TO HSS COL. - PLAN



TYPICAL HSS BEAM TO HSS COL. - PLAN

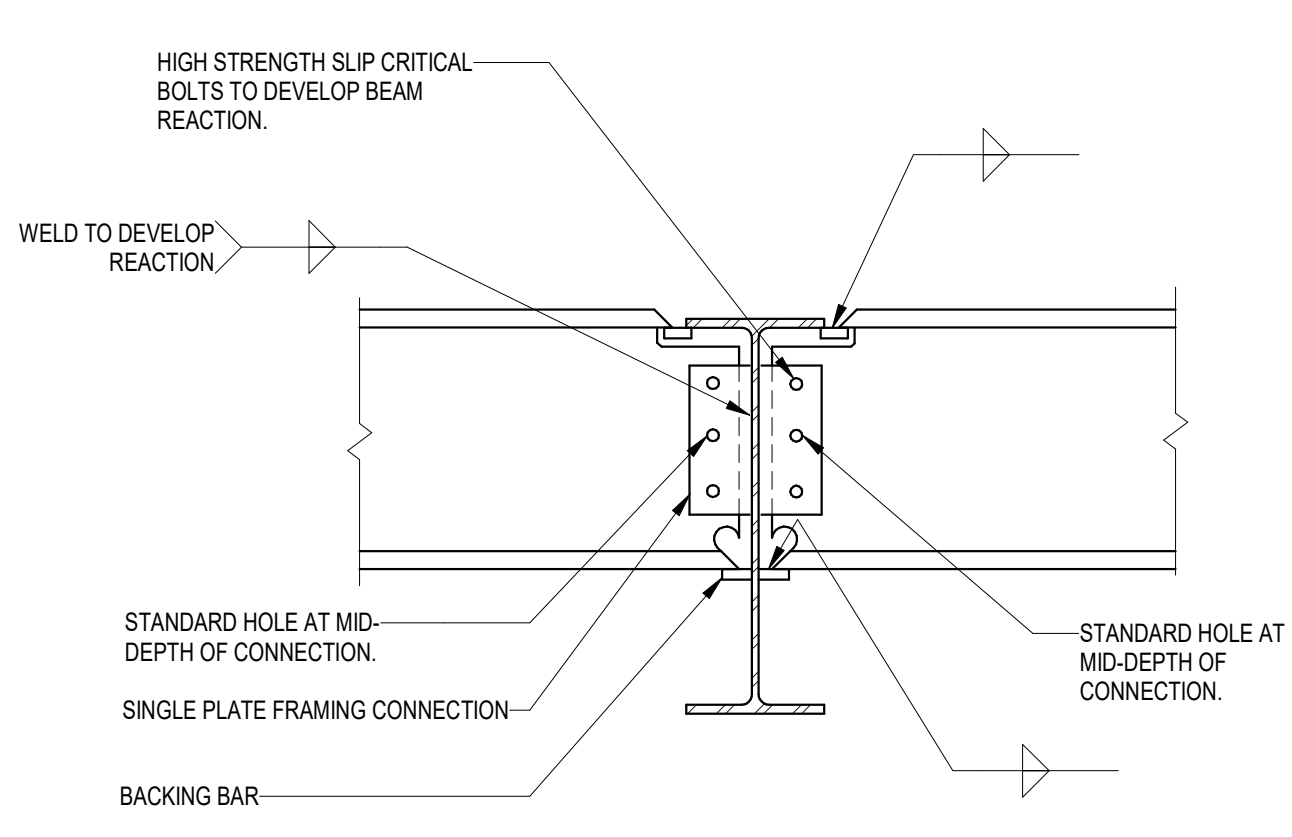


WIDE FLANGE BEAMS NOT SHOWN FOR CLARITY  
WIDE FLANGE BEAMS TO HSS COL. - SECTION



WIDE FLANGE BEAMS NOT SHOWN FOR CLARITY  
WIDE FLANGE BEAMS W/ TWO DIFF BEAM SIZES TO HSS COL. - SECTION

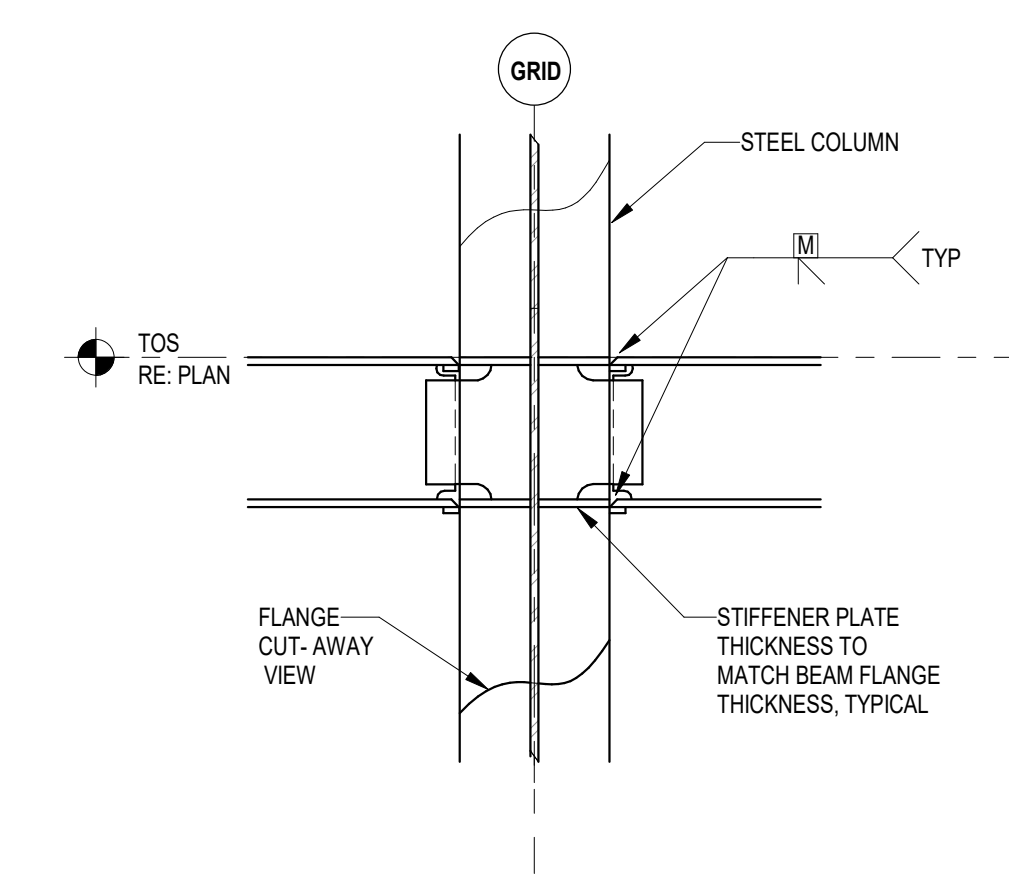
**3 TYPICAL BEAM TO COLUMN CONN. @ FLANGE & WEB**  
N.T.S.



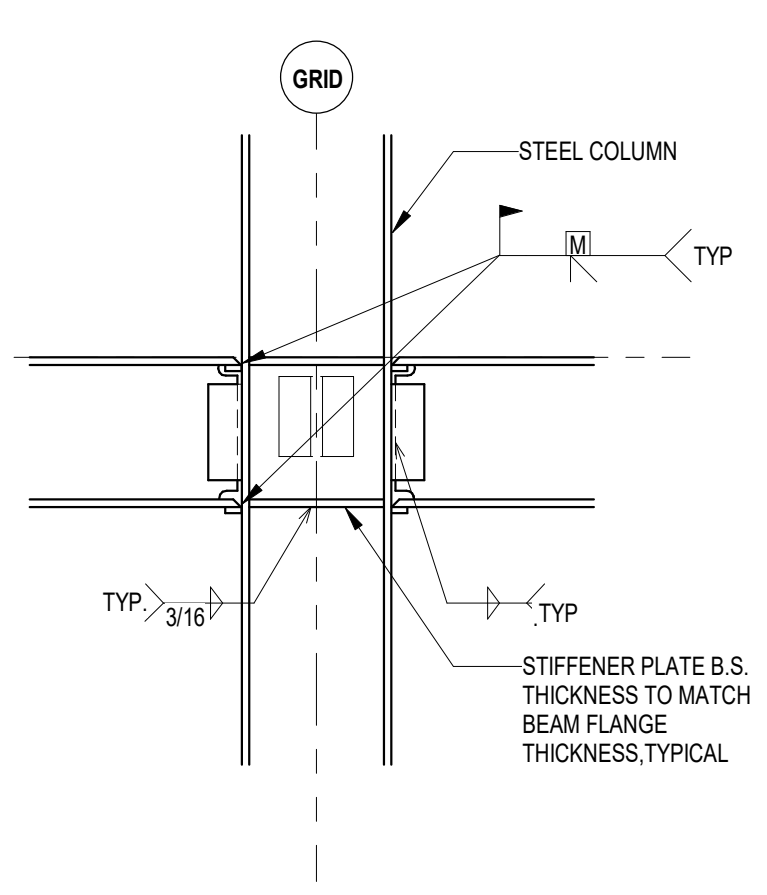
BEAM TO BEAM MOMENT CONNECTION BEAMS OF THE SAME NOMINAL DEPTH - SECTION

- NOTES:**
- BOLTS IN WEB CONNECTION SHALL BE SNUG TIGHTENED PRIOR TO WELDING OF FLANGES.
  - SLIP CRITICAL BOLTED CONNECTION IN WEB USING A325 BOLTS IN HORIZONTAL SHORT-SLOTTED HOLES (U.O. RESISTANCE BY BOLTS TO SHEAR SHALL BE BY FRICTION, PROPORTIONED USING THE STANDARD HOLE VALUE ON A CLASS 'A' SURFACE.
  - REFER TO SPECIFICATIONS FOR CONNECTION DESIGN CRITERIA.
  - PROVIDE PREDESIGNED SHEAR CONNECTIONS AS SHOWN IN AISC LRFD MANUAL WHERE APPLICABLE.
  - IF MOMENT IS SHOWN ON DRAWINGS, PARTIAL PENETRATION WELD TO DEVELOP MOMENT CAN BE USED IN LIEU OF C/P WELD. FOR THIS CASE, WELD SHALL BE REQUIRED TO DEVELOP THE BEAM FLANGE FORCE COMPUTED AS FOLLOWS:  $P_u = (M_u / D) (0.850)$ , WHERE:  $M_u$  = DESIGN MOMENT (KIP-IN),  $D$  = BEAM DEPTH (INCHES),  $P_u$  = BEAM FLANGE FORCE (KIPS).
  - ALL MOMENT CONNECTIONS DETAILS SHOWN IN THIS SHEET ARE FOR REFERENCE ONLY TO SHOW THE INTENT OF THE DESIGN. STEEL FABRICATOR TO DETERMINE DESIGN ALL REQUIRED BOLTING, PLATES WELDING TO REINFORCE BEAMS AND COLUMNS AS NEEDED TO ACHIEVE 100% BEAM CAPACITY AND PROVIDE SIGNED SEALED CALCULATIONS BY LICENSED ENGINEER IN STATE OF TEXAS TO EOR FOR REVIEW.

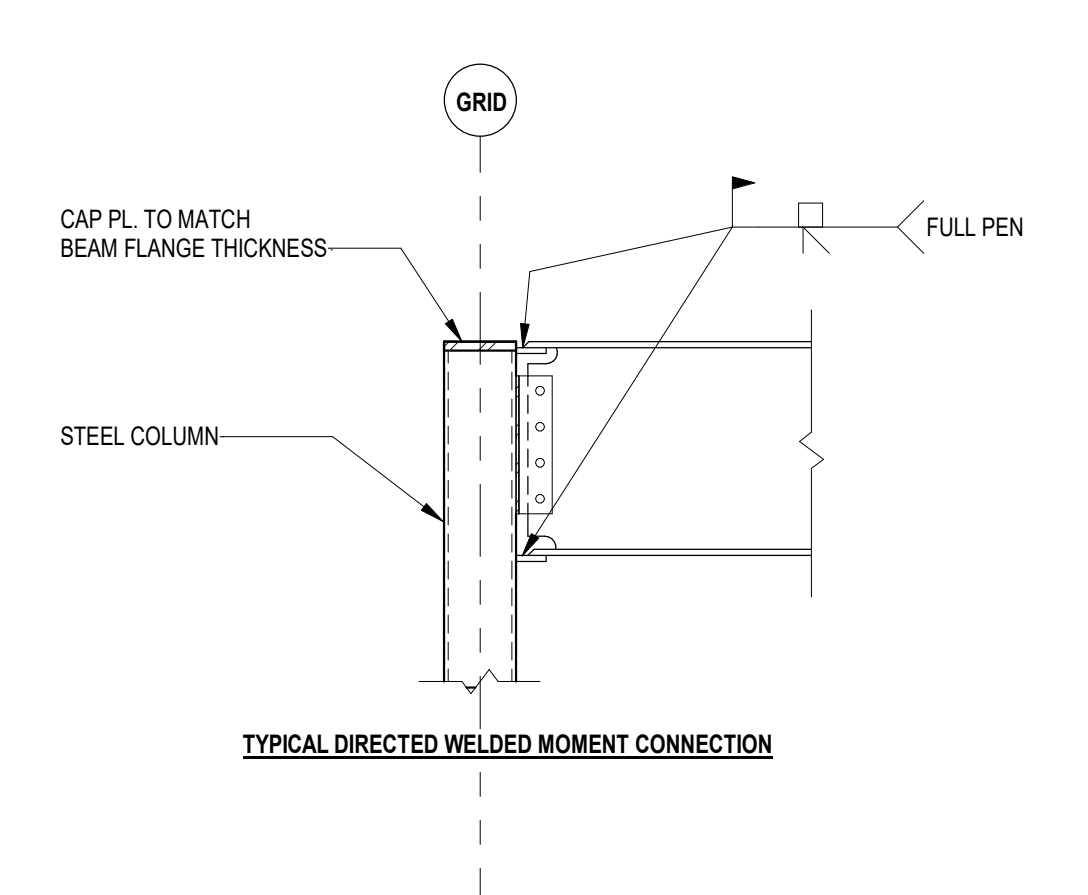
**4 MOMENT CONNECTION DETAILS**  
3/4" = 1'-0"



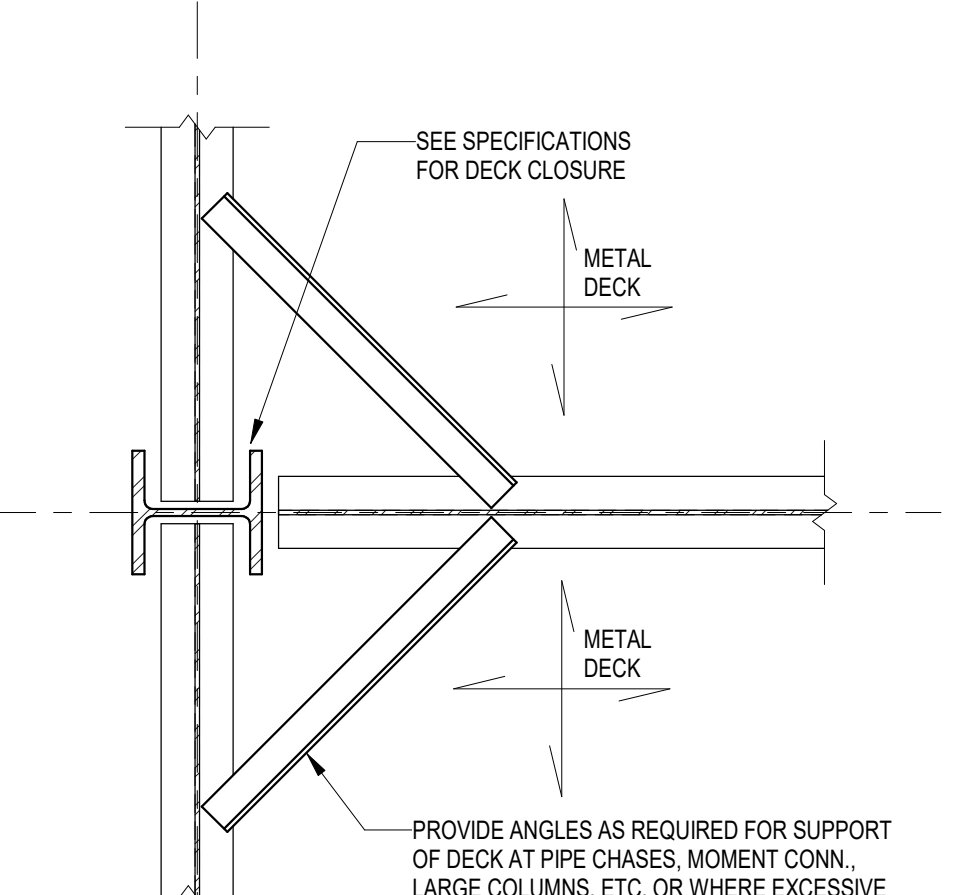
**5 TYPICAL MOMENT CONN. AT WIDE FLANGE COLUMNS**  
1/2" = 1'-0"



**6 TYPICAL DIRECT WILDED MOMENT CONN.**  
3/4" = 1'-0"



**7 TYPICAL COLUMN CAP PLATE**  
3/4" = 1'-0"



**8 METAL DECK SUPPORT AT COLUMN**  
3/4" = 1'-0"

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FBC Elections Administration Building

3700 BAMORE RD. ROSENBERG, TX 77471  
100% CONSTRUCTION DOCUMENTS

Project No.: 2330

Drawing Date: 01/17/2024  
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Scale: AS NOTED

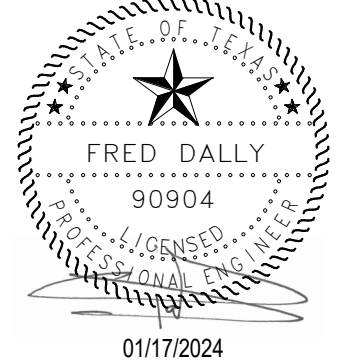
Issue Log:

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1	100%CD	01.17.2024

Revisions:

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TYPICAL FRAMING DETAILS

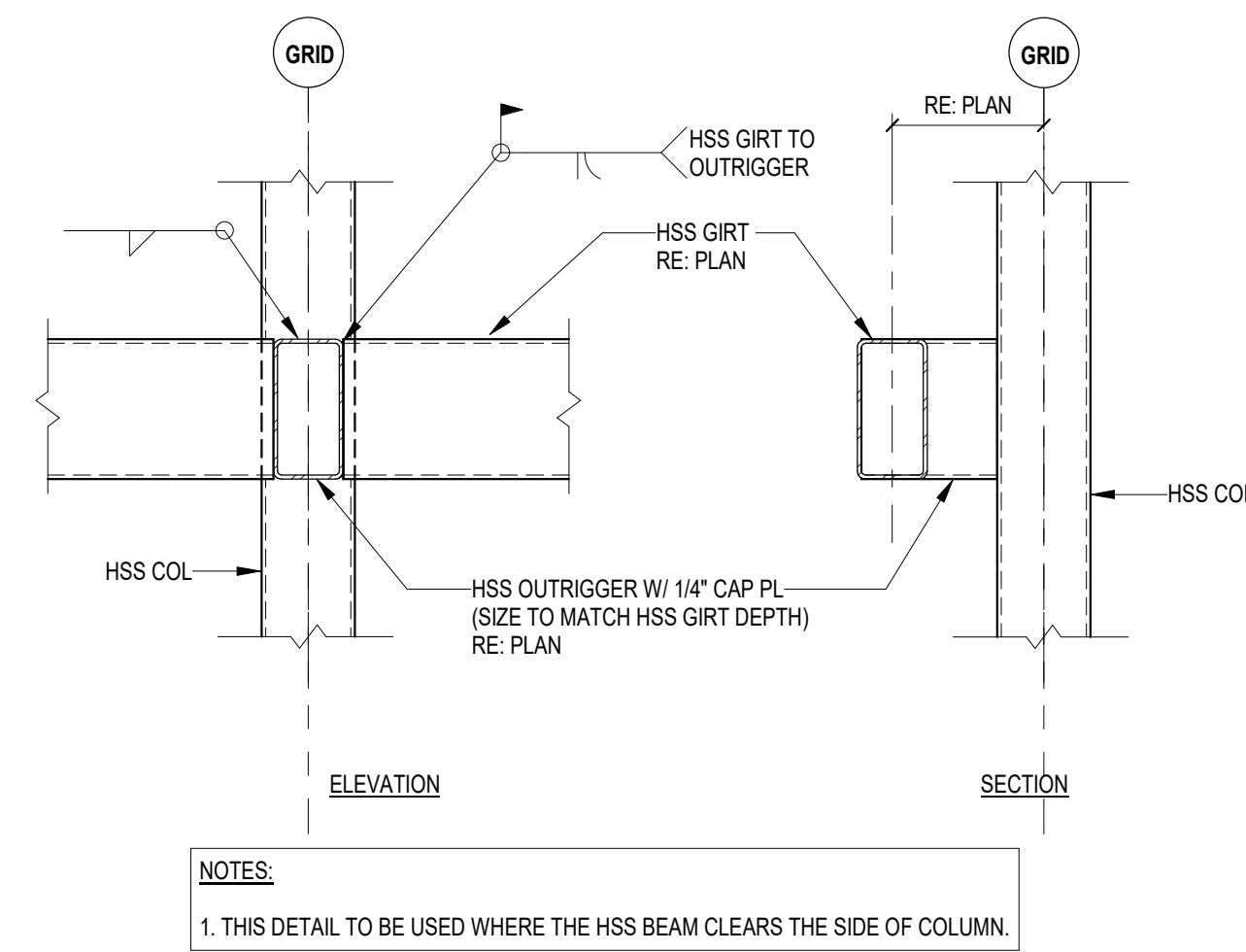


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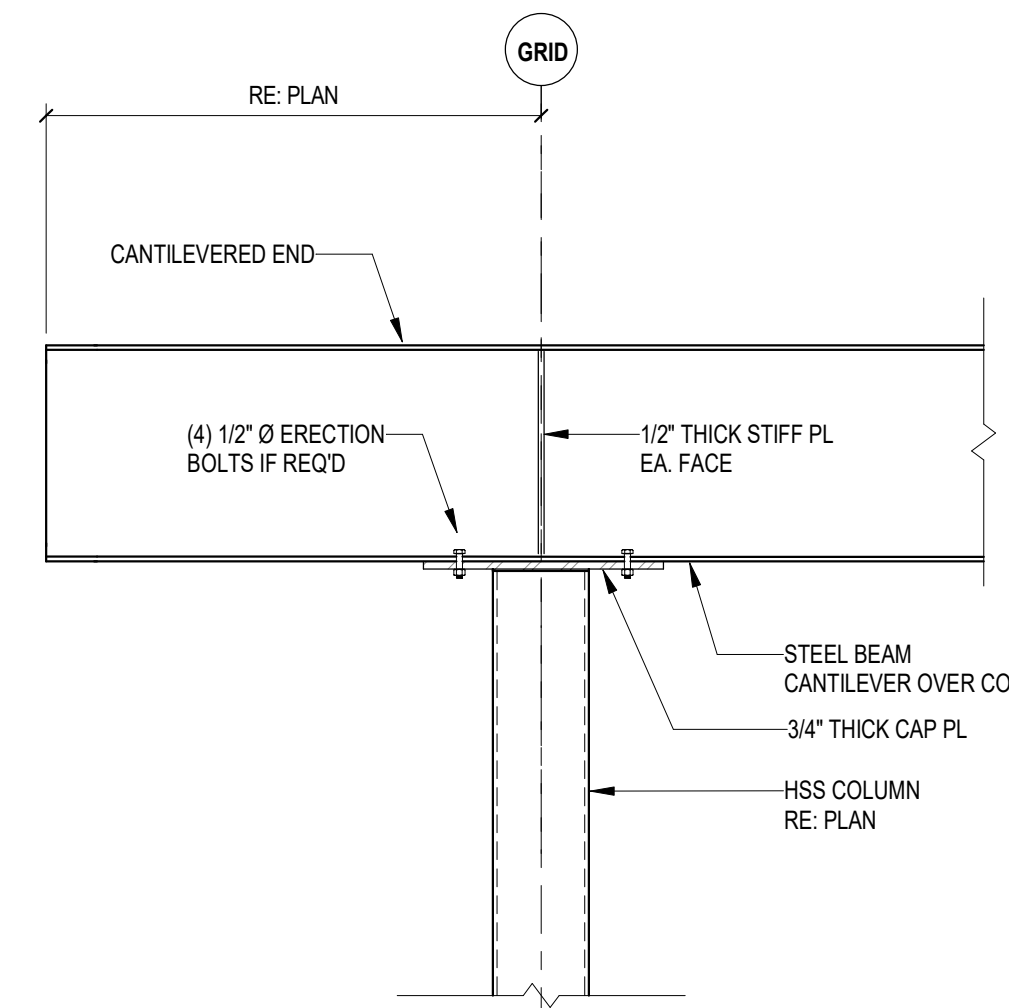
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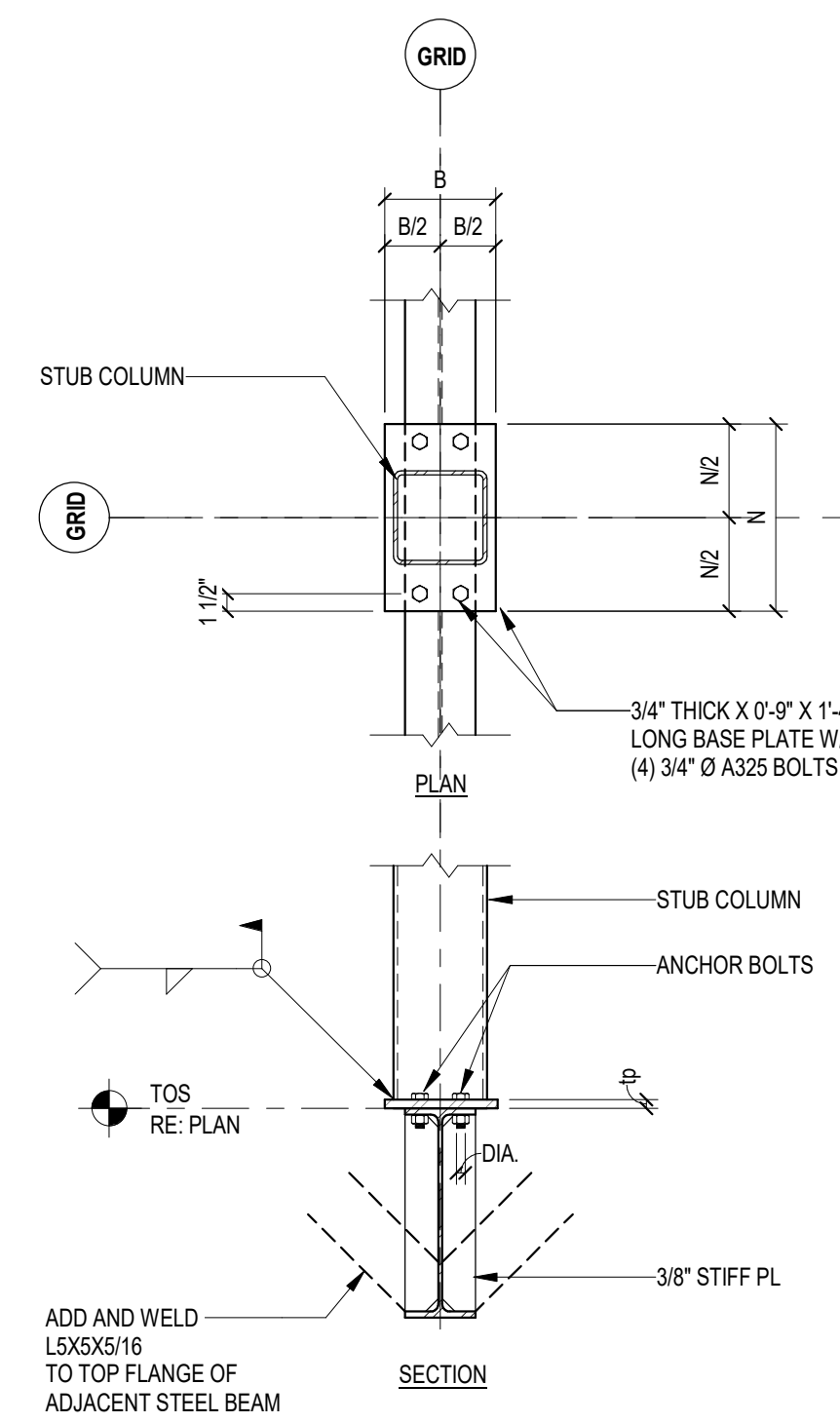
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rwheaton@wheaton-ees.com



**1** TYPICAL OFFSET HSS TUBE SUPPORT  
3/4" = 1'-0"



**2** TYPICAL CANTILEVERED BEAM  
3/4" = 1'-0"



**3** TYPICAL STUB COLUMN DETAIL  
3/4" = 1'-0"

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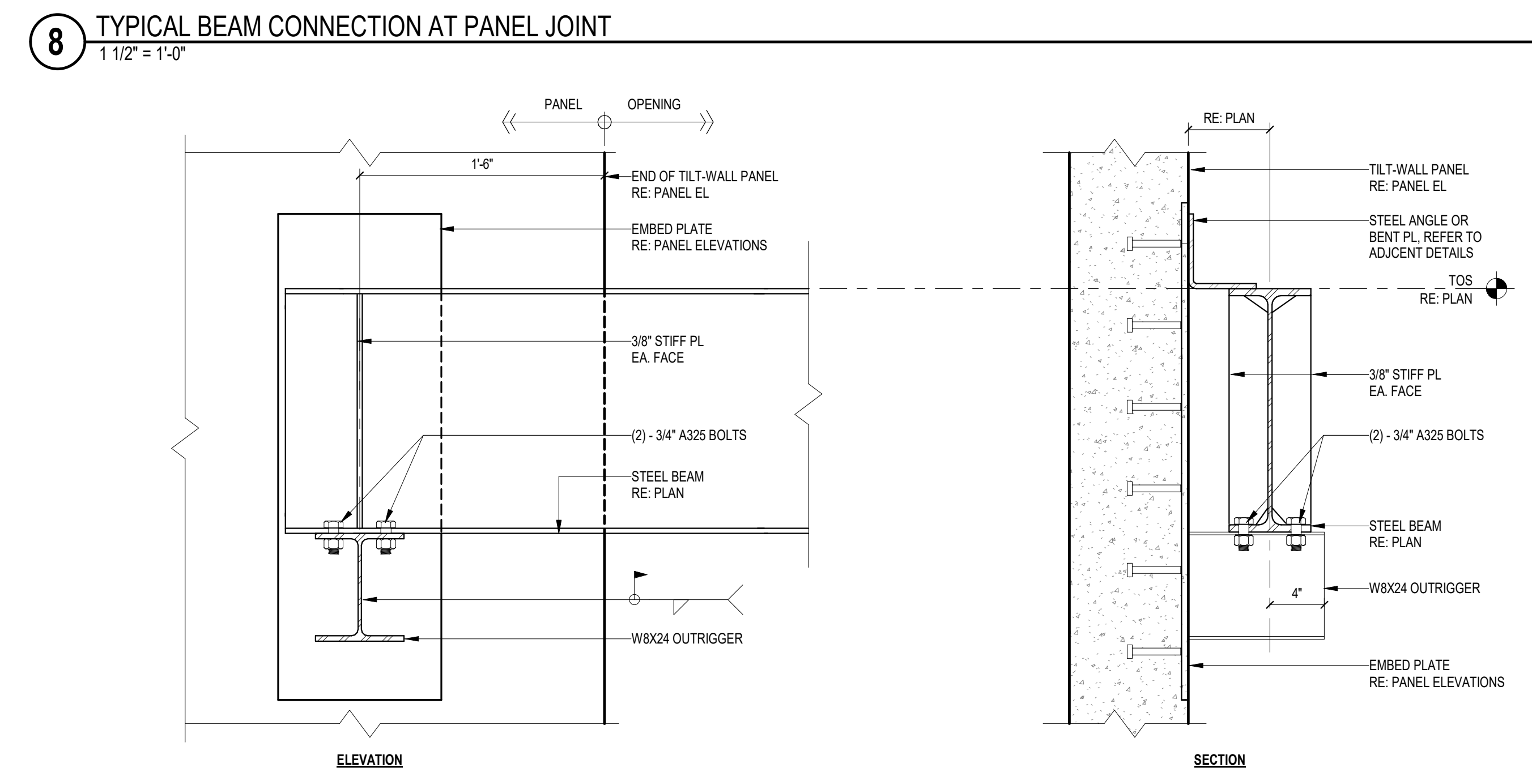
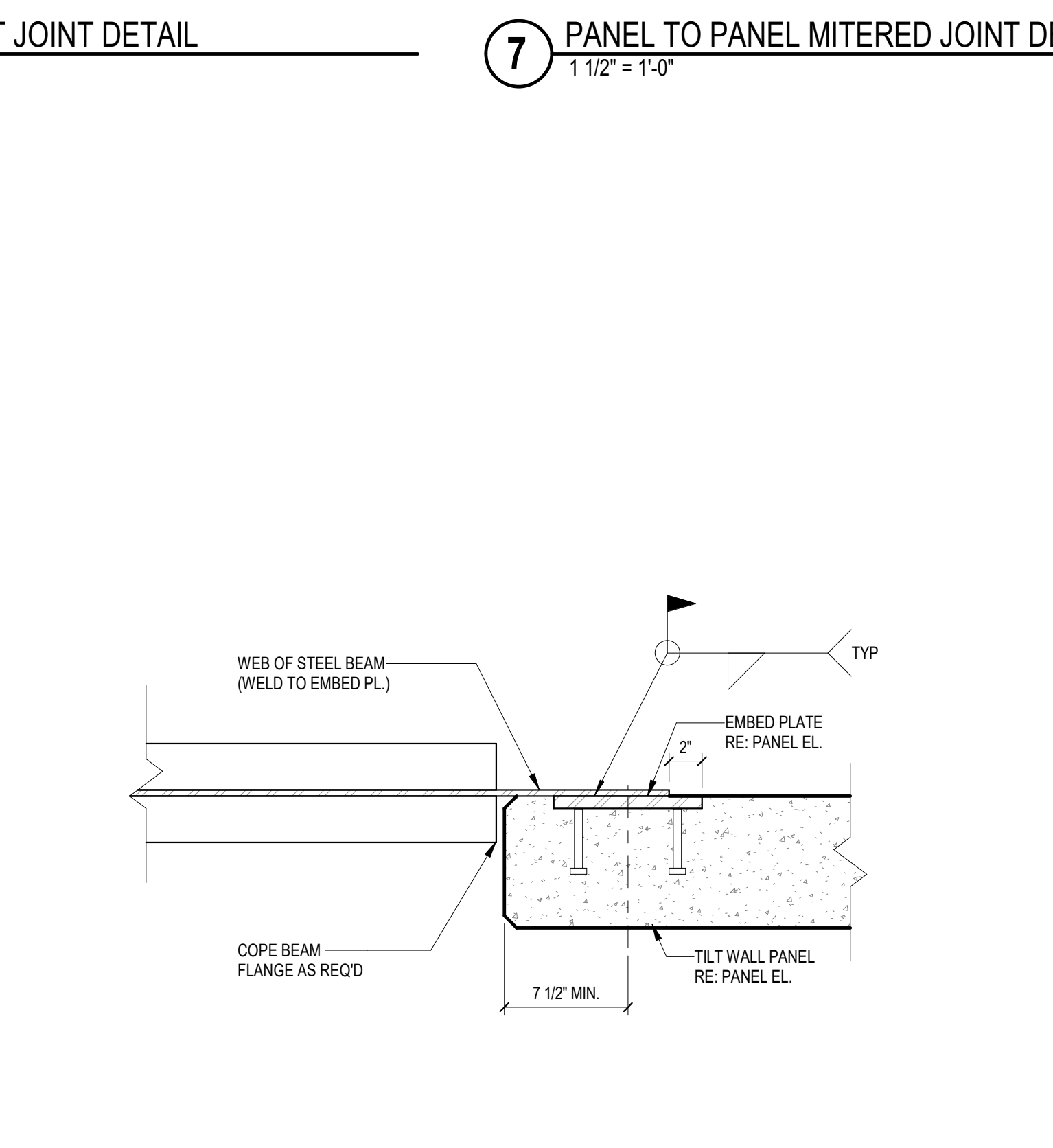
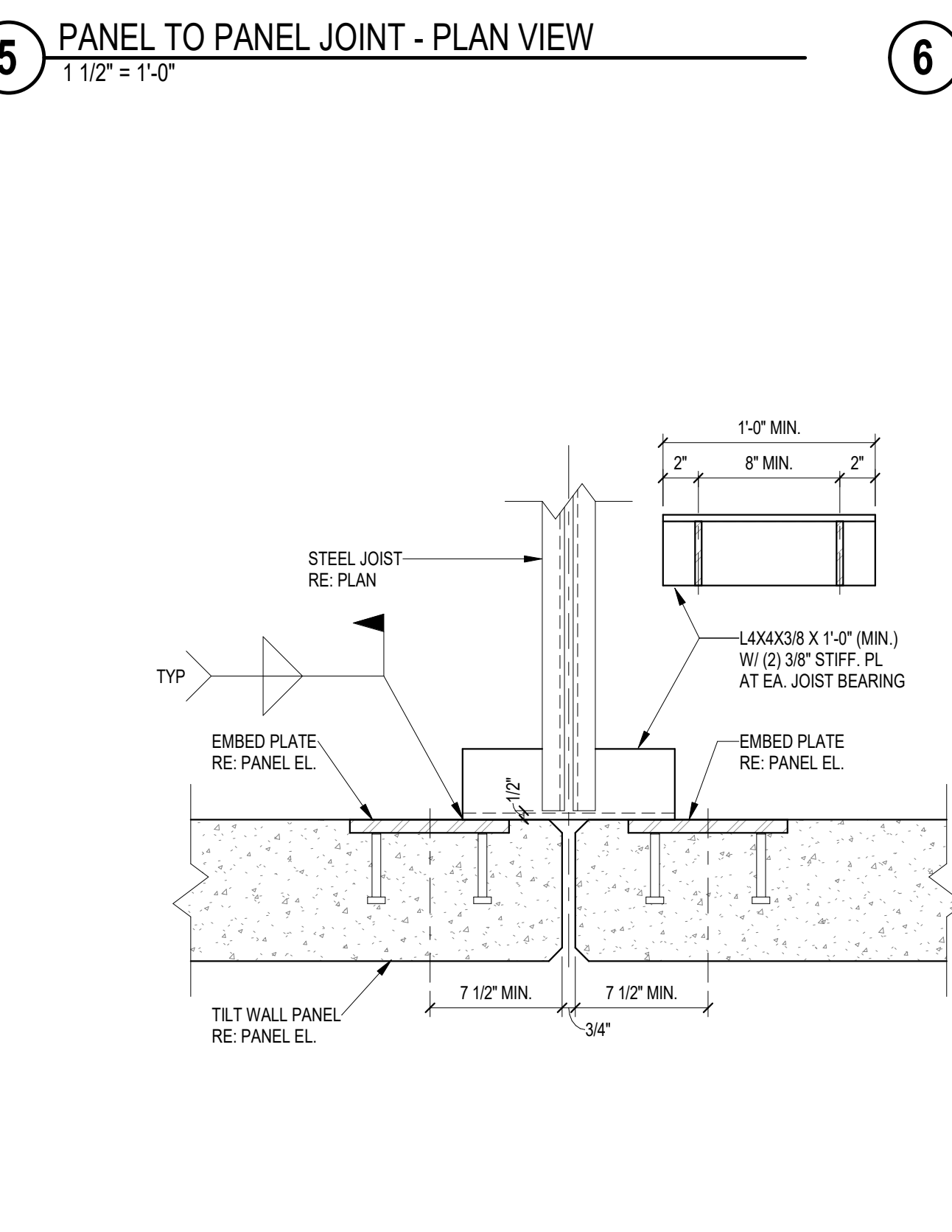
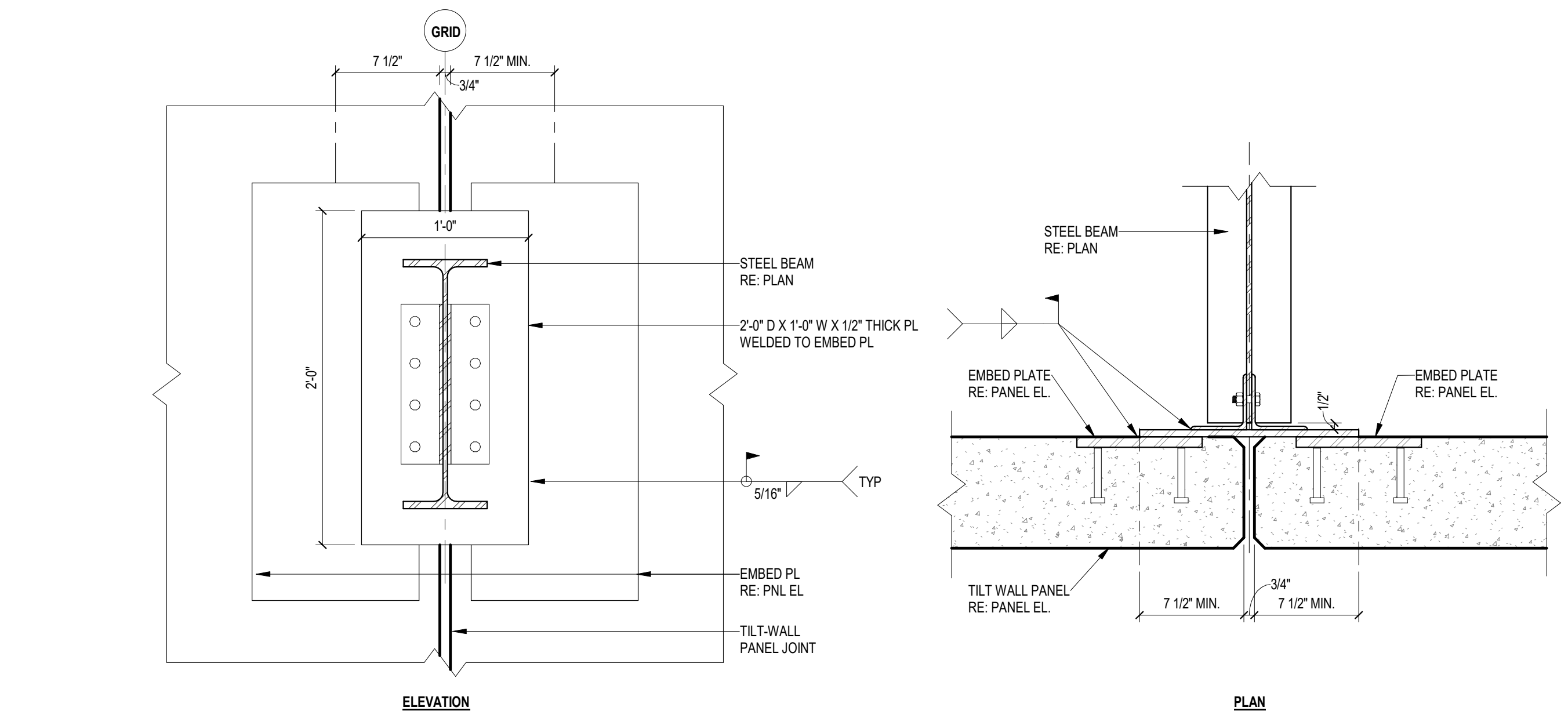
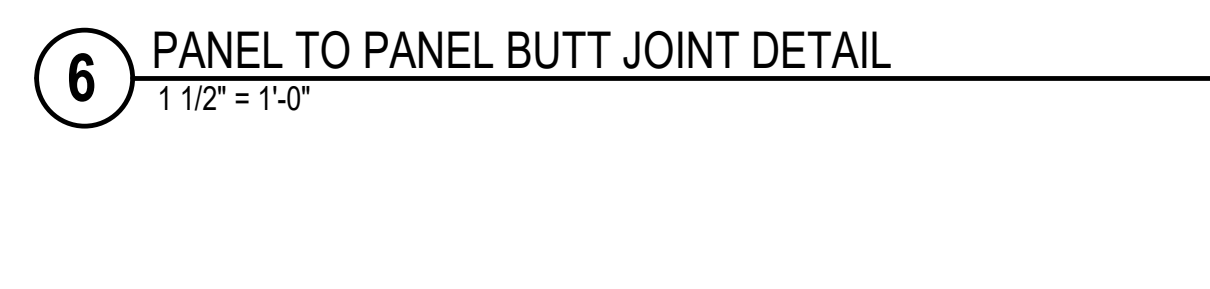
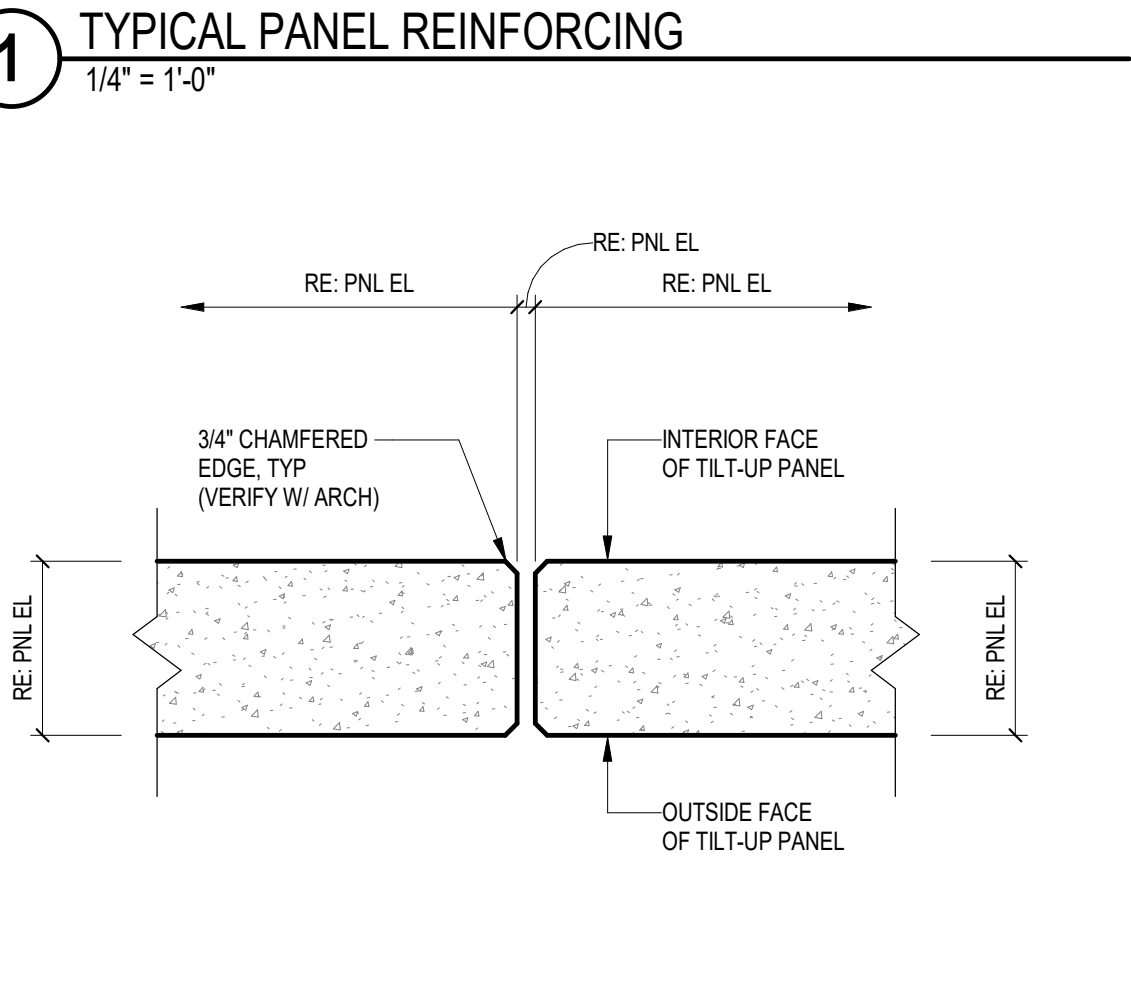
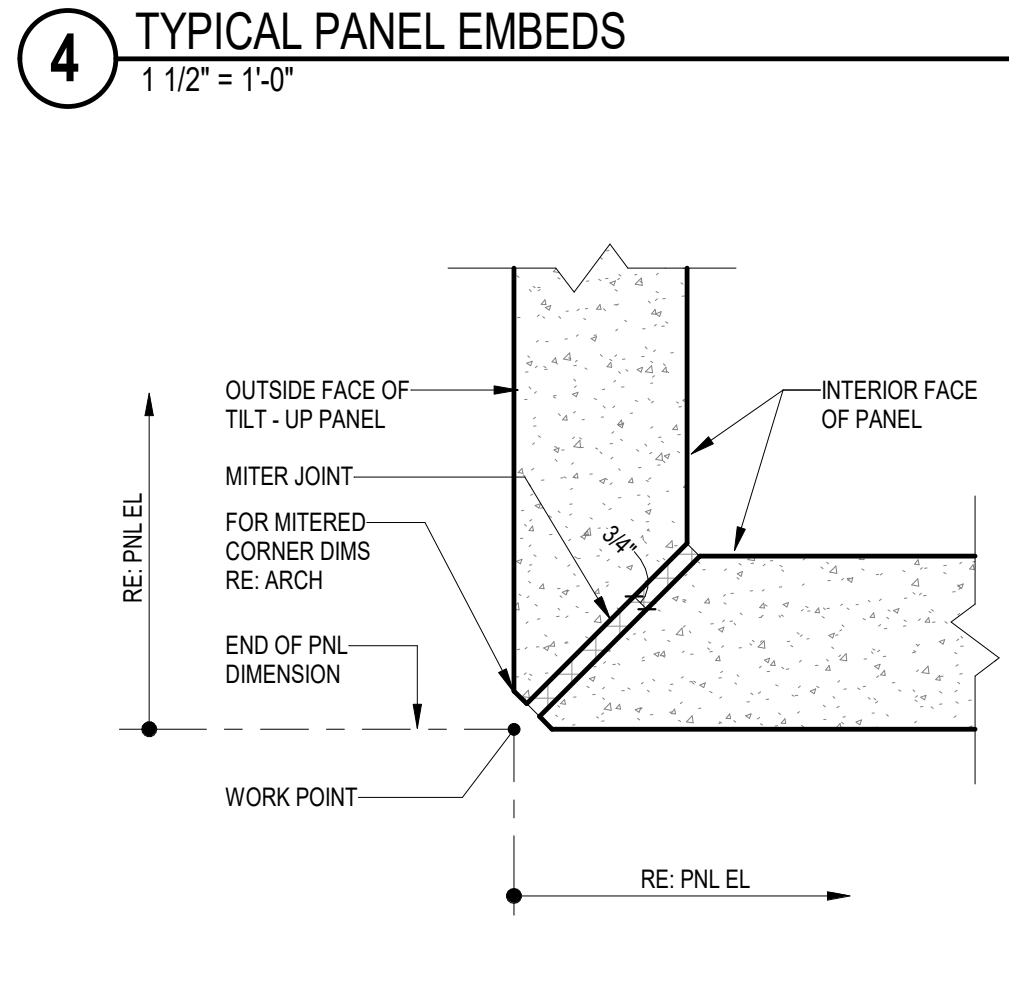
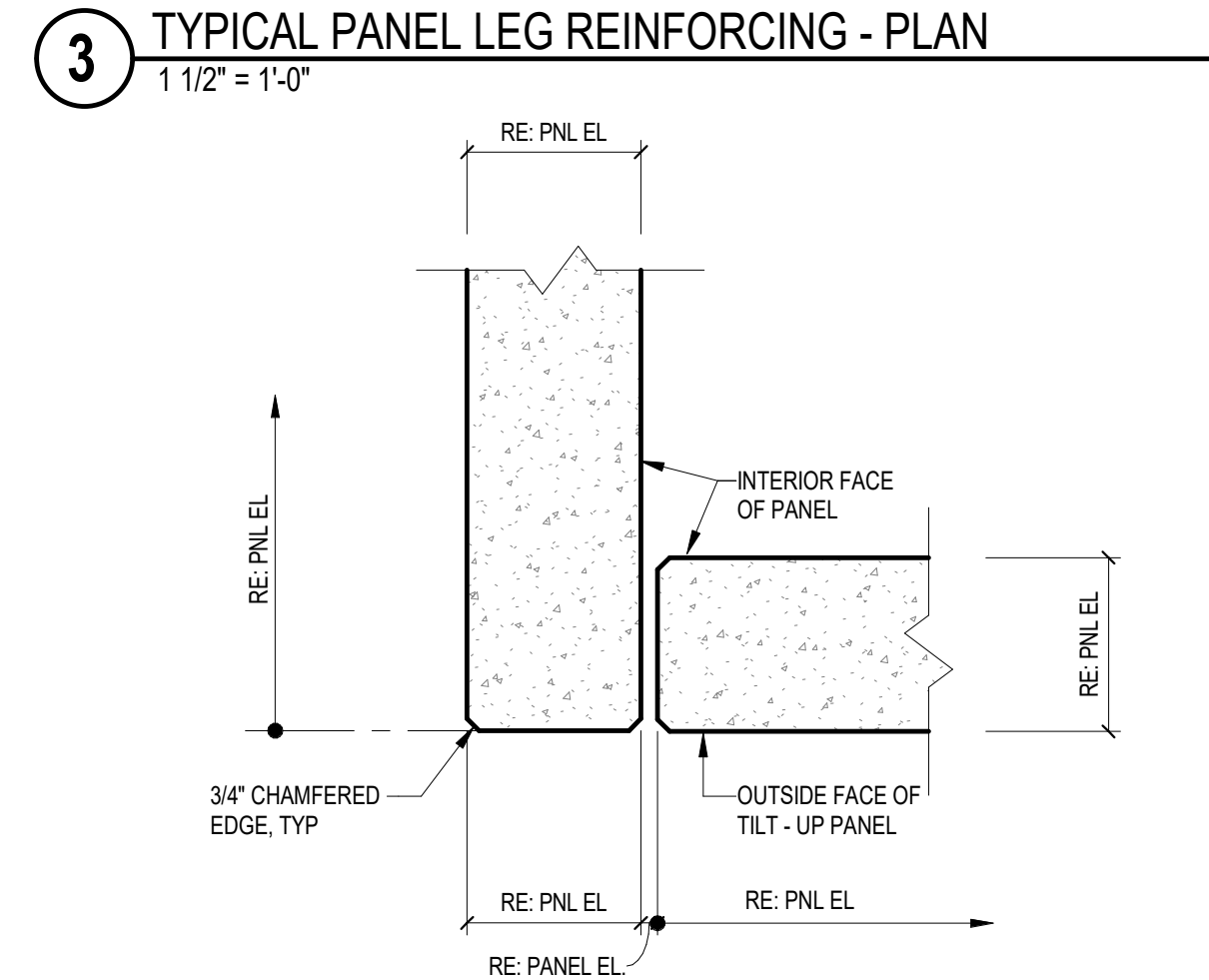
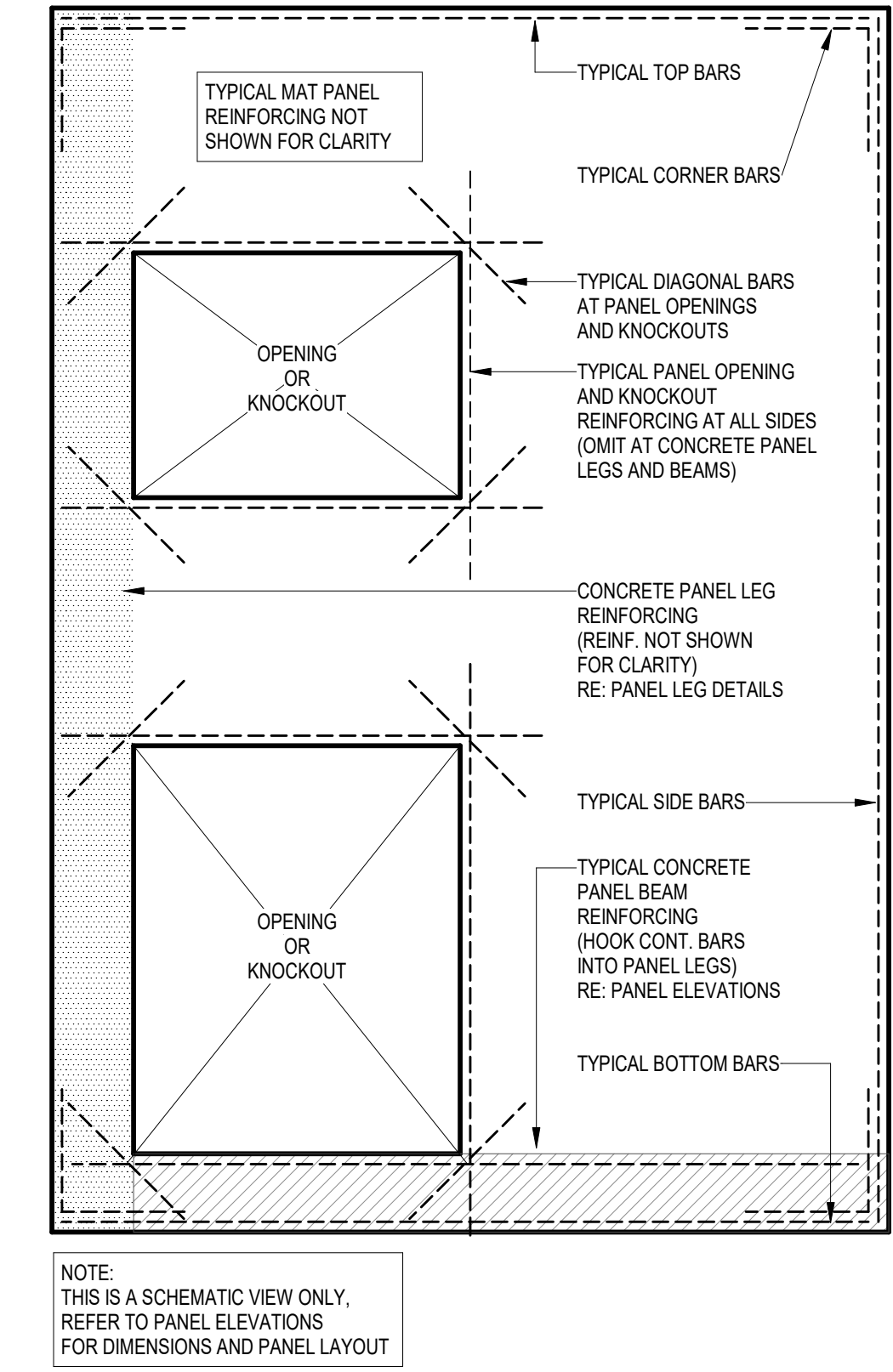
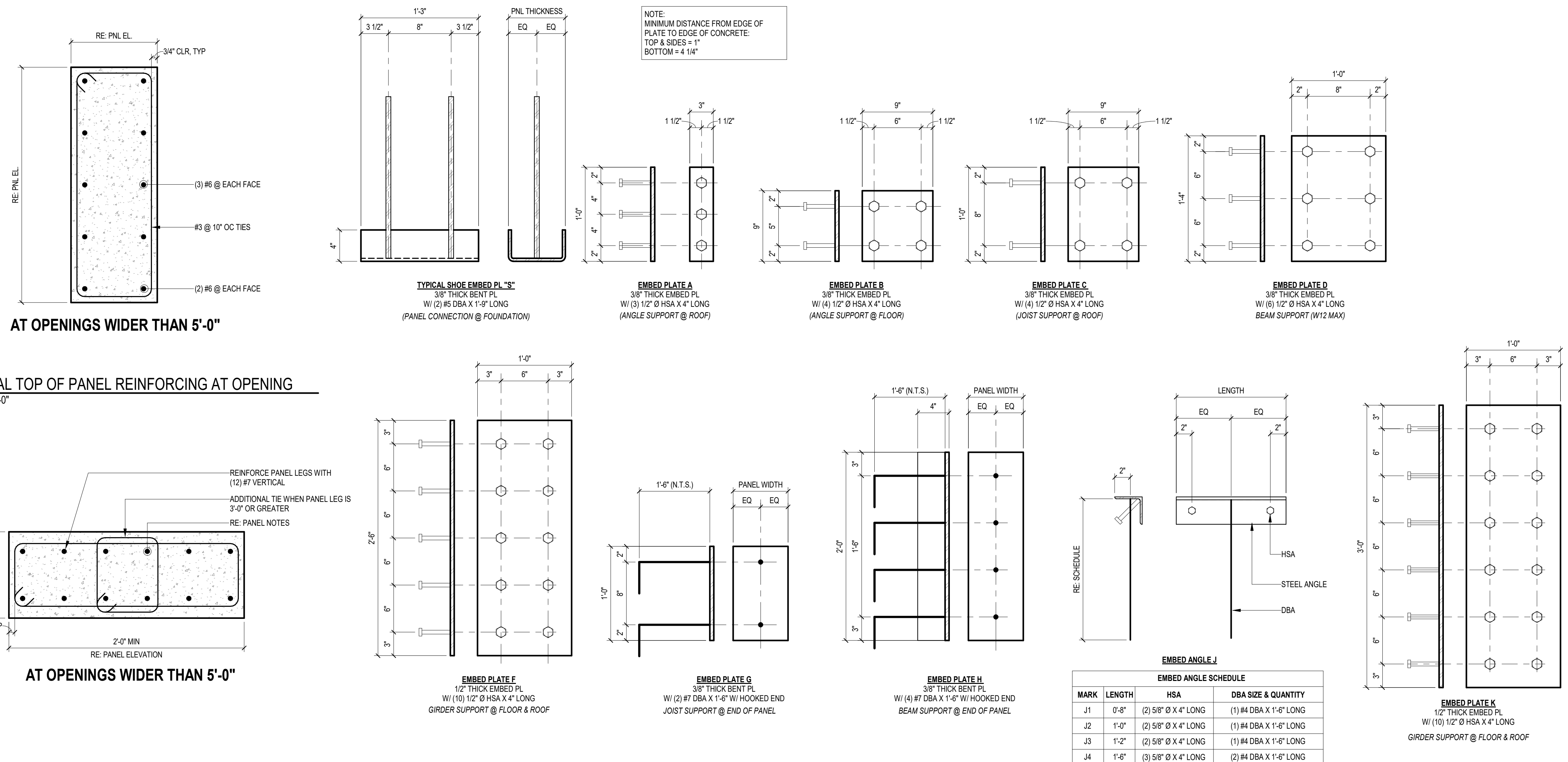
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TYPICAL TILT WALL  
DETAILS



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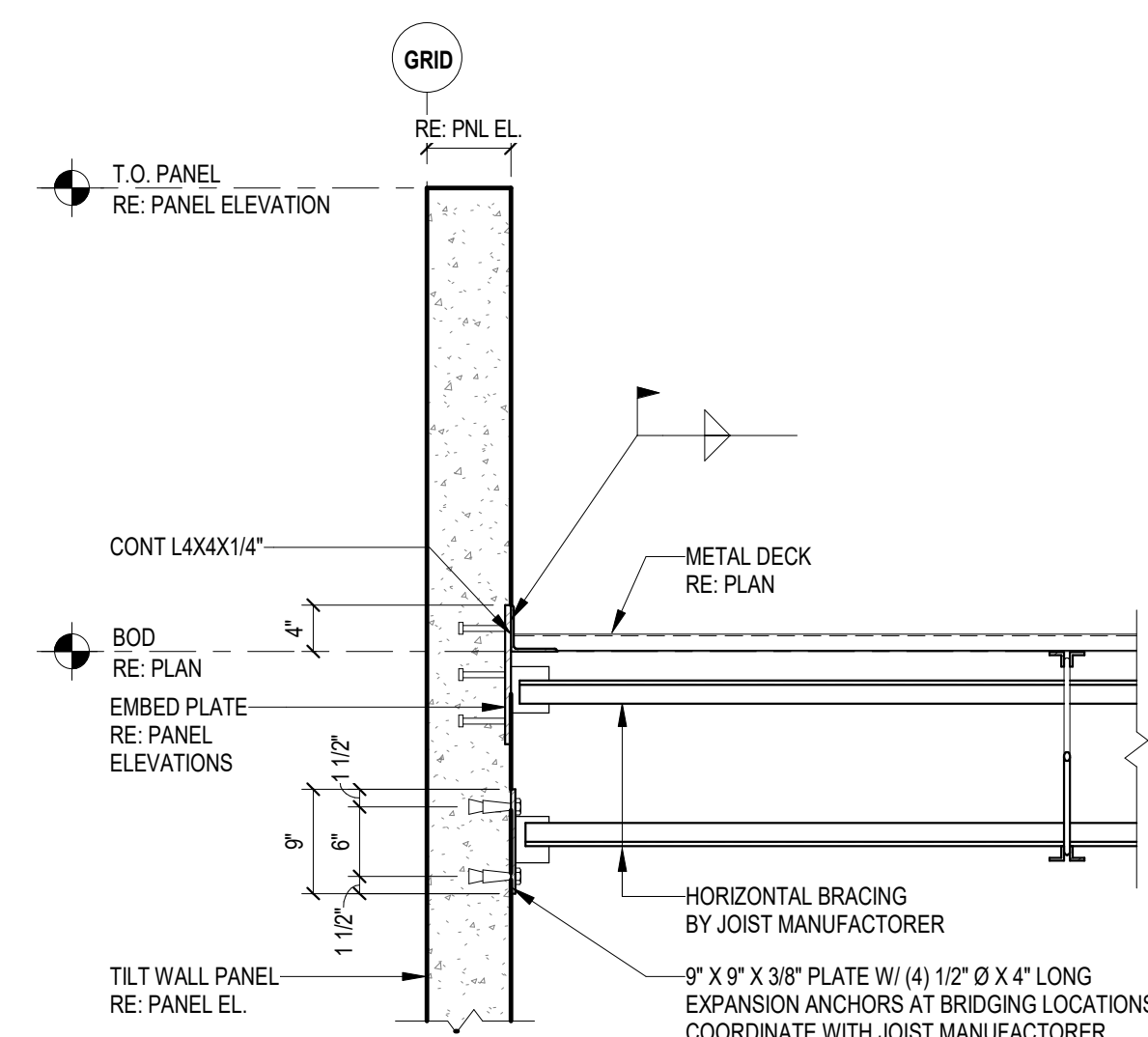
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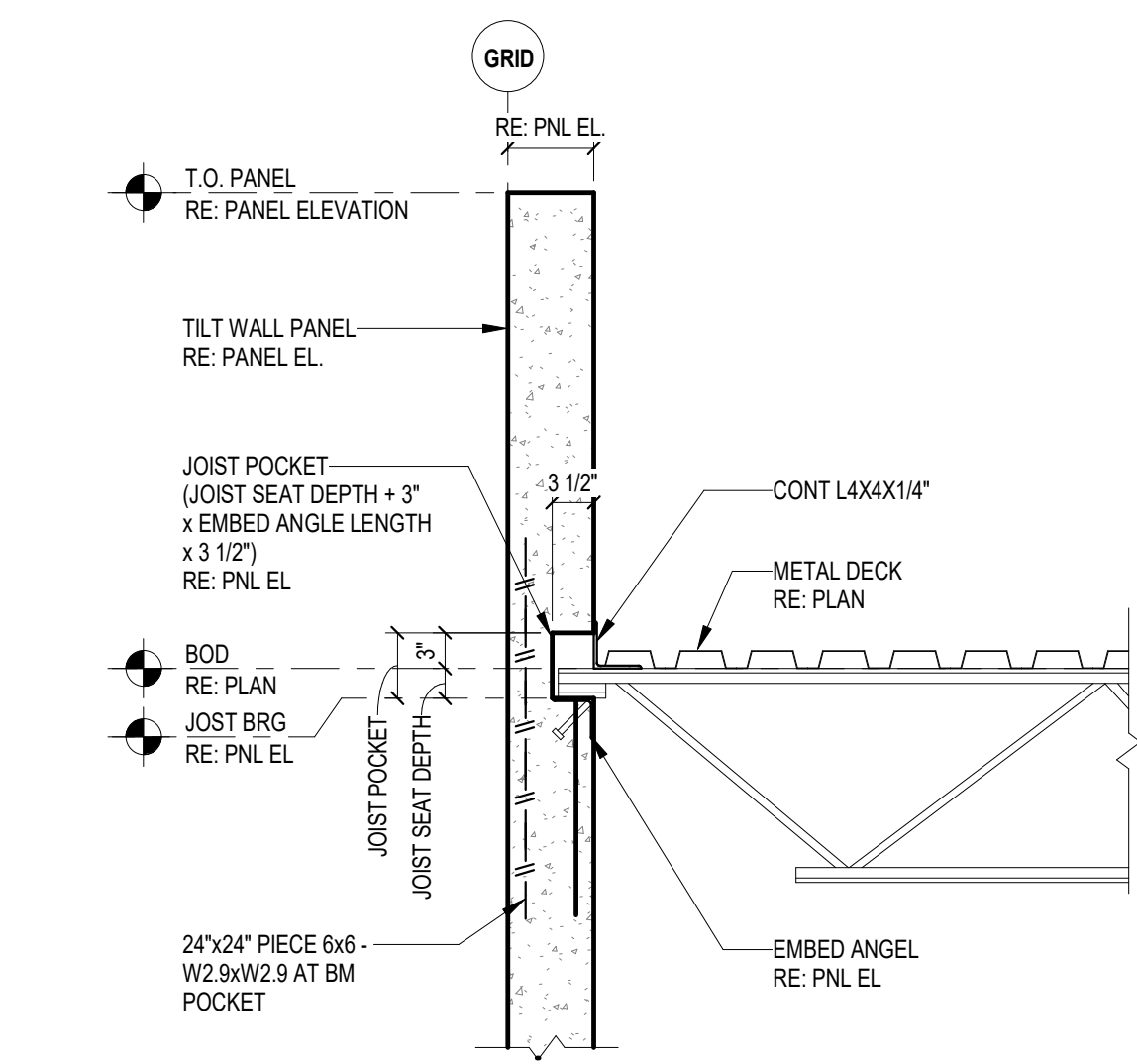
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FBC Elections Administration Building

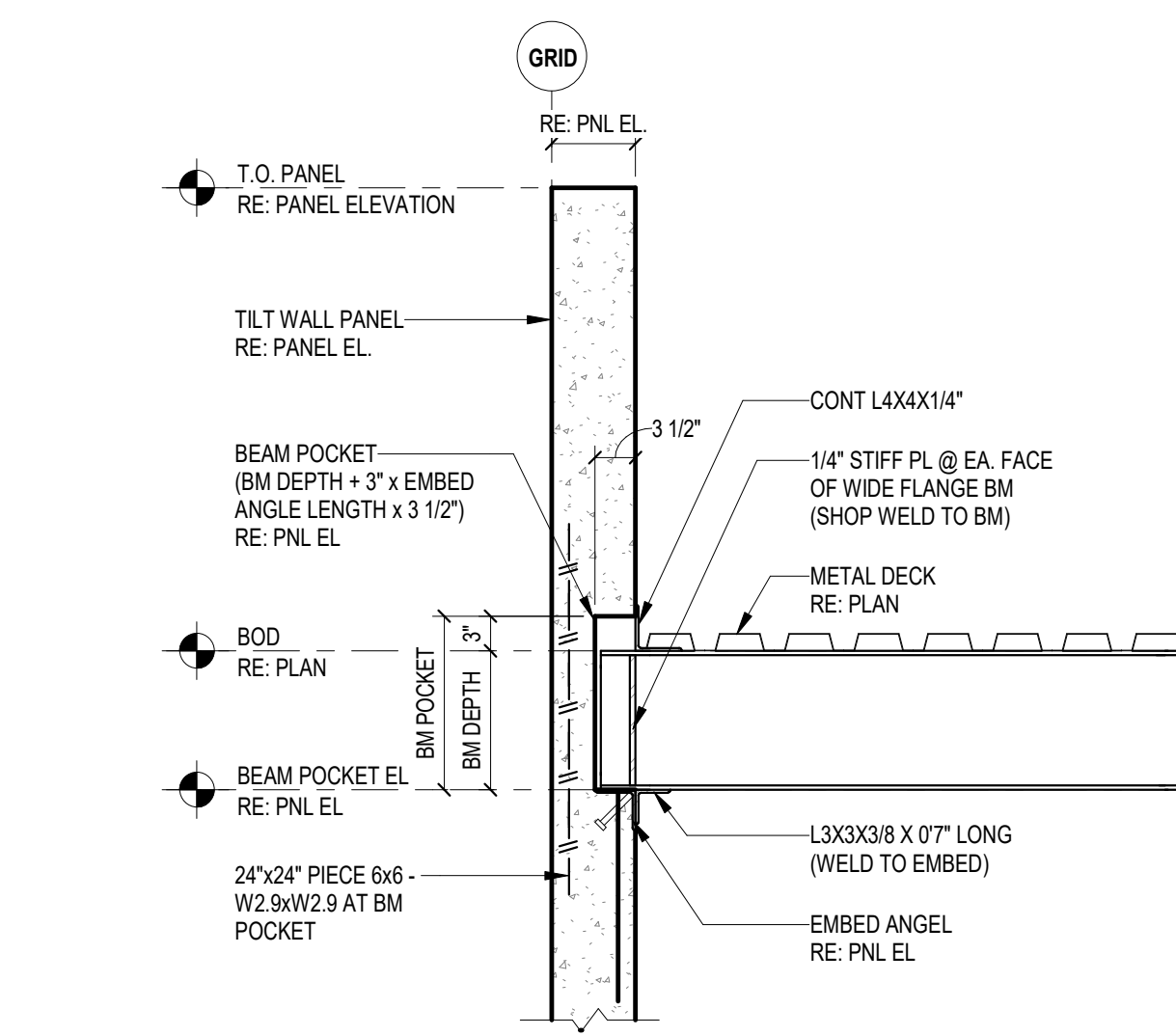
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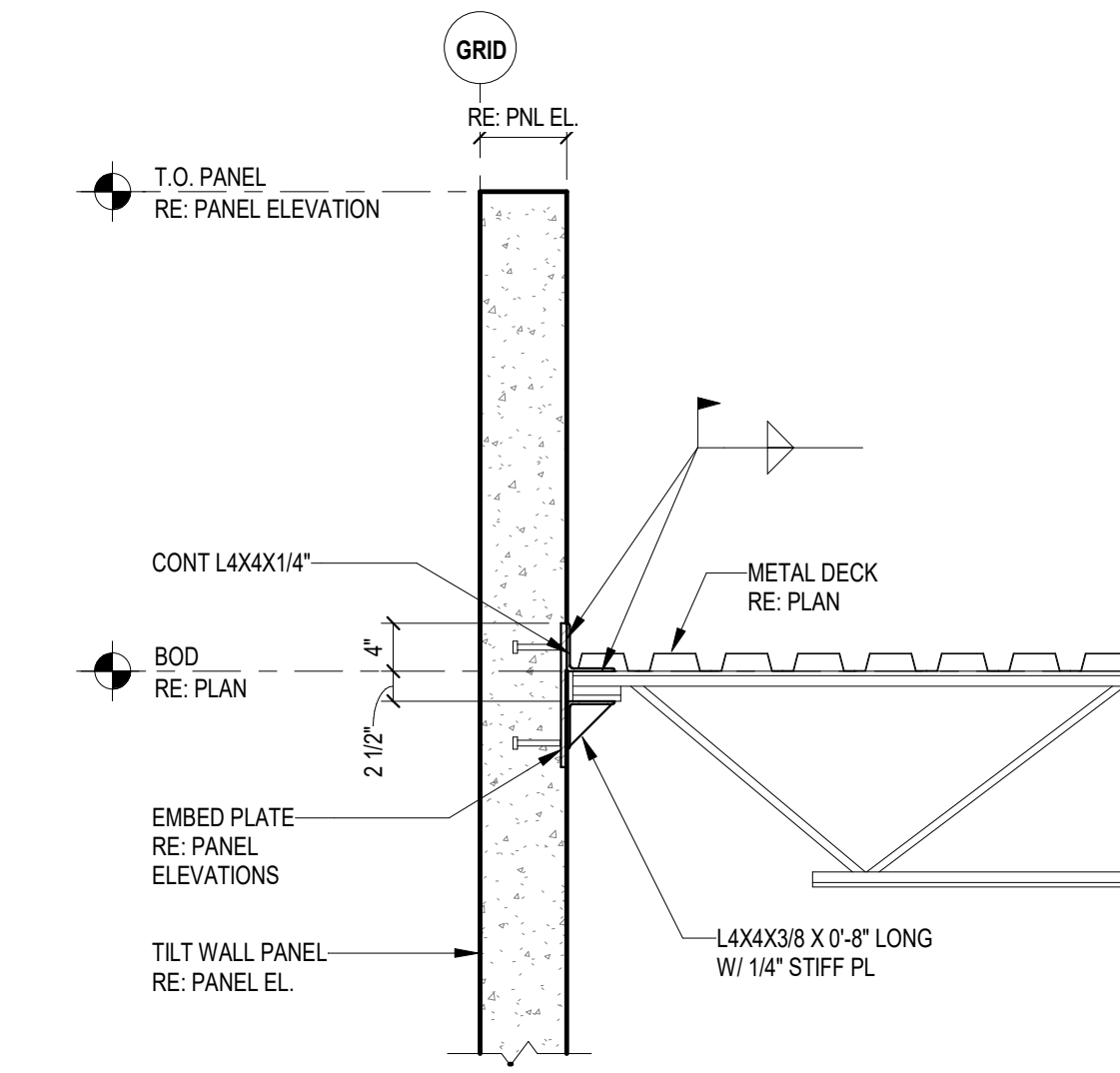
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3/4" = 1'-0"



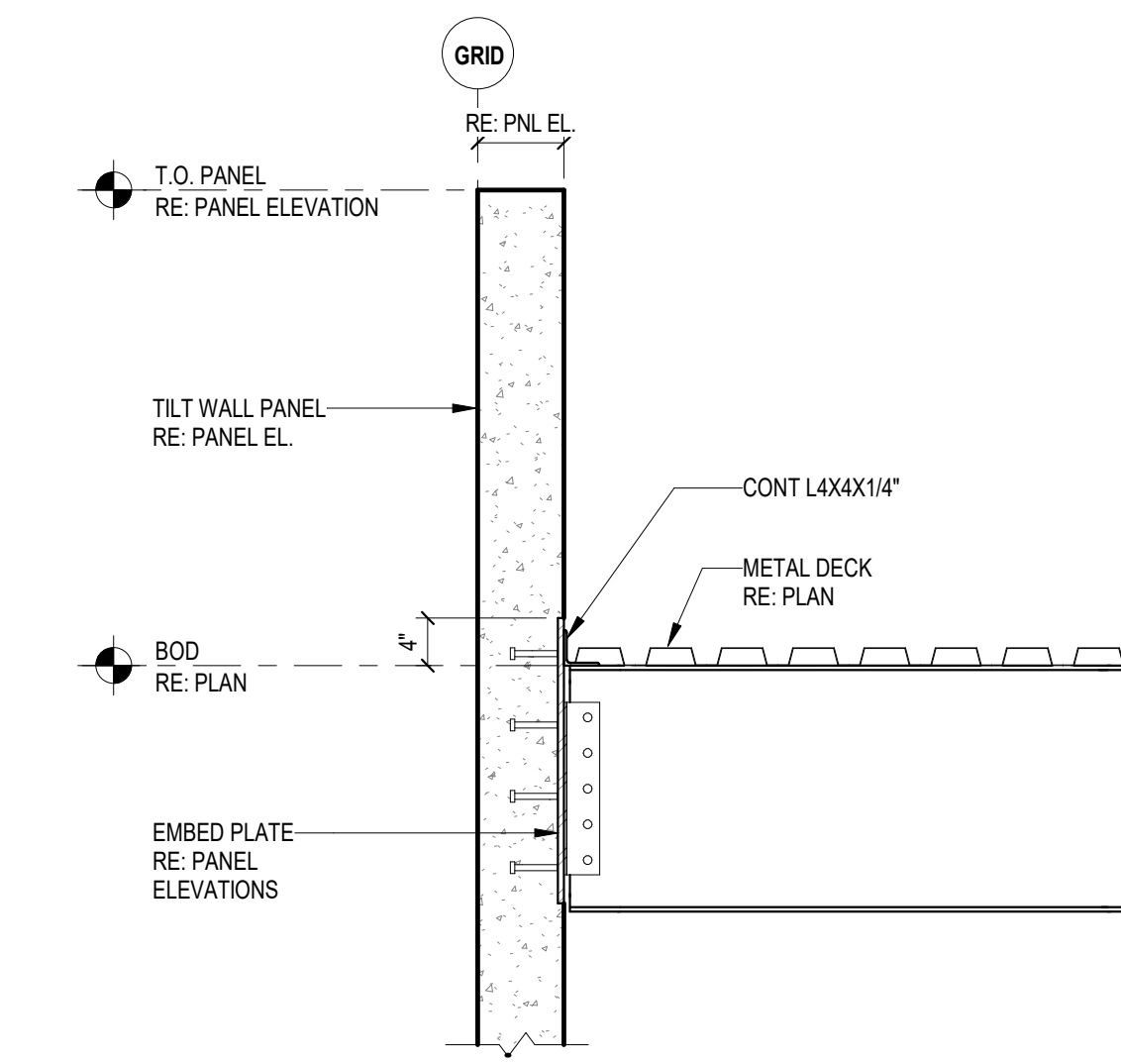
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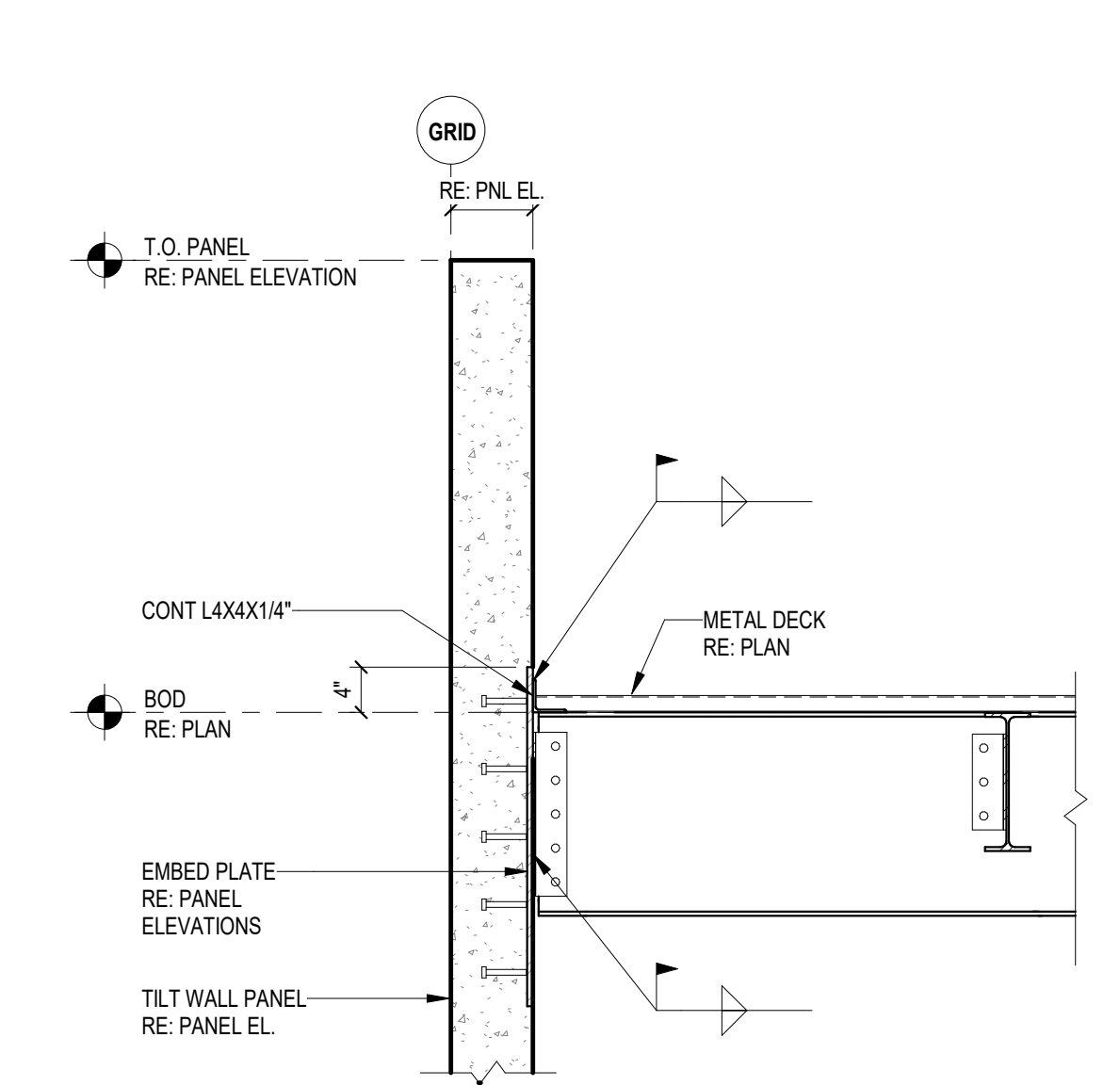
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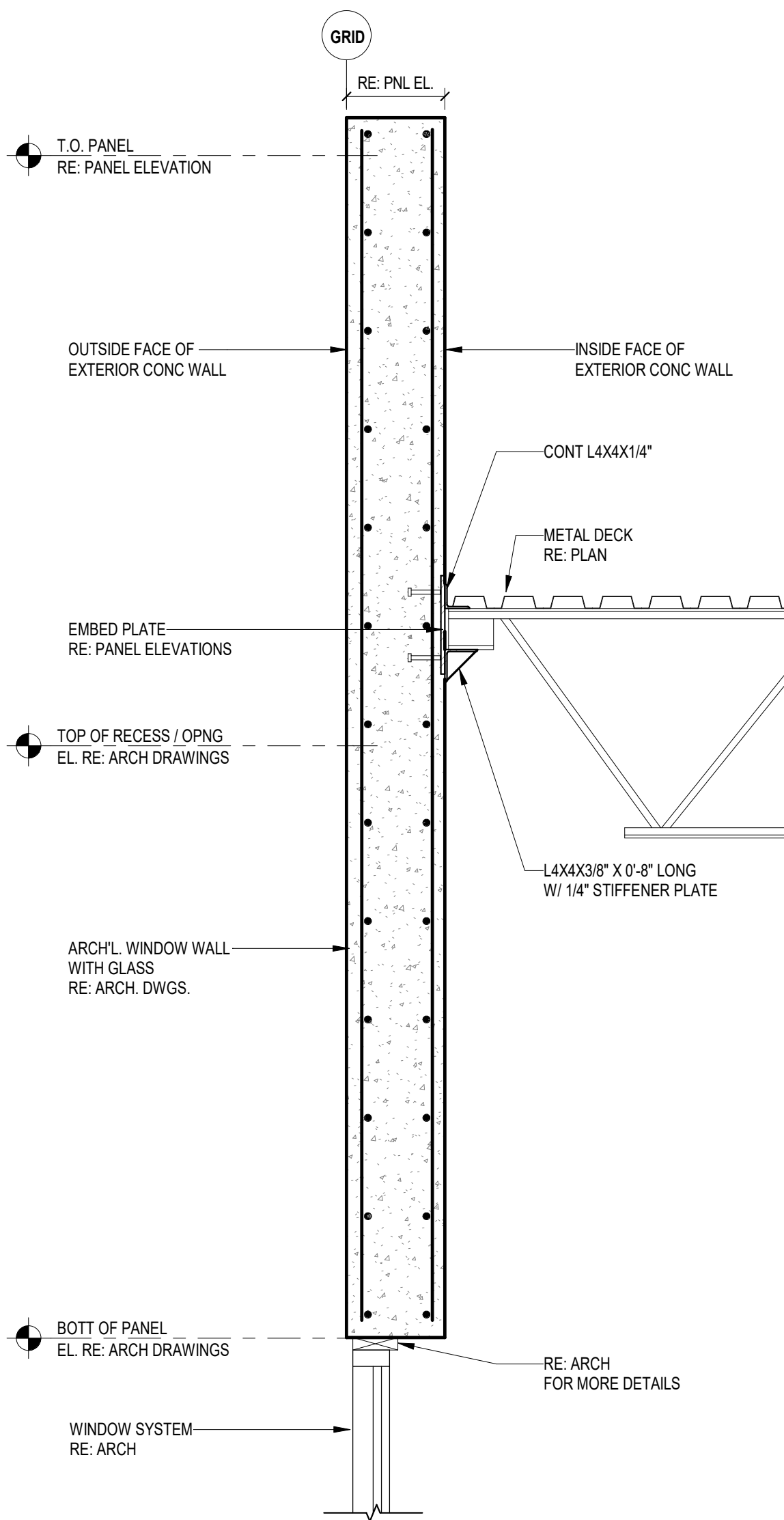
**4 SECTION**  
3/4" = 1'-0"



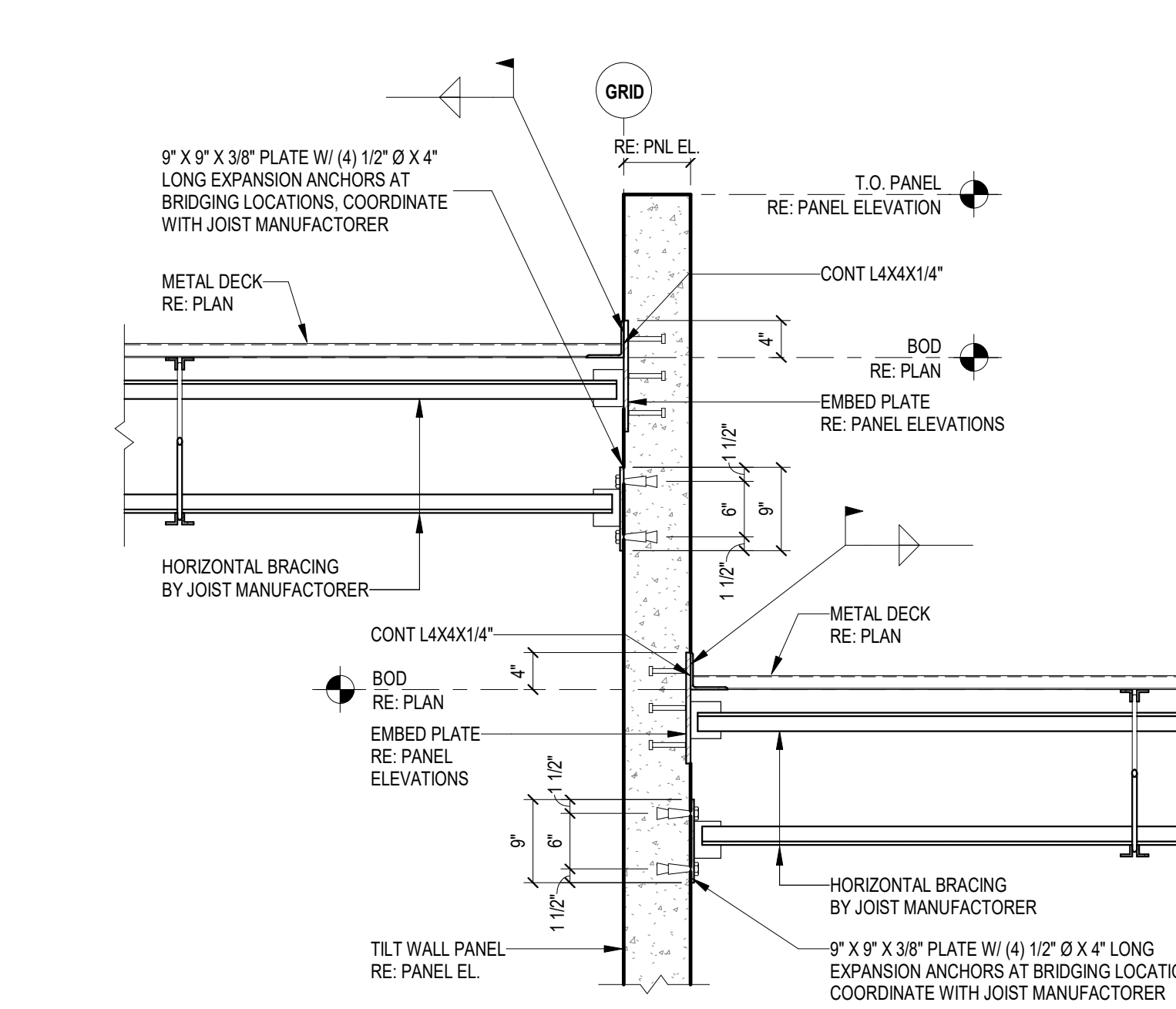
**5 SECTION**  
3/4" = 1'-0"



**6 SECTION**  
3/4" = 1'-0"



**7 SECTION AT WINDOW**  
3/4" = 1'-0"



**8 SECTION**  
3/4" = 1'-0"



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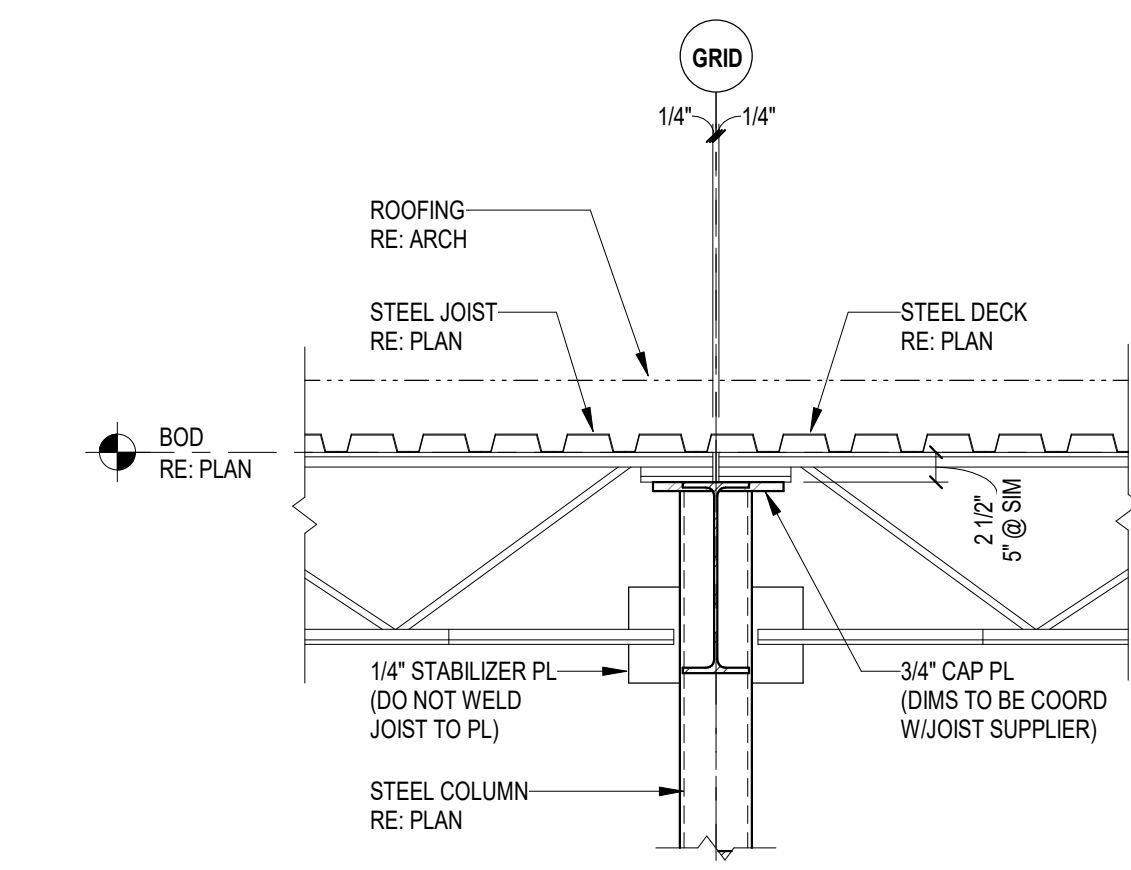
No.	Description	Date

**ROOF FRAMING  
DETAILS**

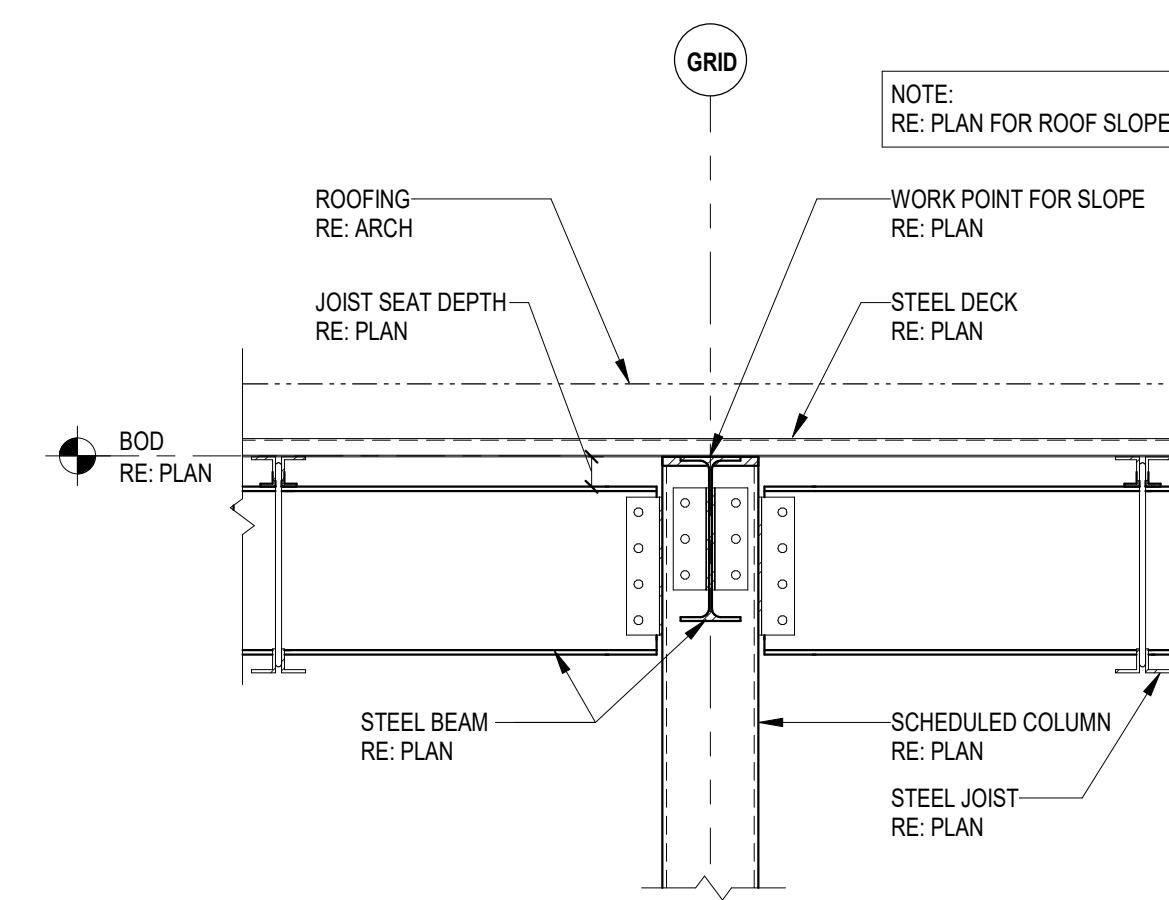
**Dally**  
+ ASSOCIATES  
STRUCTURAL & CIVIL

9800 Richmond Avenue, Suite 460  
Houston, Texas 77042  
713.337.8881  
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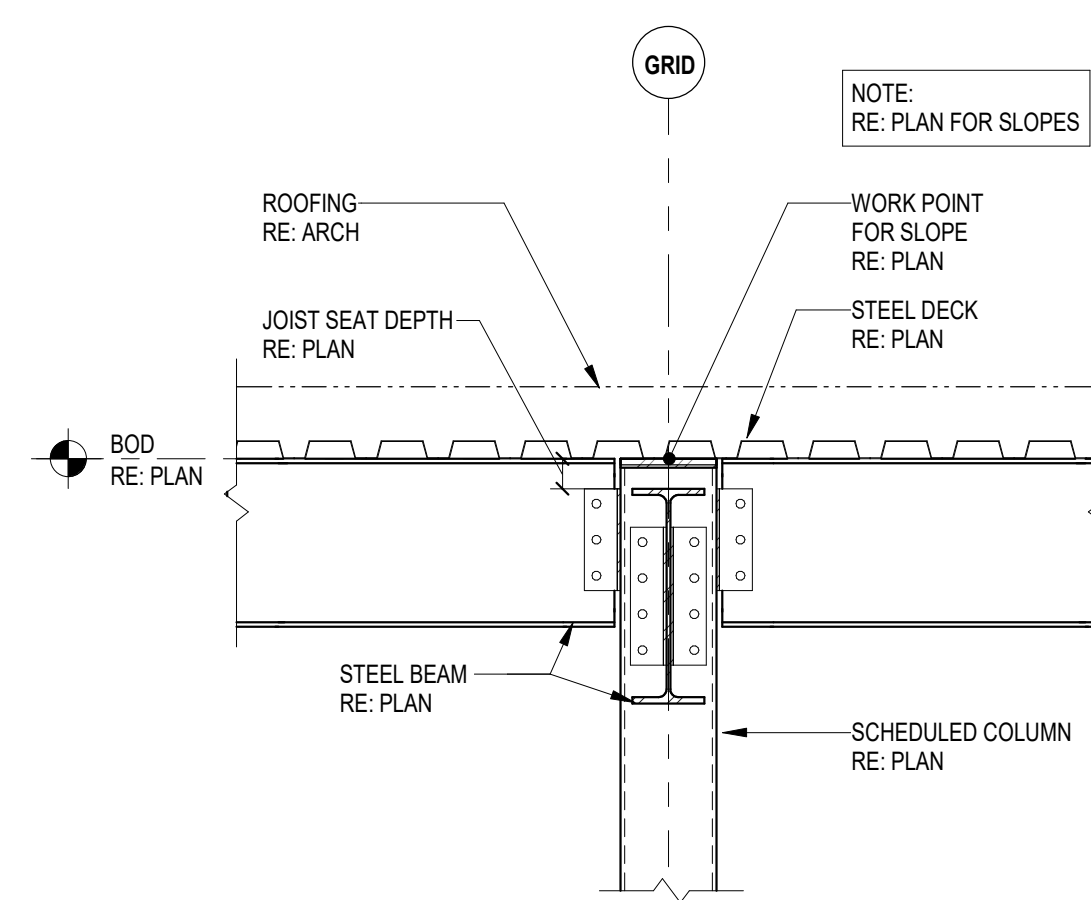
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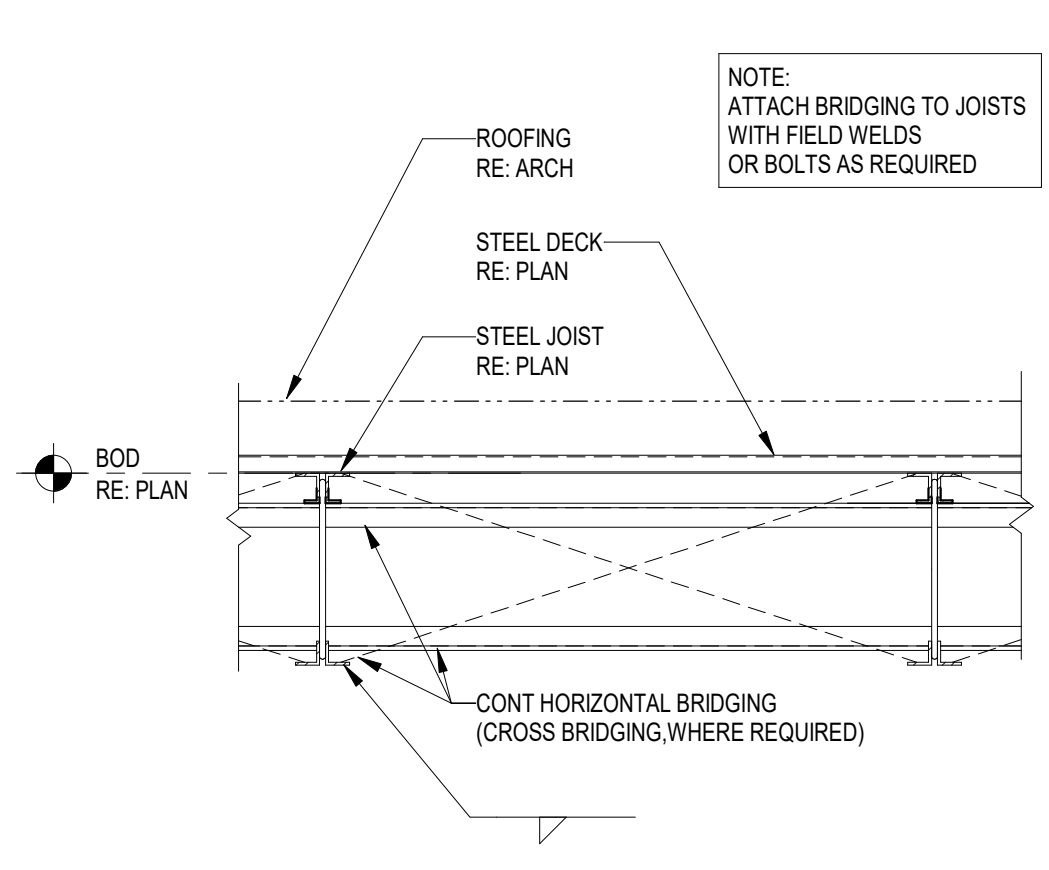
**5** TYPICAL ROOF SECTION  
3/4" = 1'-0"



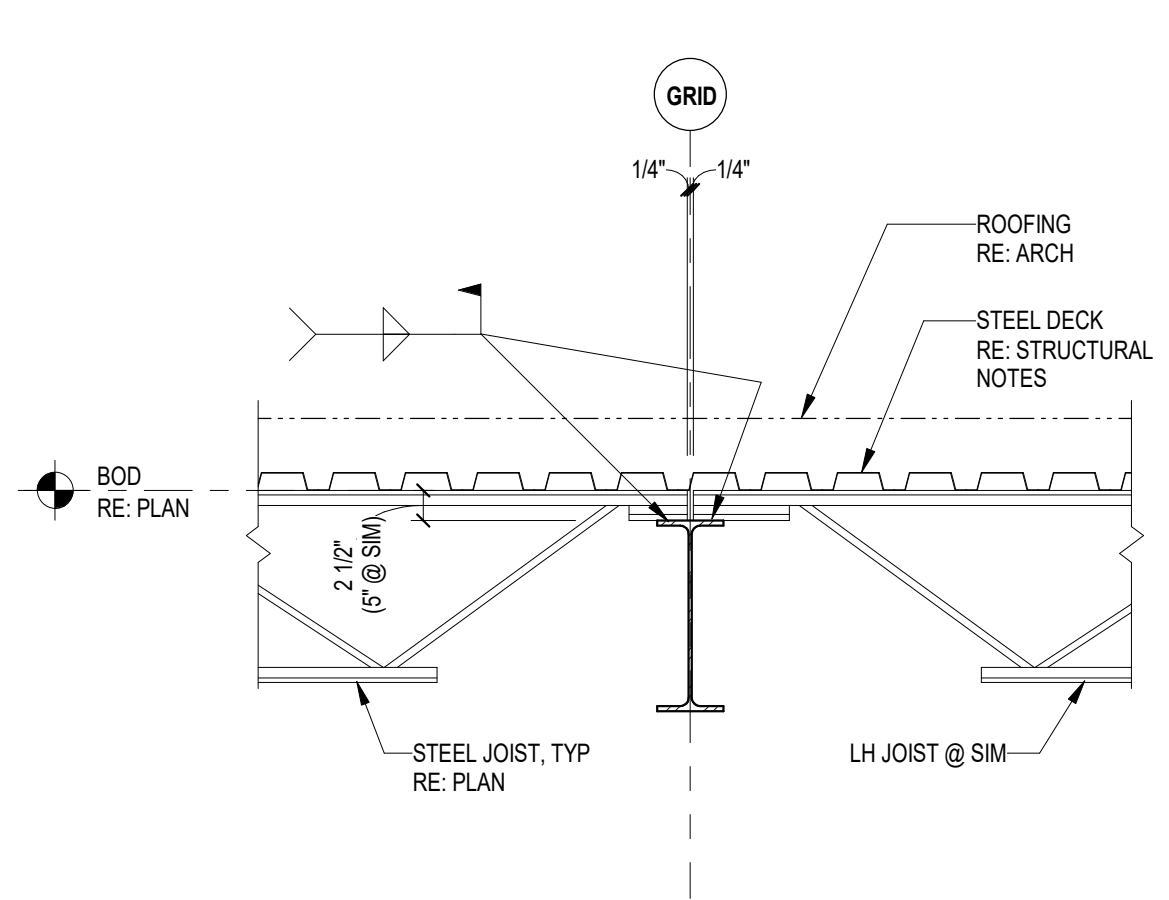
**4** TYPICAL ROOF SECTION  
3/4" = 1'-0"



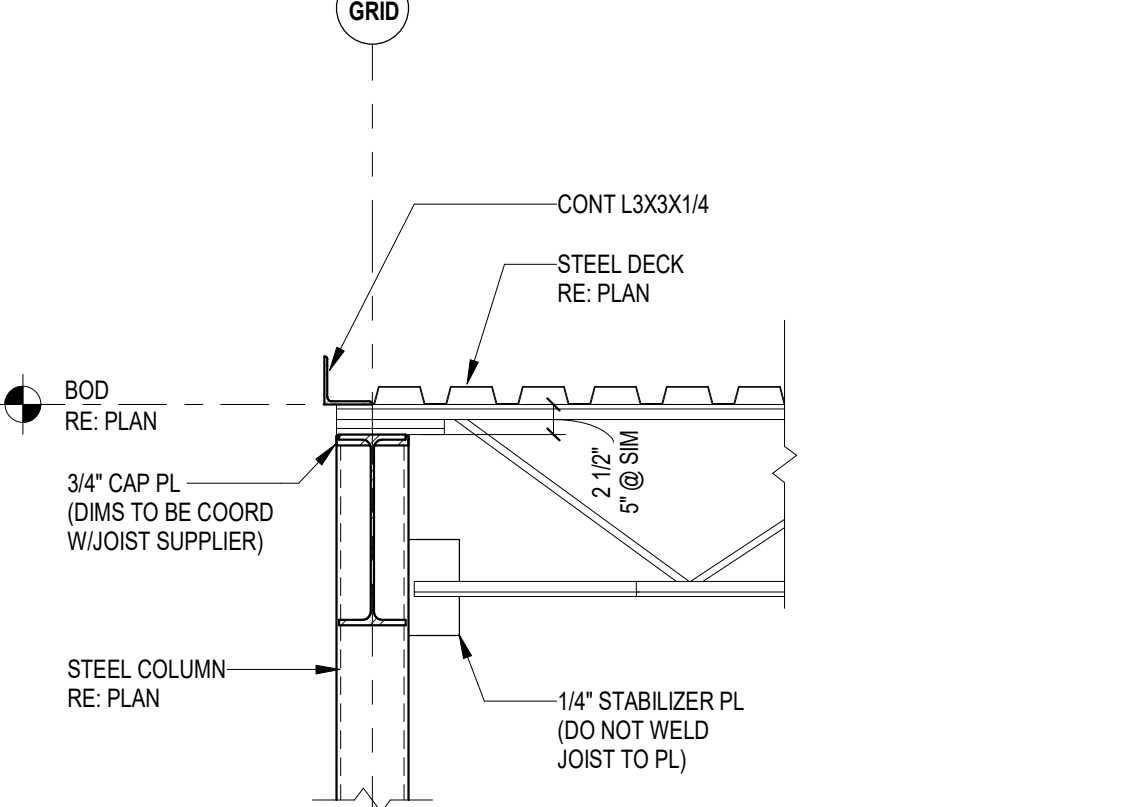
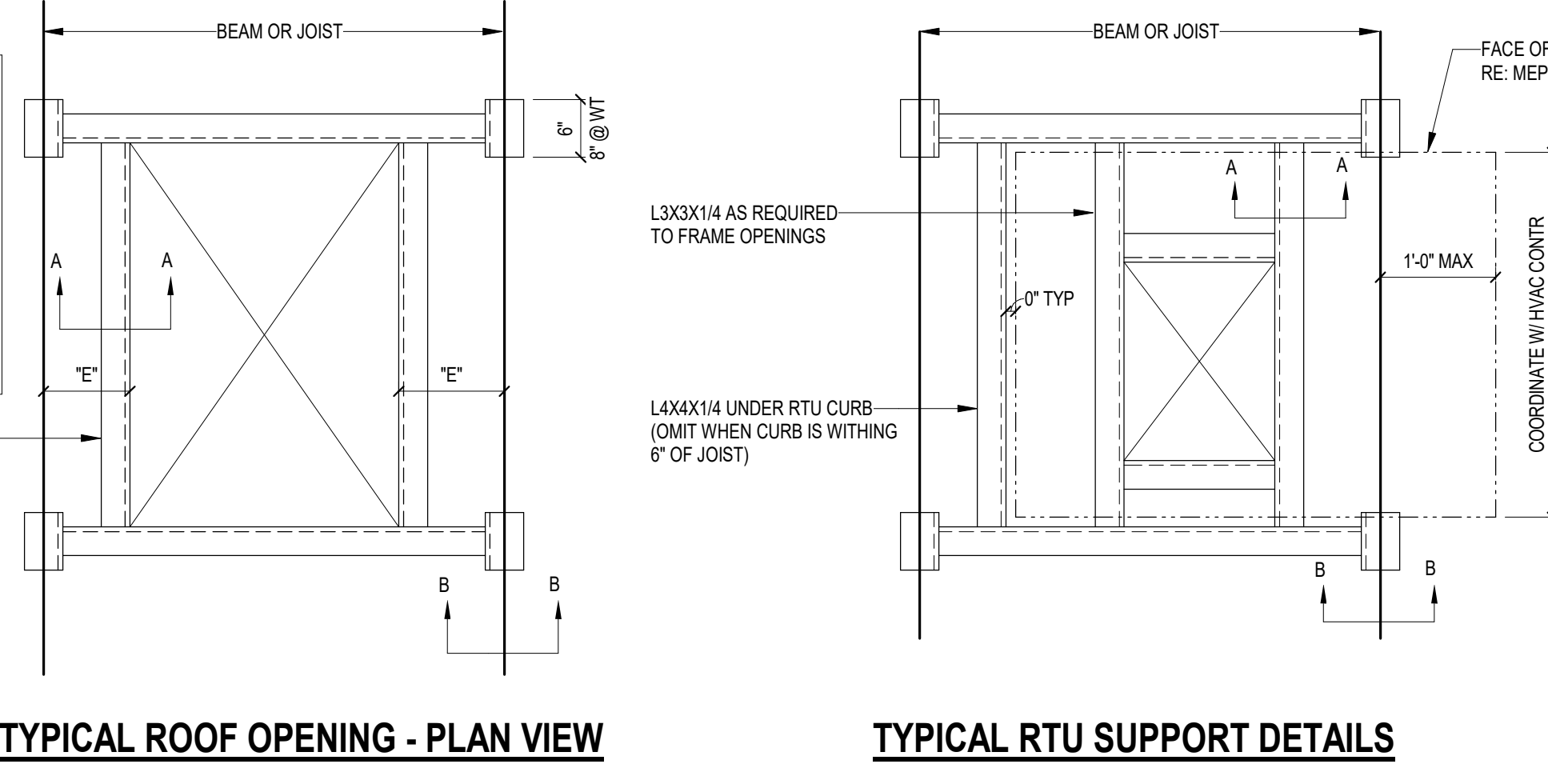
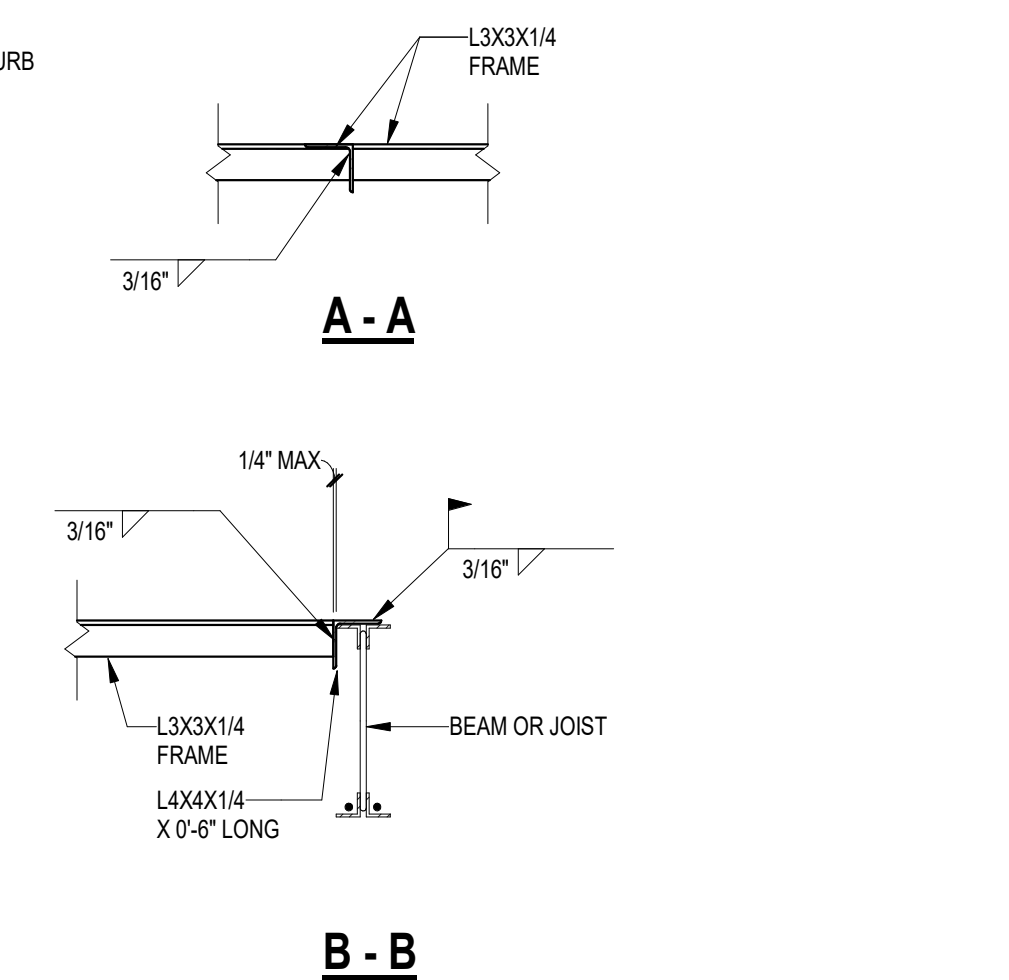
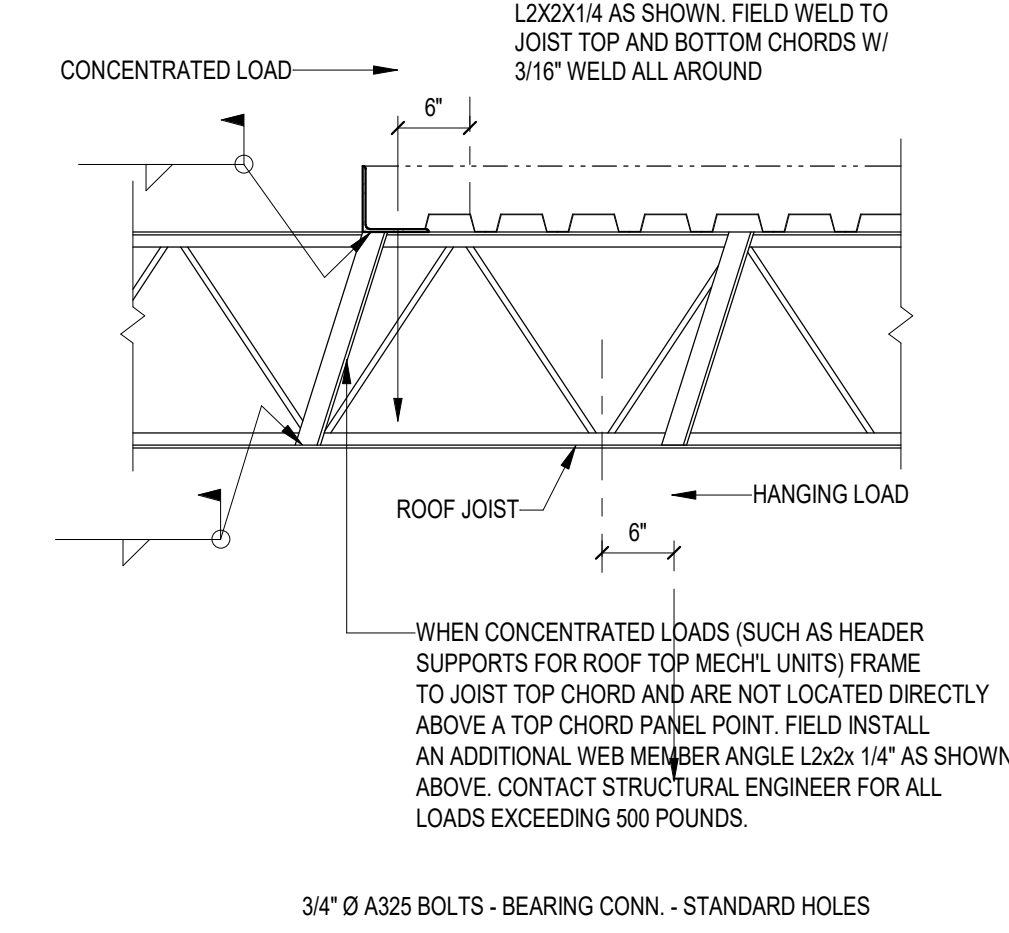
**3** TYPICAL ROOF SECTION  
3/4" = 1'-0"



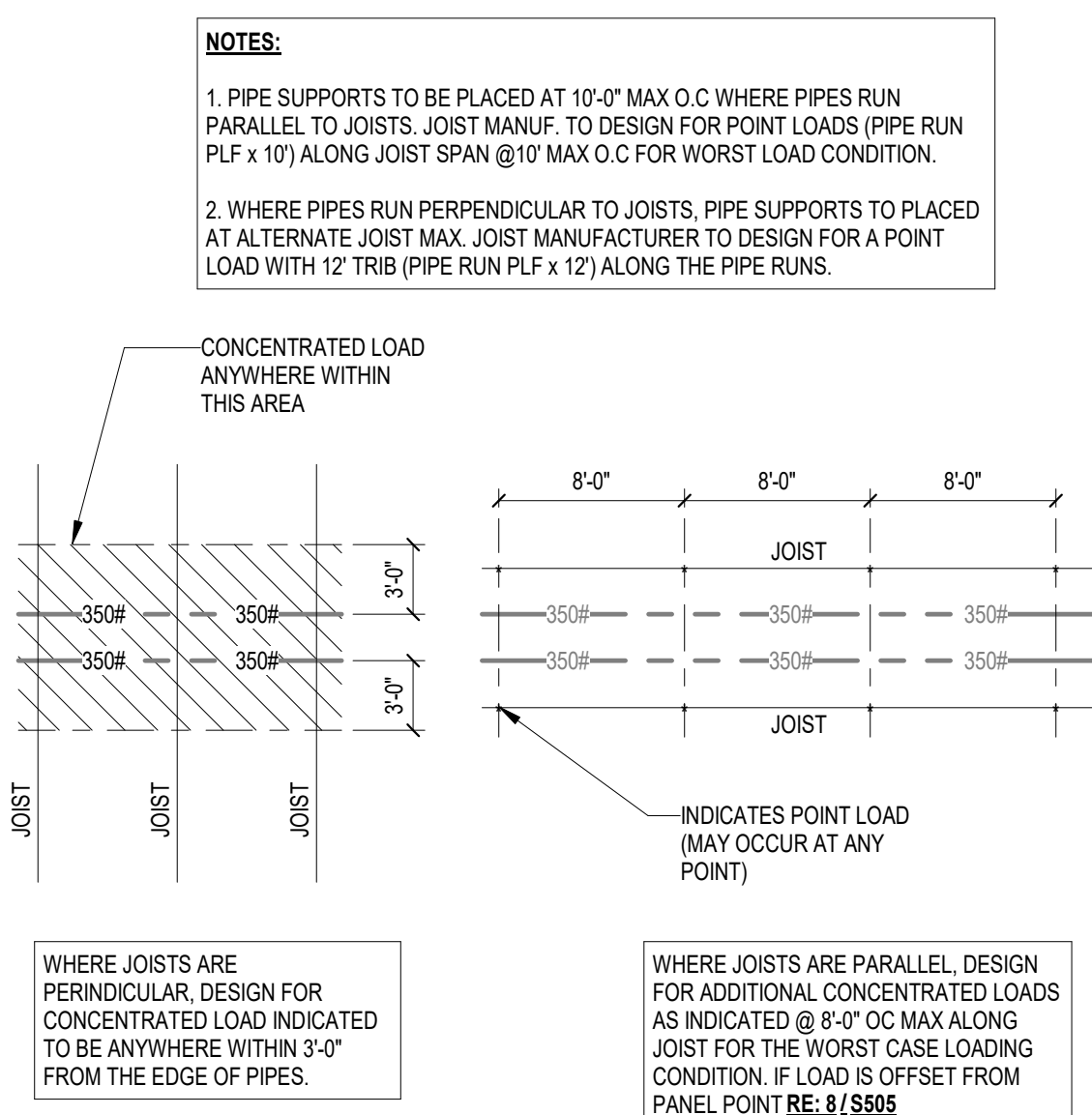
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3/4" = 1'-0"



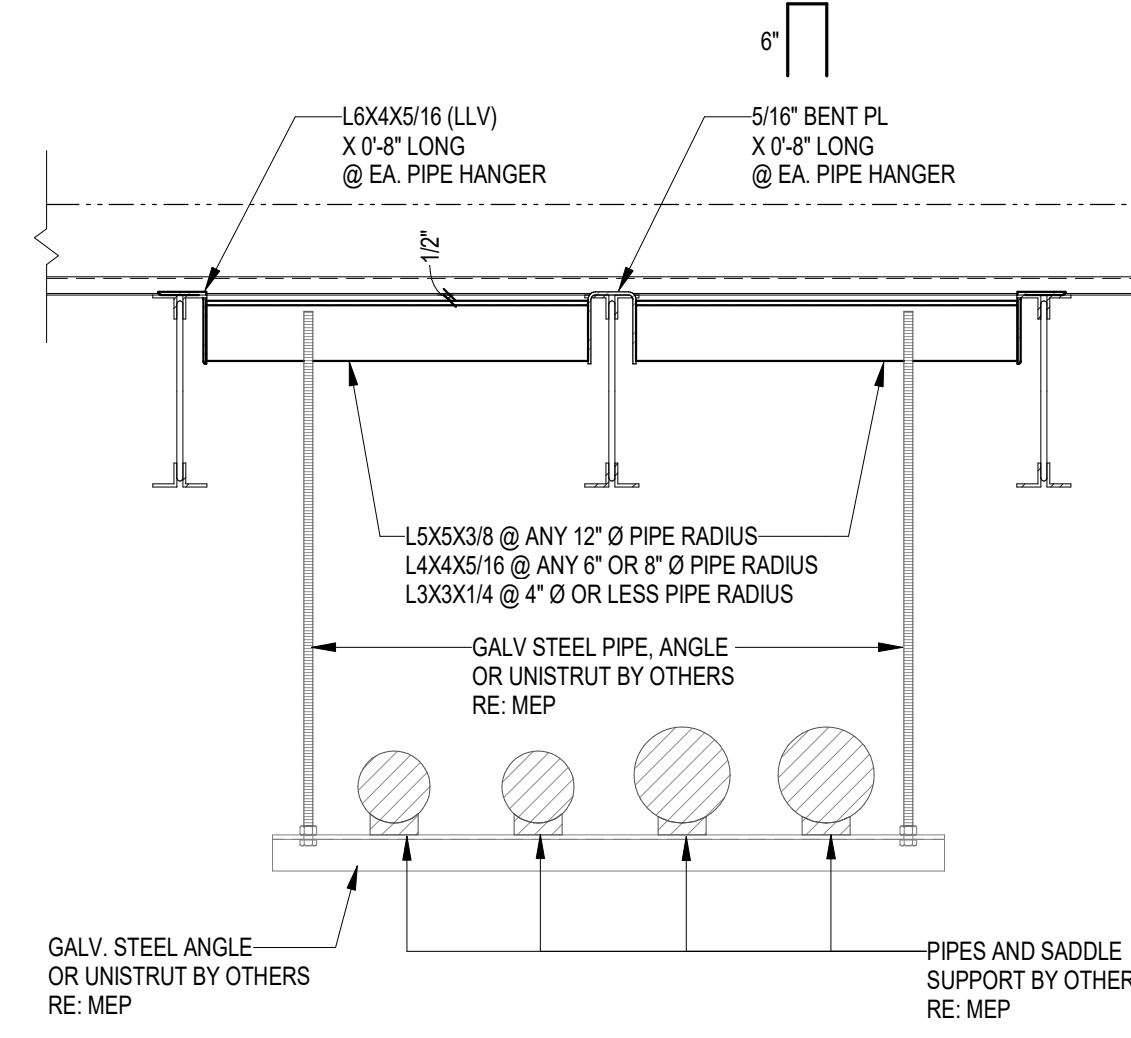
**1** TYPICAL ROOF SECTION  
3/4" = 1'-0"



**8** LOAD OFFSET FROM JOIST PNL POINT  
3/4" = 1'-0"

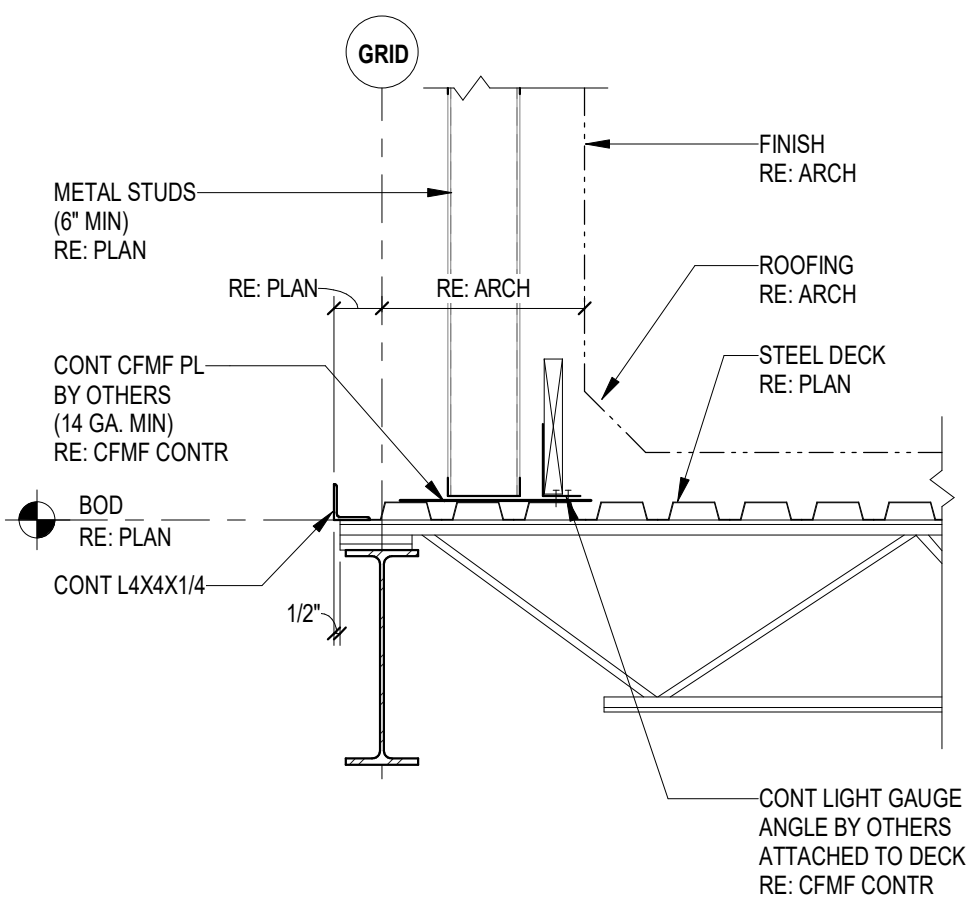


**12** TYPICAL PIPE LOADING DIAGRAM  
1/8" = 1'-0"

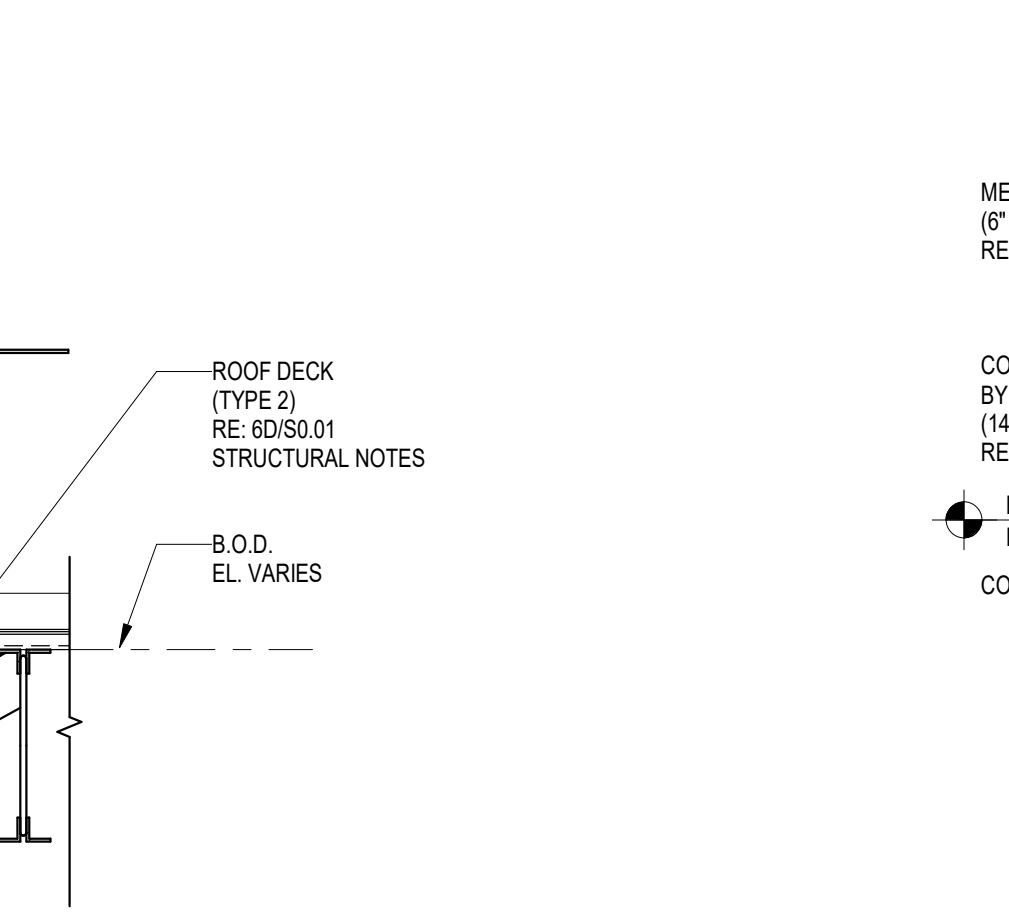


**13** TYPICAL PIPE HANGER DETAIL  
3/4" = 1'-0"

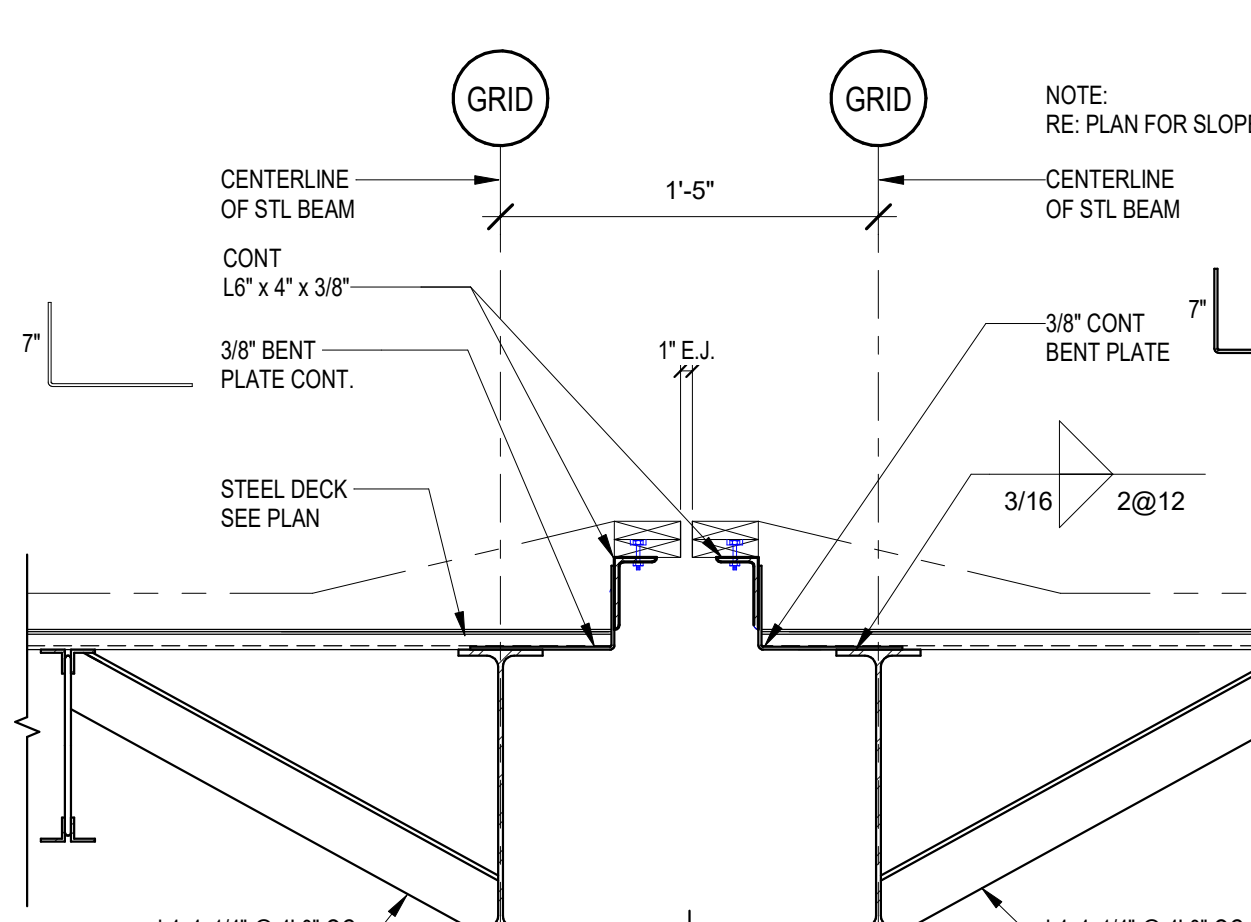
**11** TYPICAL HSS POST CONN.  
3/4" = 1'-0"



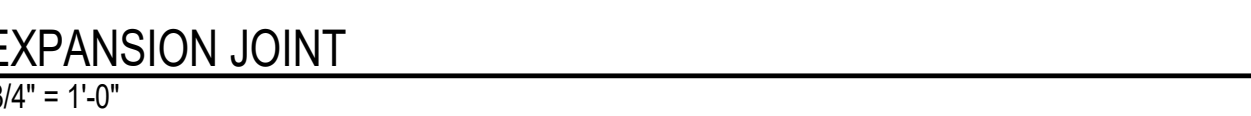
**10** TYPICAL ROOF SECTION  
3/4" = 1'-0"



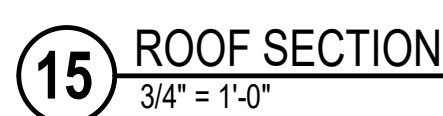
**9** TYPICAL ROOF SECTION  
3/4" = 1'-0"



**14** EXPANSION JOINT  
3/4" = 1'-0"



**15** ROOF SECTION  
3/4" = 1'-0"



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FBC Elections Administration Building

3700 BAYMORE RD.  
ROSENBERG, TX 77471  
100% CONSTRUCTION DOCUMENTS

Project No.: 2330

Drawing Date: 01/17/2024  
Drawn: MR  
Checked: SJ  
Scale: AS NOTED

No.	Description	Date
1	100%CD	01.17.2024

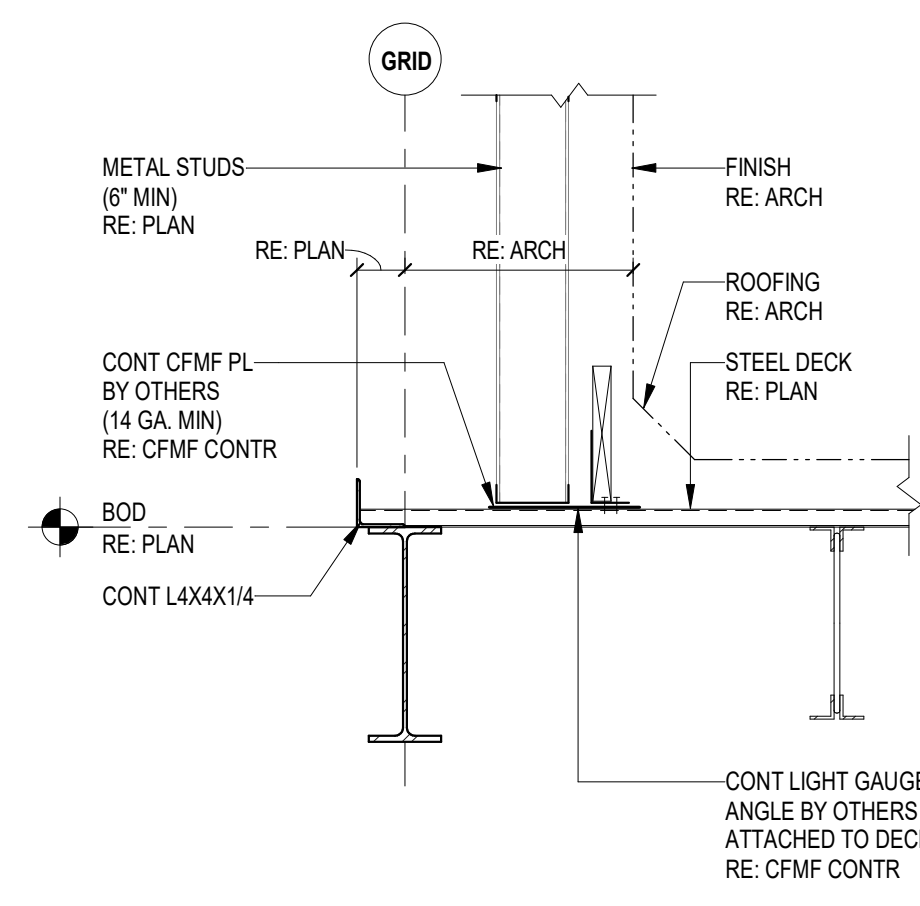
No.	Description	Date

ROOF FRAMING  
DETAILS

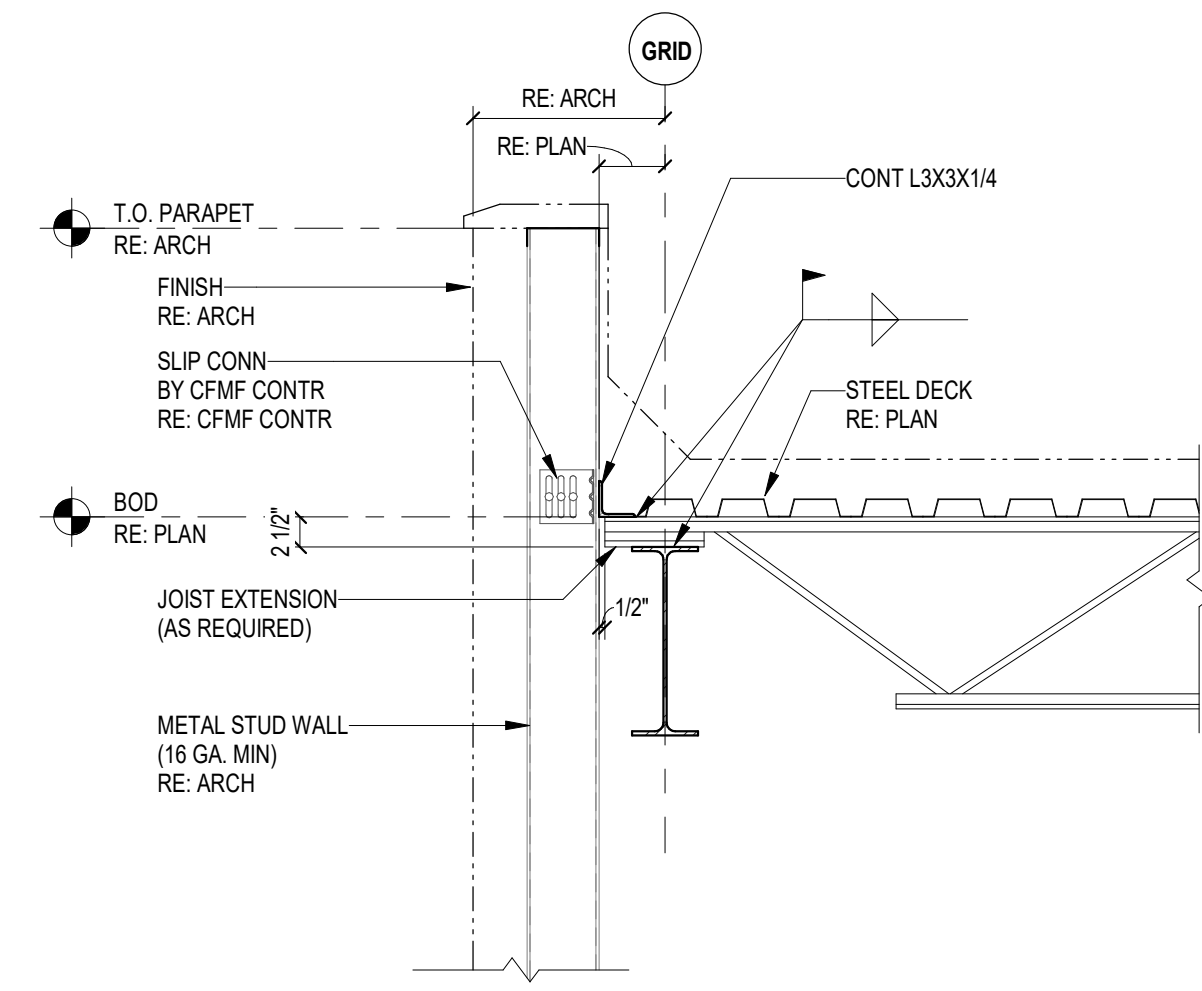
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**Dally**  
+ ASSOCIATES

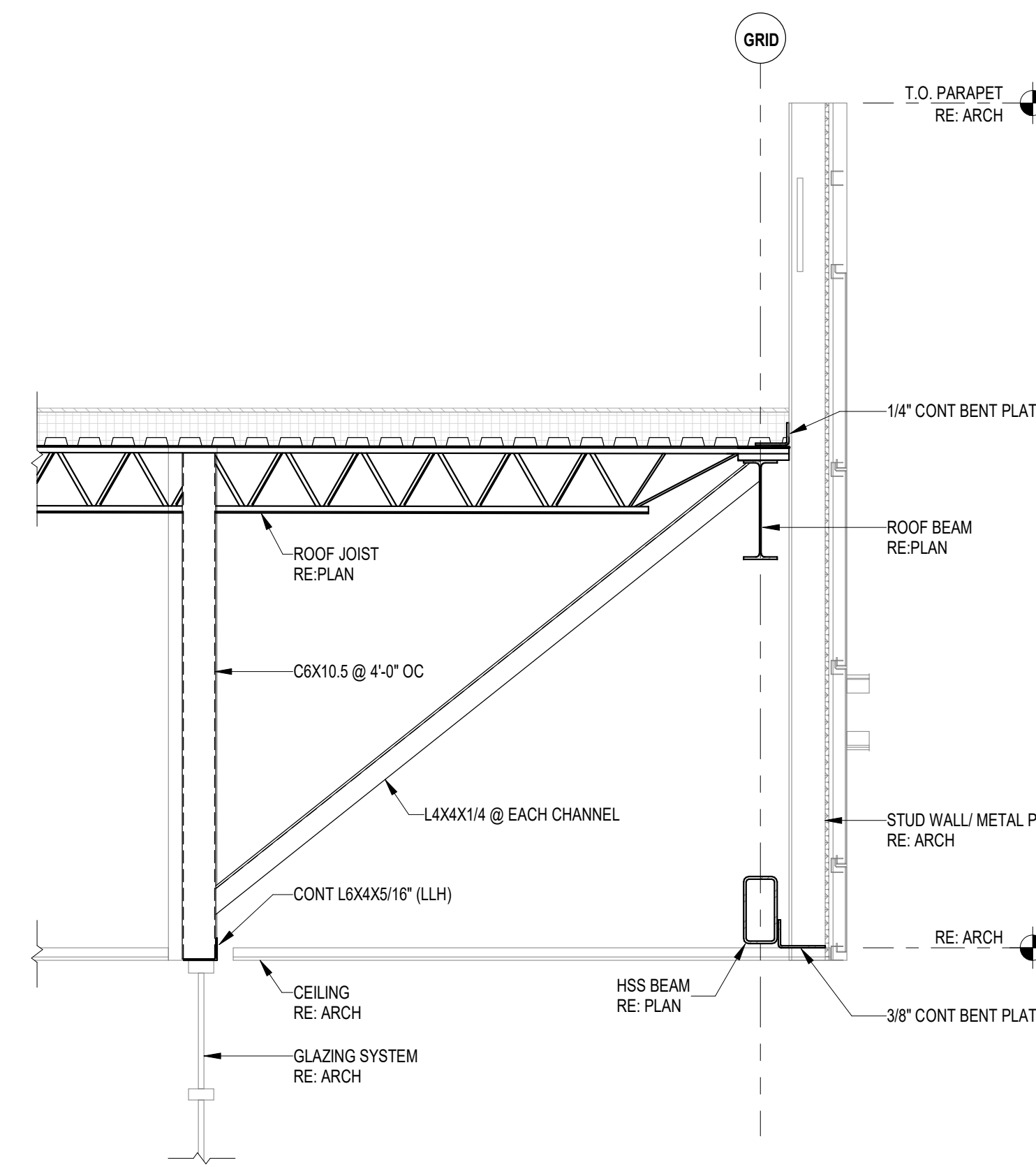
STRUCTURAL | CIVIL  
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1 713 337 8881  
Texas Registered Engineering Firm  
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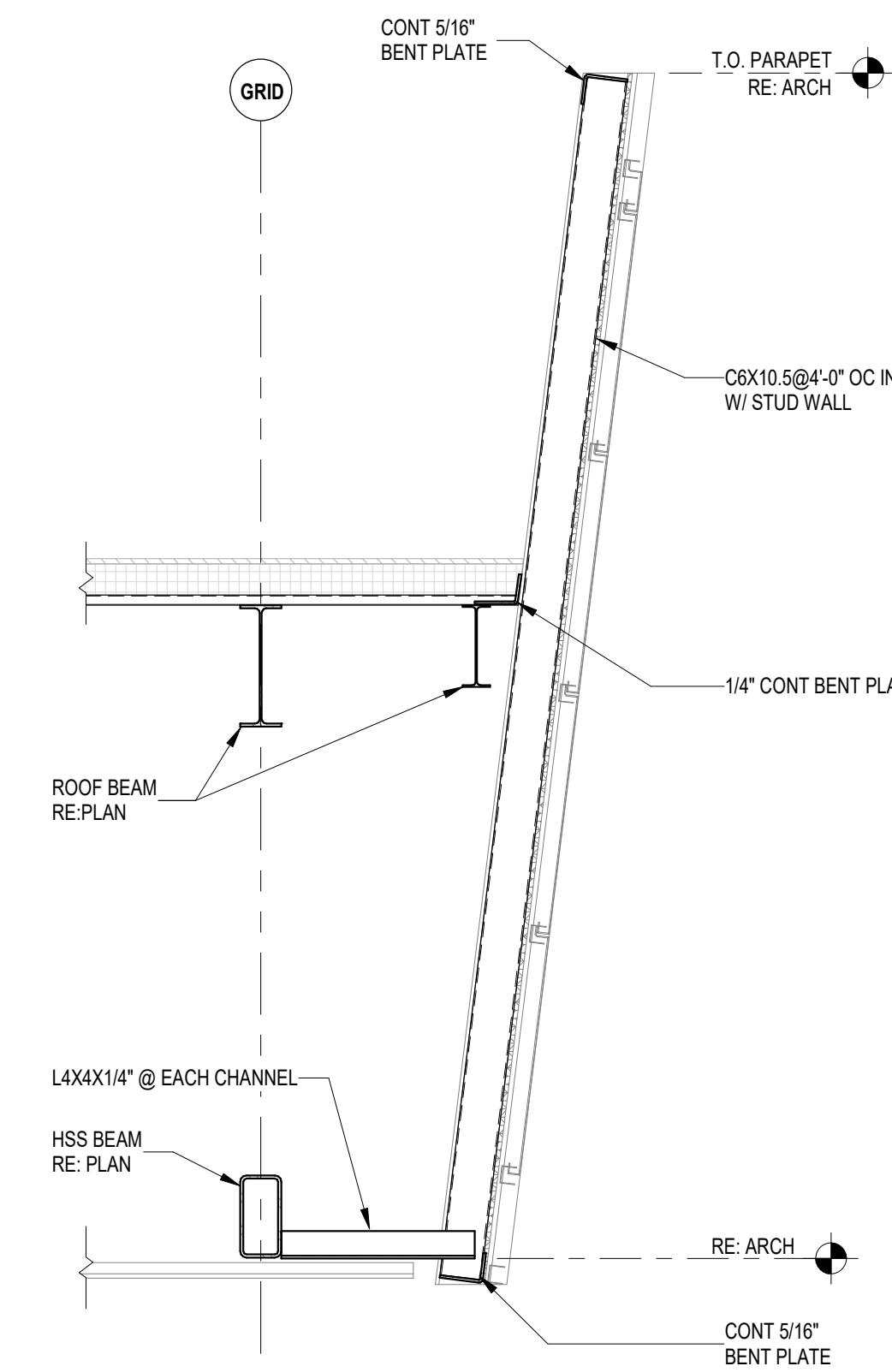
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3/4" = 1'-0"



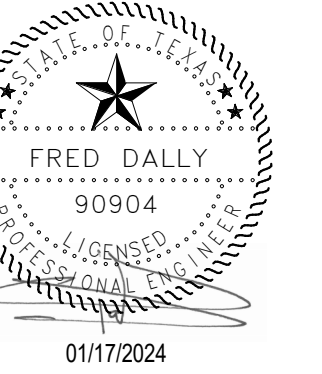
2 SECTION  
3/4" = 1'-0"



3 ROOF SECTION  
1/2" = 1'-0"



4 ROOF SECTION  
1/2" = 1'-0"



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100% CONSTRUCTION DOCUMENTS

Project No.: 2330

Drawing Date: 01/17/2024  
Drawn: MR  
Checked: SJ  
Scale: AS NOTED

Issue Log:

No.	Description	Date
1	100%CD	01.17.2024

Revisions:

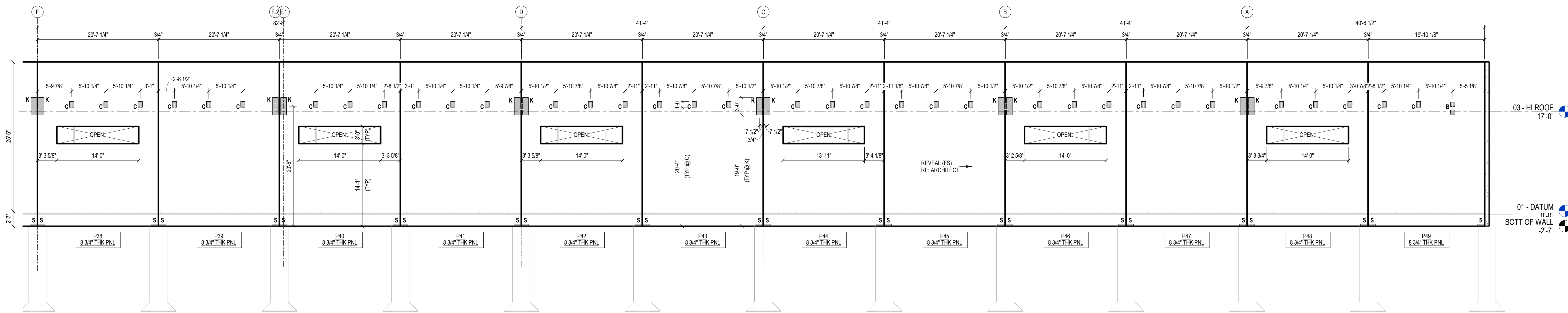
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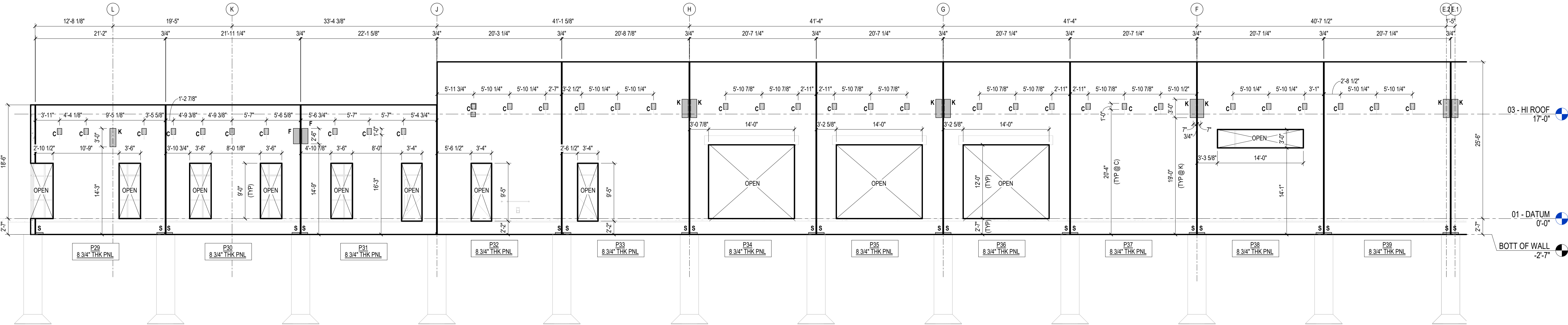


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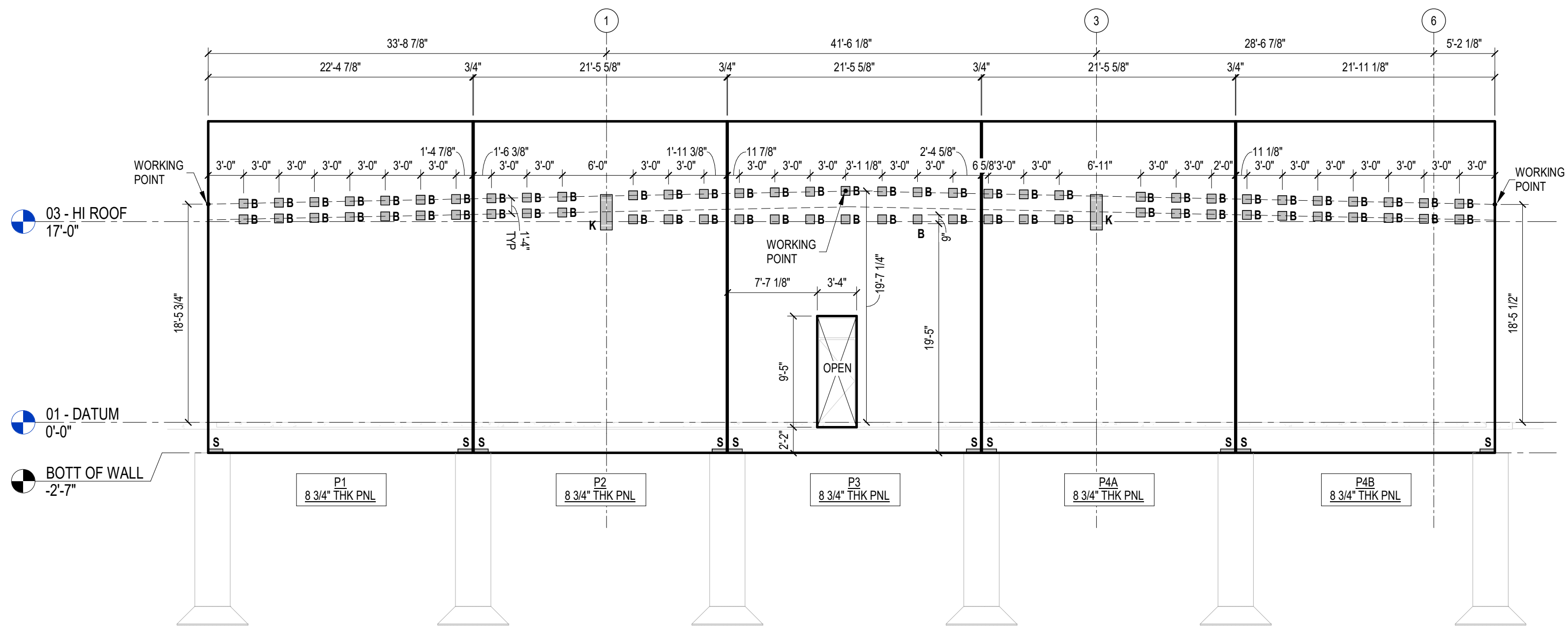
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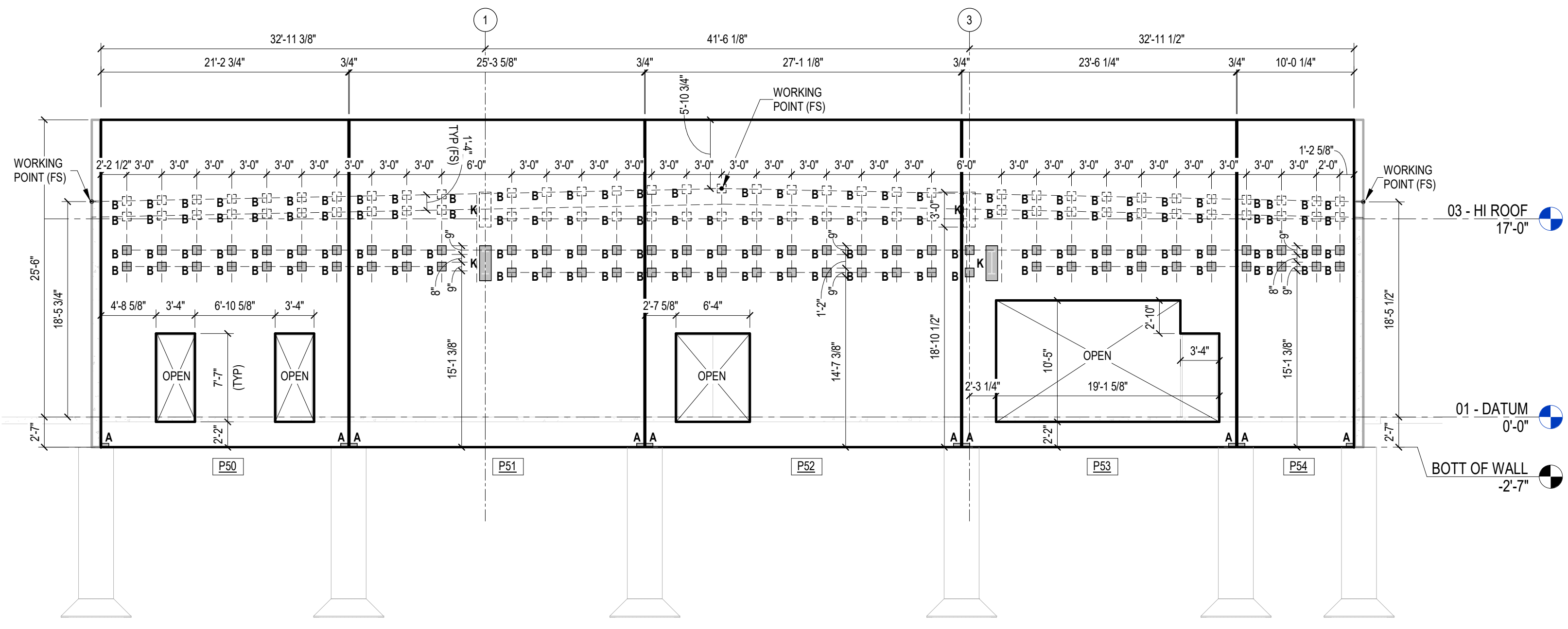
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2 WALL ELEVATION  
1/8" = 1'-0"

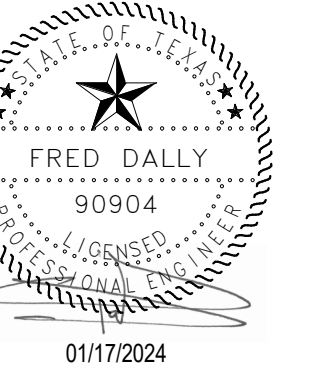


3 WALL ELEVATION  
1/8" = 1'-0"



4 WALL ELEVATION  
1/8" = 1'-0"

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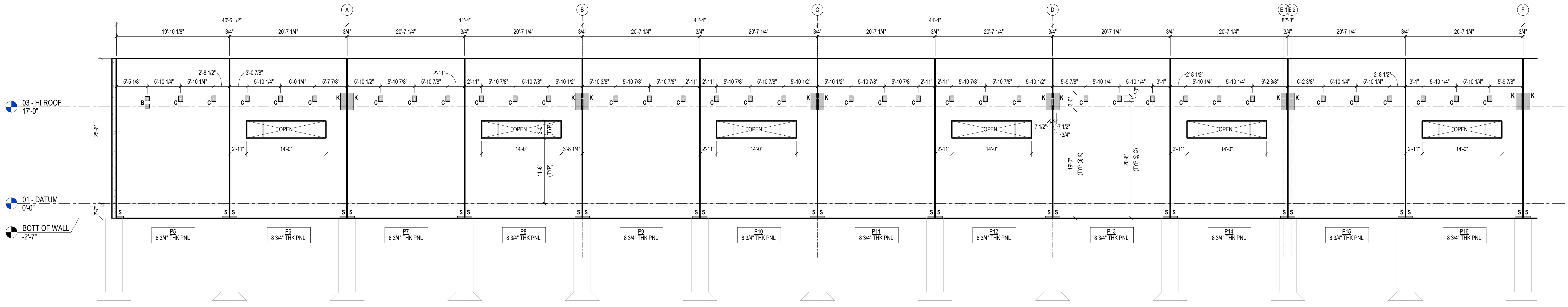
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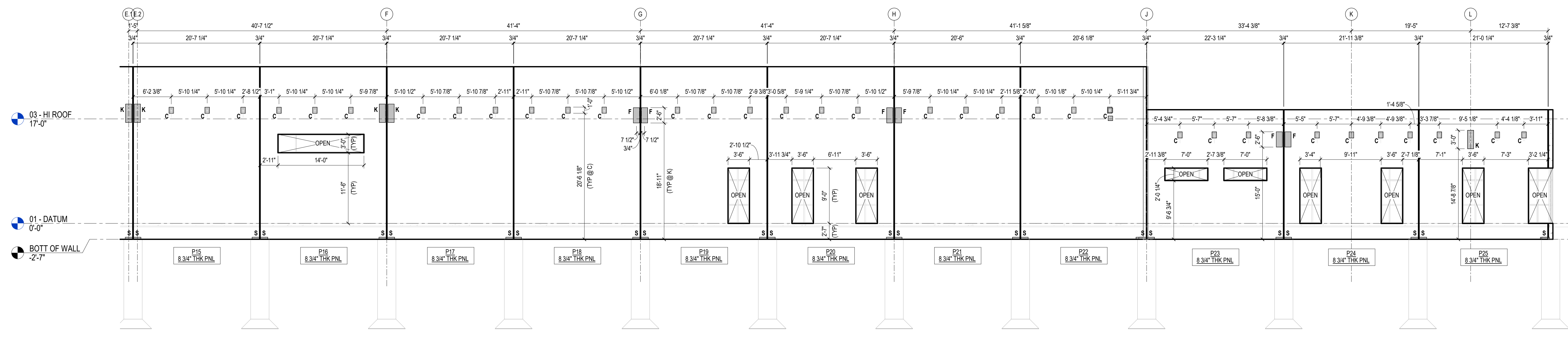
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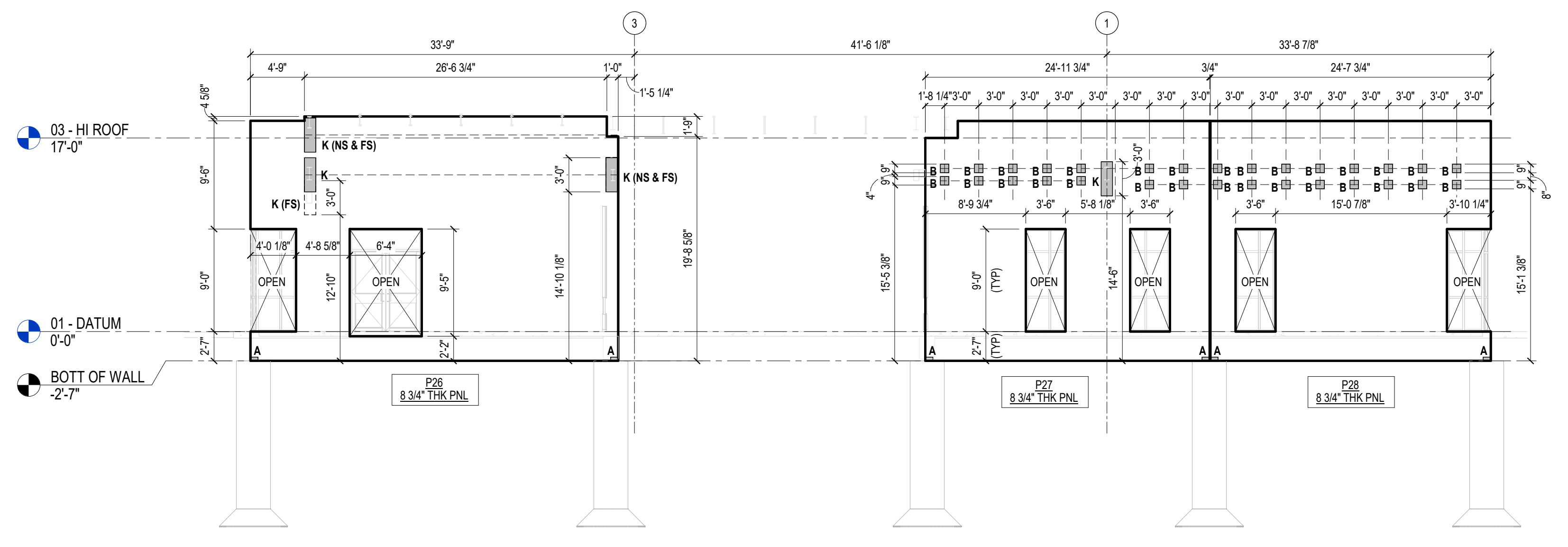
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ROSENBERG, TX 77471  
100% CONSTRUCTION DOCUMENTS



1 WALL ELEVATION  
1/8" = 1'-0"



2 WALL ELEVATION  
1/8" = 1'-0"



3 WALL ELEVATION  
1/8" = 1'-0"

Project No.: 2330

Drawing Date: 01/17/2024  
Drawn: MR  
Checked: SI  
Scale: AS NOTED

Issue Log:

No.	Description	Date
1	100%CD	01.17.2024

Revisions:

No.	Description	Date



GENERAL ARCH SITE PLAN NOTES

1. REFER TO CIVIL DOCUMENTS  
 2. CONFORM TO ALL CITY ORDINANCES AND REGULATIONS SPECIFICALLY, LANDSCAPE AND SITE STRUCTURAL DOCUMENTS  
 3. PROVIDE AND MAINTAIN POSITIVE DRAINAGE AWAY FROM ALL BUILDINGS OF 1/8" FOR A MINIMUM DISTANCE OF 10 FEET AT ALL EXTERIOR NON-PAVED AREAS, INCLUDING BUT NOT LIMITED TO DRIVEWAYS, PATIO, STAIRWAYS, ETC.  
 4. PROVIDE AND MAINTAIN POSITIVE DRAINAGE AWAY FROM ALL BUILDINGS OF 1/8" FOR A MINIMUM DISTANCE OF 10 FEET AT ALL EXTERIOR NON-PAVED AREAS, INCLUDING BUT NOT LIMITED TO DRIVEWAYS, PATIO, STAIRWAYS, ETC.  
 5. VERIFY ALL UTILITIES AND CONDUITS ARE DEEPER THAN THE PROPOSED FOUNDATION AND EXISTING FOUNDATION FOOTINGS.  
 6. VERIFY AND CORRECT ALL CONDUIT LOCATIONS AT ALL CONCRETE BEAMS AND WALLS PRIOR TO POURING OF CONCRETE.  
 7. PROVIDE AND MAINTAIN CONCRETE BEAMS AND EXISTING CONDUIT LOCATIONS AT ALL CONCRETE BEAMS AND WALLS PRIOR TO POURING OF CONCRETE.  
 8. PROVIDE AND MAINTAIN CONCRETE BEAMS AND EXISTING CONDUIT LOCATIONS AT ALL CONCRETE BEAMS AND WALLS PRIOR TO POURING OF CONCRETE.  
 9. VERIFY ALL SITE DRAINAGE CONDITIONS WITHIN 100 FEET TO THE BOUNDARY OF THE SITE.

SITE PLAN - KEY NOTES

- 01 CONCRETE PAVING RE. CIVIL DRAWINGS
- 02 CONCRETE SIDEWALK RE. CIVIL DRAWINGS
- 03 IF CONCRETE CURBS RE. CIVIL DRAWINGS DETAILS
- 04 STRENGTH AND YELLOW PAINT
- 05 SITE LAYOUT/SCALE SITE DIMENSIONS
- 06 CURBSTOP
- 07 GENERATOR PAD
- 08 FIRE HOSE CAB
- 09 POWER POLE
- 10 WALLS
- 11 FLAG POLES



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A B

KEY PLAN

Project No.: 2330

Drawing Date: 12/07/23  
 Drawn: YG  
 Checked: DM  
 Scale: AS NOTED

Issue Log:

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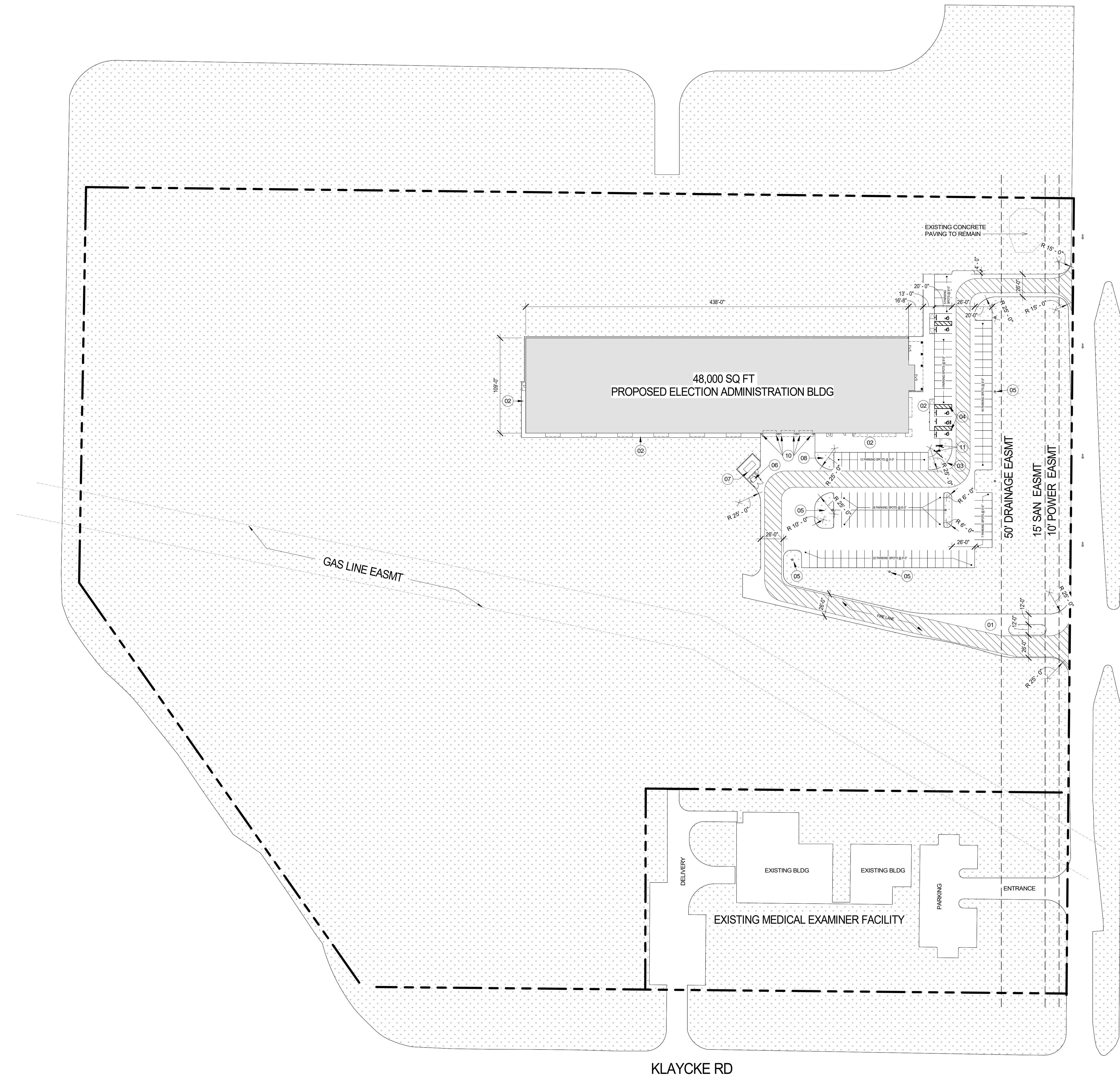
  

Revisions:

No.	Description	Date

ARCHITECTURAL SITE PLAN

A0.01



Autodesk Docs/2330 FBC Elections Admin Facility revit 2023/24\_0105 FBC Election admin.rvt  
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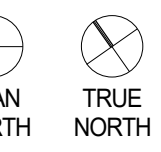
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FOR BID AND PERMIT

A B

KEY PLAN



Project No.: 2330

Drawing Date: 01.17.2024  
Drawn: YG  
Checked: DM  
Scale: AS NOTED

Issue Log:

No.	Description	Date

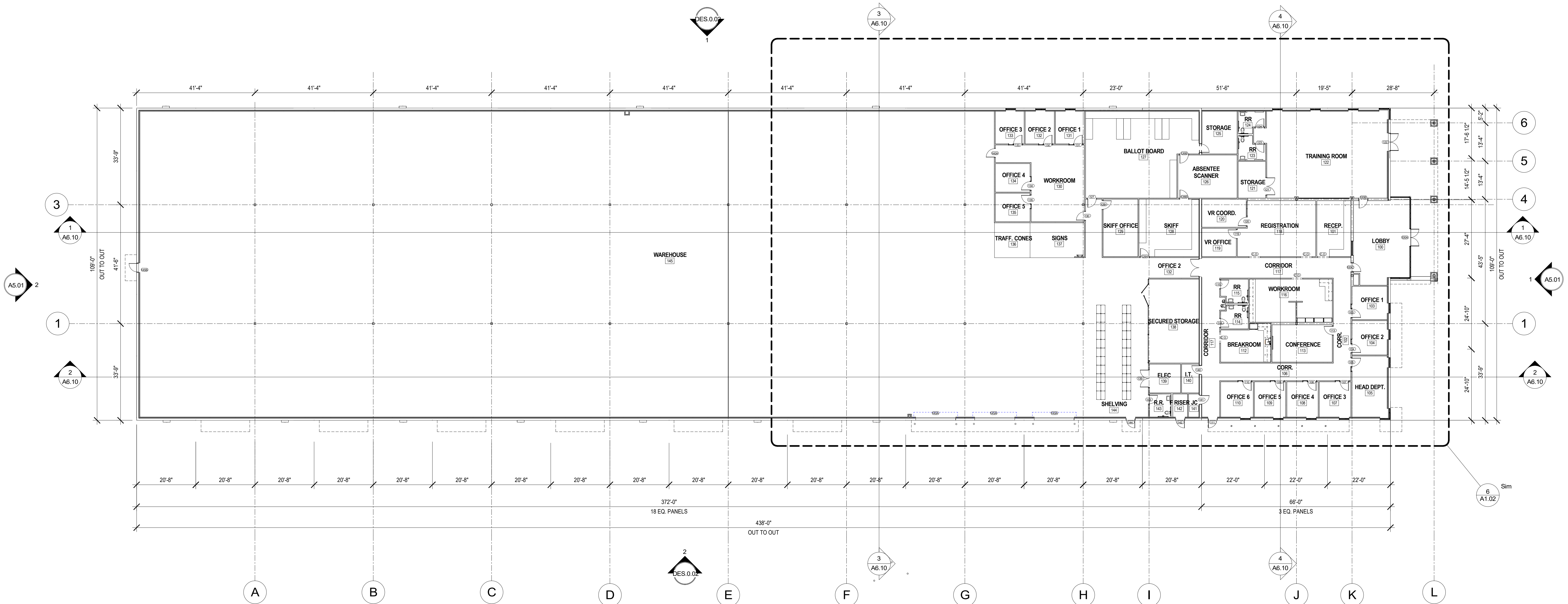
Revisions:

No.	Description	Date

OVERALL FLOOR  
PLAN

A1.01

1 OVERALL FLOOR PLAN  
1/16" = 1'-0"

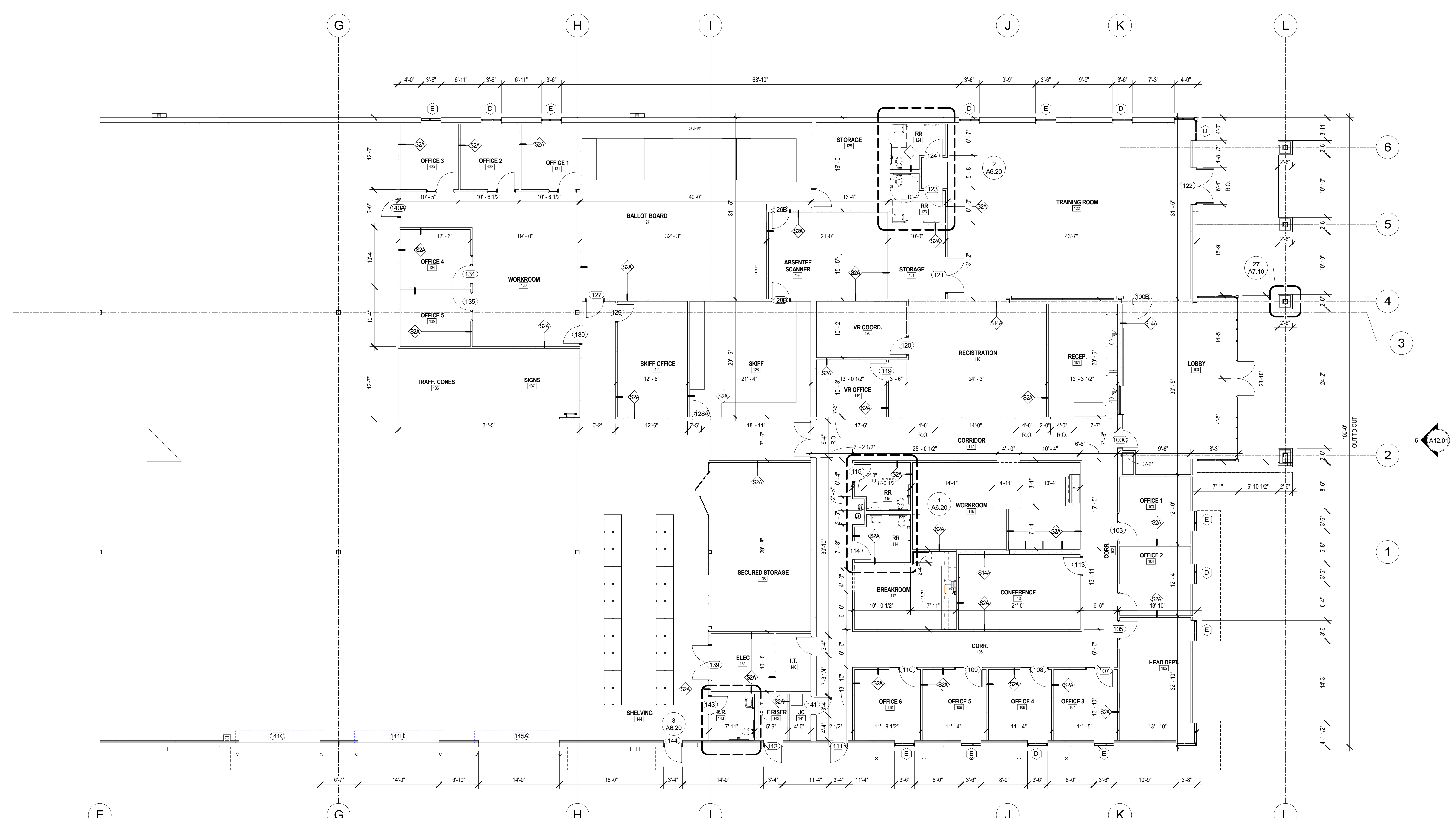


### CONSTRUCTION - KEY NOTES

- 01 REFER TO CIVIL DRAWINGS FOR TOP OF SLAB ELEVATION
- 02 THIS DRAWING IS INTENDED TO BE USED IN ASSOCIATION WITH ALL OTHER SUBMITTED DRAWINGS AND DOCUMENTS SPECIFIC TO THIS PROJECT
- 03 IF DIMENSIONS ARE IN QUESTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING CLARIFICATION FROM THE ARCHITECT BEFORE COMMENCING WITH CONSTRUCTION
- 04 DIMENSIONS ARE TO CENTERLINE OF STRUCTURAL COLUMN UNLESS NOTED OTHERWISE
- 05 DIMENSIONS FOR ELEVATIONS, SECTIONS AND DETAILS ARE CALLED OUT FROM TOP OF SLAB
- 06 CONTRACTOR TO COORDINATE WITH FRAME SCHEDULE FOR WALLS TO RECEIVE FINISHES & TREATMENTS. ALL SURFACES SUBSTRATES ARE TO BE PREPARED FOR FINISHES AS DIRECTED BY MANUFACTURERS' SPECIFICATIONS
- 07 CONTRACTOR TO PROVIDE WOOD BLOCKING FOR ALL WALLS AND DOORS. ALL WALLS AND DOORS TO BE BUILT TO SPECIFICATIONS AND FINISHES AS REQUIRED BY CONTRACTOR
- 08 ALL FINISH WORK TO BE SMOOTH AND FREE FROM ABRASION. ALL SPECIFIED FINISHES SHALL BE INSTALLED PER MANUFACTURERS' INSTRUCTIONS
- 09 DOOR OPENINGS NOT LOCATED BY DIMENSION SHALL BE CENTERED IN WALLS UNLESS LOCATED BY FRAME ADJACENT WALL TO REAR FACE OF DOOR FRAME
- 10 KEY NOTE 01 TEXT
- 11 KEY NOTE 01 TEXT
- 12 KEY NOTE 01 TEXT
- 13 KEY NOTE 01 TEXT
- 14 KEY NOTE 01 TEXT
- 15 KEY NOTE 01 TEXT
- 16 KEY NOTE 01 TEXT
- 17 KEY NOTE 01 TEXT
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- 26 KEY NOTE 01 TEXT
- 27 KEY NOTE 01 TEXT
- 28 KEY NOTE 01 TEXT
- 29 KEY NOTE 01 TEXT
- 30 KEY NOTE 01 TEXT

### GENERAL NOTES

1. DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS TAKE PRECEDENCE. CONTACT ARCHITECT IF CLARIFICATION IS NECESSARY IN ORDER TO DETERMINE THE MEAN OF THE CONTRACT DOCUMENTS.
2. DRAWINGS NOTED AS 1/2" OR 3/4" ARE NOT TO SCALE.
3. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE BUILDING CODES AND ALL APPLICABLE REGULATIONS AND ORDINANCES.
4. PROVIDE ALL DIMENSIONS AND FINISHES TO CENTERLINE UNLESS NOTED OTHERWISE. NOTIFY ARCHITECT OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH CONSTRUCTION.
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30. PROVIDE ALL DIMENSIONS AND FINISHES TO CENTERLINE UNLESS NOTED OTHERWISE. NOTIFY ARCHITECT OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH CONSTRUCTION.



**6** ENLARGED ADMIN FLOOR PLAN  
1/8" = 1'-0"



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Collaboration  
1206 Nance Street Houston, TX 77002 Tel.: 832.409.9050 Fax: 267.695.9035



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3700 Bamore Rd. Rosenberg TX, 77471

3700 BAMORE ROAD  
ROSENBERG, TX 77471  
FOR BID AND PERMIT



**KEY PLAN**  
PLAN NORTH  
TRUE NORTH

Project No.: 2330

Drawing Date: 01.17.2024  
Drawn: YG  
Checked: DM  
Scale: AS NOTED

Issue Log		
No.	Description	Date

Revisions:		
No.	Description	Date

ENLARGED ADMIN  
DIMENSIONED  
PLAN

**A1.02**

GENERAL EQUIPMENT NOTES

1. EQUIPMENT AND SEATING ARRANGEMENT LOCATIONS SHOWN BY SYMBOLS AND REFERENCE TO EQUIPMENT SCHEDULE.  
 2. REFER TO EQUIPMENT SCHEDULE FOR ALL EQUIPMENT SYMBOLS, MODEL, AND SPECIFIC REQUIREMENTS.  
 3. REFER TO EQUIPMENT SCHEDULE FOR ALL EQUIPMENT SYMBOLS, MODEL, AND SPECIFIC REQUIREMENTS.  
 4. REFER TO THE PROJECT MANUAL FOR SCOPE OF WORK DESCRIPTIONS.  
 5. CONTRACTOR SHALL VERIFY ALL EQUIPMENT REQUIREMENTS AND ARCHITECT.  
 6. CONTRACTOR SHALL VERIFY ALL EQUIPMENT REQUIREMENTS AND ARCHITECT.  
 7. QUANTITIES PROVIDED IN SCHEDULE SHALL BE SHOWN WITH PLAN.



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Project No.: 2330

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Revisions:

No.	Description	Date

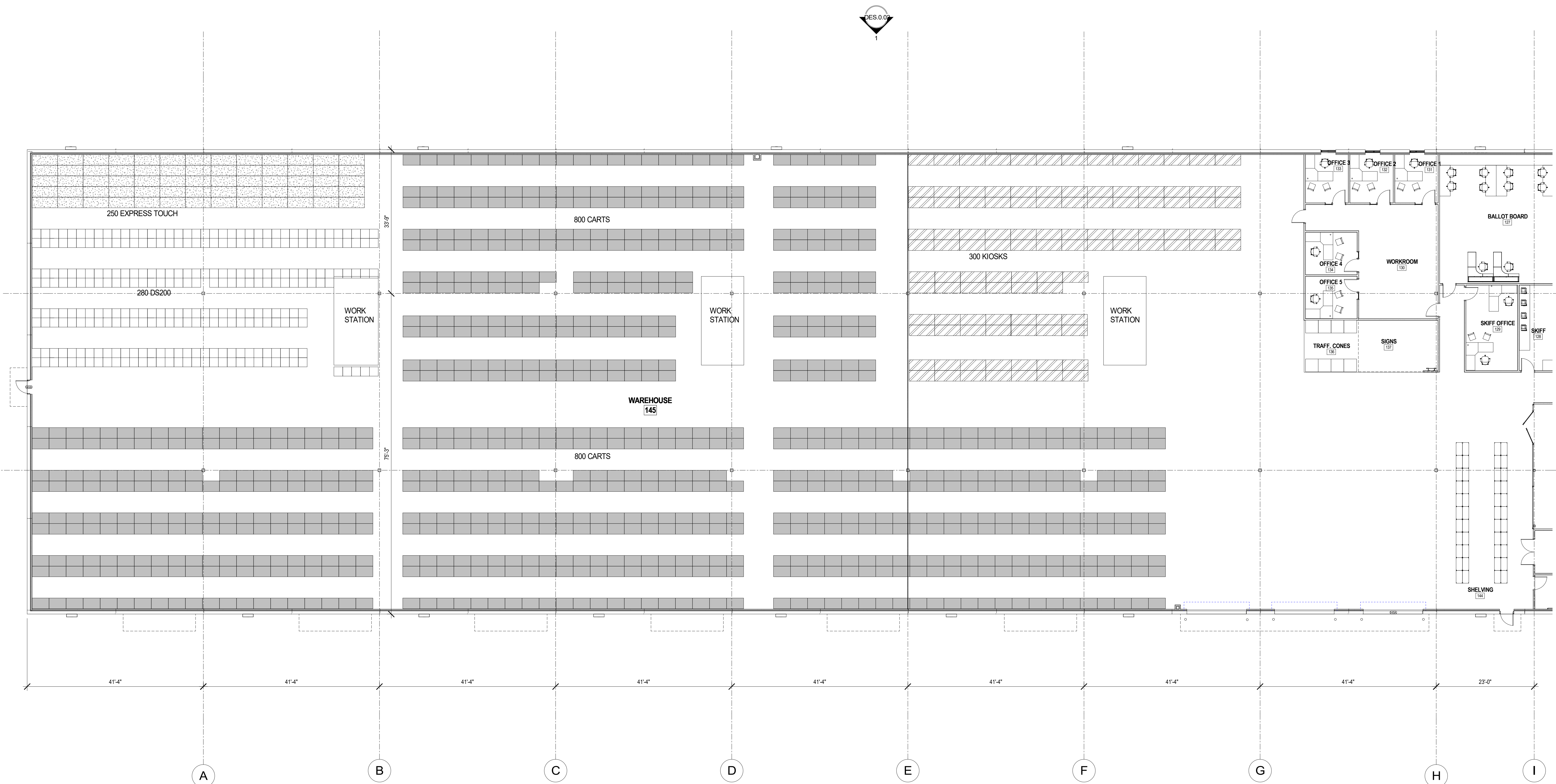
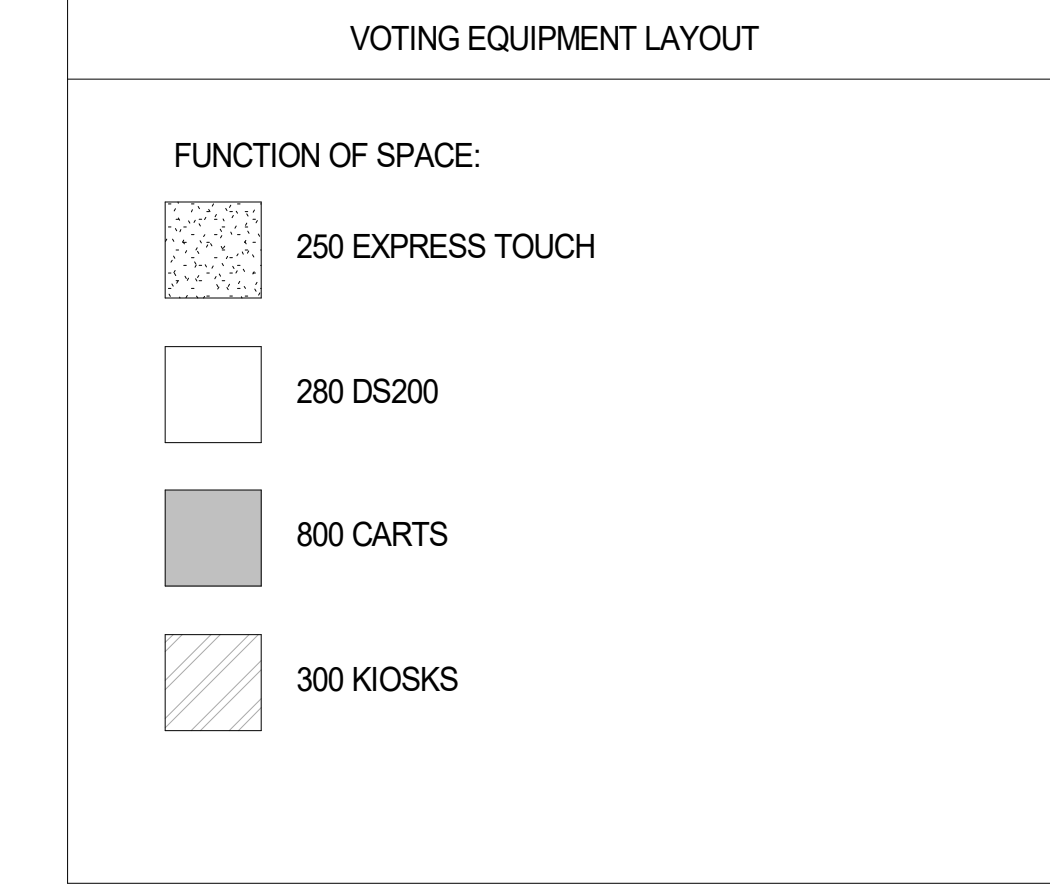


ADMIN FURNITURE PLAN

A2.01

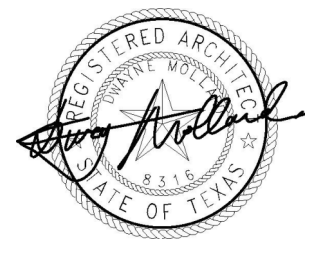
GENERAL NOTES

1. FOR ALL FIELD DIMENSIONS, VERIFY DIMENSIONS FROM PROCEEDING. CONTACT ARCHITECT FOR CLARIFICATION IF NECESSARY IN ORDER TO DETERMINE THE SCOPE OF THE CONTRACT DOCUMENTS.
2. VERIFY ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.
3. ALL DIMENSIONS ARE TO STRUCTURAL COLUMN LINE UNLESS NOTED OTHERWISE.
4. VERIFY ALL DIMENSIONS AND CONDITIONS BEFORE COMMENCING WORK. VERIFY FIELD OF ANY DISCREPANCIES FROM PROCEEDING.
5. NOTES OR DIMENSIONS NOTED AS "TYPICAL" OR "TYP" SHALL APPLY TO CONDITIONS THAT ARE THE SAME OR SIMILAR.
6. DIMENSIONS TO FACE UNLESS NOTED OTHERWISE.
7. DIMENSIONS TO FACE UNLESS NOTED OTHERWISE.
8. VERIFY DIMENSIONS FROM PROCEEDING.
9. VERIFY DIMENSIONS FROM PROCEEDING.
10. VERIFY DIMENSIONS FROM PROCEEDING.
11. VERIFY DIMENSIONS FROM PROCEEDING.
12. VERIFY DIMENSIONS FROM PROCEEDING.
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25. VERIFY DIMENSIONS FROM PROCEEDING.
26. VERIFY DIMENSIONS FROM PROCEEDING.
27. VERIFY DIMENSIONS FROM PROCEEDING.
28. VERIFY DIMENSIONS FROM PROCEEDING.
29. VERIFY DIMENSIONS FROM PROCEEDING.
30. VERIFY DIMENSIONS FROM PROCEEDING.



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Revisions:

No.	Description	Date

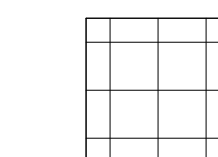
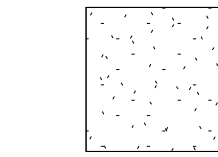
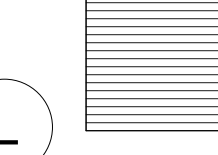

WAREHOUSE EQUIPMENT PLAN

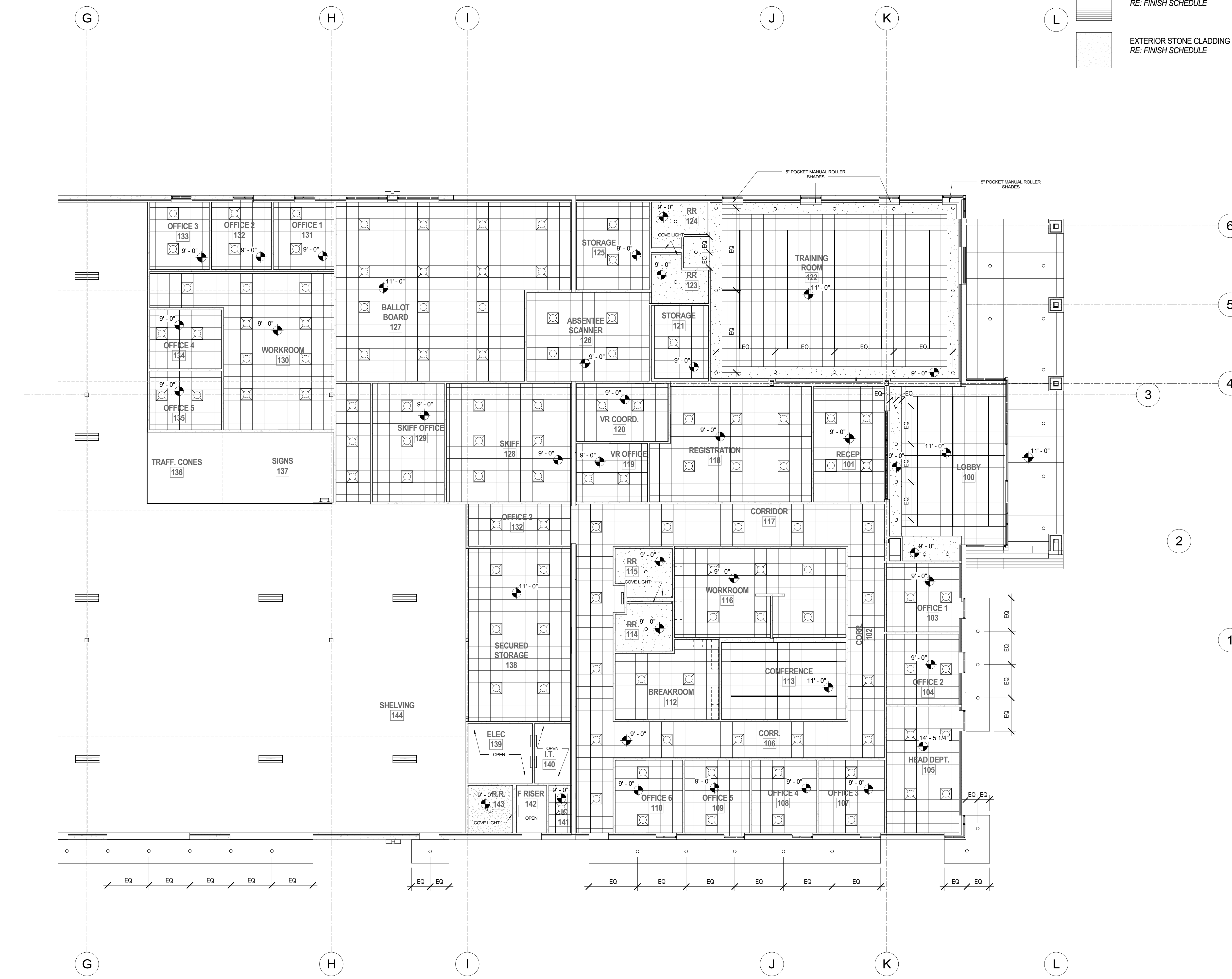
A2.02

GENERAL CEILING PLAN NOTES

1. REFER TO AISC CODES WITH ROOM FINISH SCHEDULES FOR SPECIFIC CEILING TYPES.  
 2. ALL CEILING ACCESSORIES SHALL BE INSTALLED FROM THE MAIN FLOOR LEVEL, UNLESS OTHERWISE NOTED. ALL CEILING ACCESSORIES SHALL BE INSTALLED FROM THE MAIN FLOOR LEVEL, UNLESS OTHERWISE NOTED.  
 3. ALL CEILING ACCESSORIES SHALL BE INSTALLED FROM THE MAIN FLOOR LEVEL, UNLESS OTHERWISE NOTED.  
 4. ALL CEILING ACCESSORIES SHALL BE INSTALLED FROM THE MAIN FLOOR LEVEL, UNLESS OTHERWISE NOTED.  
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 8. ALL CEILING ACCESSORIES SHALL BE INSTALLED FROM THE MAIN FLOOR LEVEL, UNLESS OTHERWISE NOTED.  
 9. ALL CEILING ACCESSORIES SHALL BE INSTALLED FROM THE MAIN FLOOR LEVEL, UNLESS OTHERWISE NOTED.  
 10. ALL CEILING ACCESSORIES SHALL BE INSTALLED FROM THE MAIN FLOOR LEVEL, UNLESS OTHERWISE NOTED.

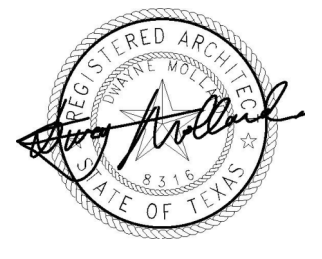
CEILING MATERIALS LEGEND

-  APC-TYPE 1 - 2' x 2' ACOUSTIC PANEL  
RE: FINISH SCHEDULE
-  GYPSUM BOARD  
RE: FINISH SCHEDULE
-  METAL PANEL SYSTEM  
RE: FINISH SCHEDULE
-  EXTERIOR STONE CLADDING SYSTEM  
RE: FINISH SCHEDULE



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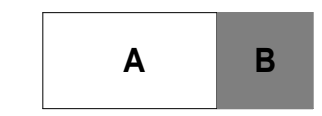
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KEY PLAN  
 PLAN NORTH  
 TRUE NORTH

Project No.: 2330

Drawing Date: 12/07/23  
 Drawn: YG  
 Checked: DM  
 Scale: AS NOTED

Issue Log

No.	Description	Date

Revisions:

No.	Description	Date

REFLECTED  
 CEILING PLAN -  
 ADMIN

A3.01

GENERAL CEILING PLAN NOTES

1. REFER TO AISC CODEBOOK WITH ROOM FRAMES SCHEDULES FOR SPECIFIC CEILING TYPES.  
 2. ALL CEILING GRID LINES MUST BE FROM THE MAIN FLOOR LEVEL, WITHIN THE ROOM AND ON SPACES, AND ARE NOT FROM AN ELEVATED FLOOR LEVEL, AND ARE NOT FROM A SECOND FLOOR LEVEL.  
 3. REFER TO THE PROJECT SPECIFICATIONS FOR CEILING TYPES. ALL CEILING TYPES SHALL BE CONFORMANT WITH THE LISTED CEILING TYPES.  
 4. ONLY CEILING TYPES THAT ARE LISTED IN THE LISTED CEILING TYPES SHALL BE USED. CEILING TYPES NOT LISTED IN THE LISTED CEILING TYPES SHALL BE REFERRED TO AS UNLISTED CEILING TYPES. REFER TO THE PROJECT SPECIFICATIONS FOR CEILING TYPES.  
 5. CEILING TYPES SHALL BE LISTED IN THE LISTED CEILING TYPES. CEILING TYPES NOT LISTED IN THE LISTED CEILING TYPES SHALL BE REFERRED TO AS UNLISTED CEILING TYPES. REFER TO THE PROJECT SPECIFICATIONS FOR CEILING TYPES.  
 6. CEILING TYPES SHALL BE LISTED IN THE LISTED CEILING TYPES. CEILING TYPES NOT LISTED IN THE LISTED CEILING TYPES SHALL BE REFERRED TO AS UNLISTED CEILING TYPES. REFER TO THE PROJECT SPECIFICATIONS FOR CEILING TYPES.  
 7. REFER TO THE PROJECT SPECIFICATIONS FOR CEILING TYPES.  
 8. REFER TO THE PROJECT SPECIFICATIONS FOR CEILING TYPES.  
 9. REFER TO THE PROJECT SPECIFICATIONS FOR CEILING TYPES.  
 10. REFER TO THE PROJECT SPECIFICATIONS FOR CEILING TYPES.



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KEY PLAN  
 PLAN NORTH  
 TRUE NORTH

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Issue Log		
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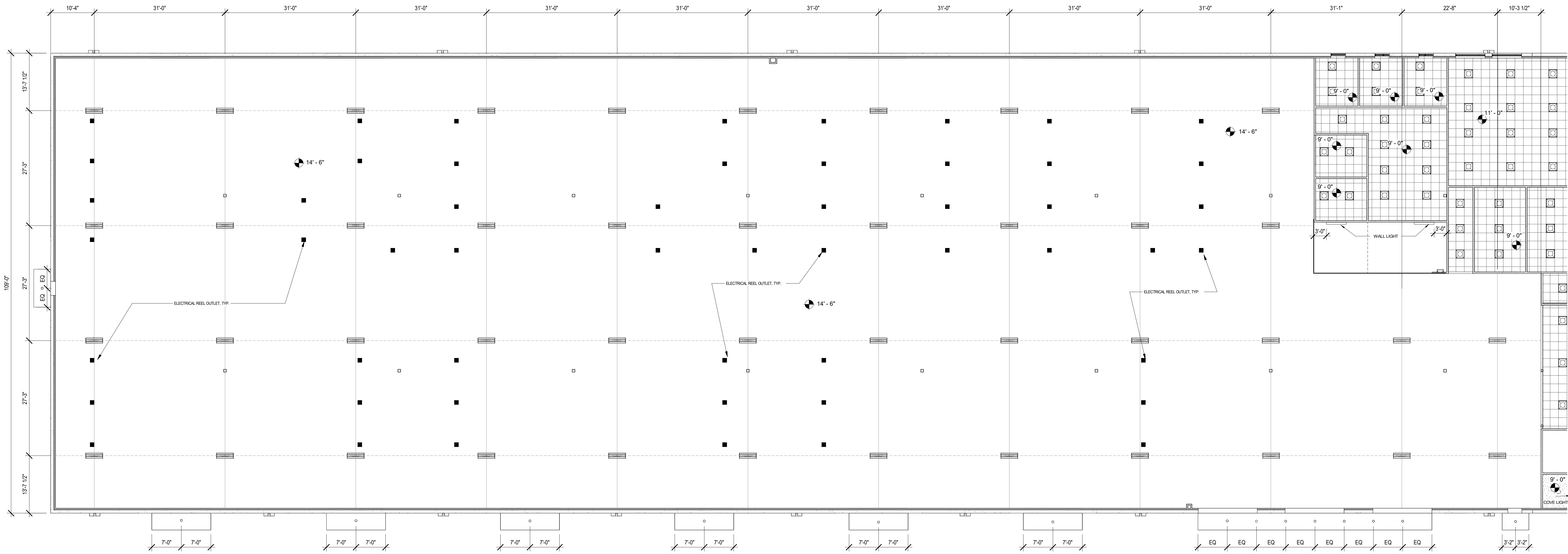
  

Revisions:		
No.	Description	Date

REFLECTED  
 CEILING PLAN -  
 WAREHOUSE

A3.02

6 RCP - WAREHOUSE  
 3/32" = 1'-0"



Autodesk Docs/2330 FBC Elections Admin Facility revit 2023/24\_0105 FBC Election admin.rvt 1/17/2024 4:20:02 PM



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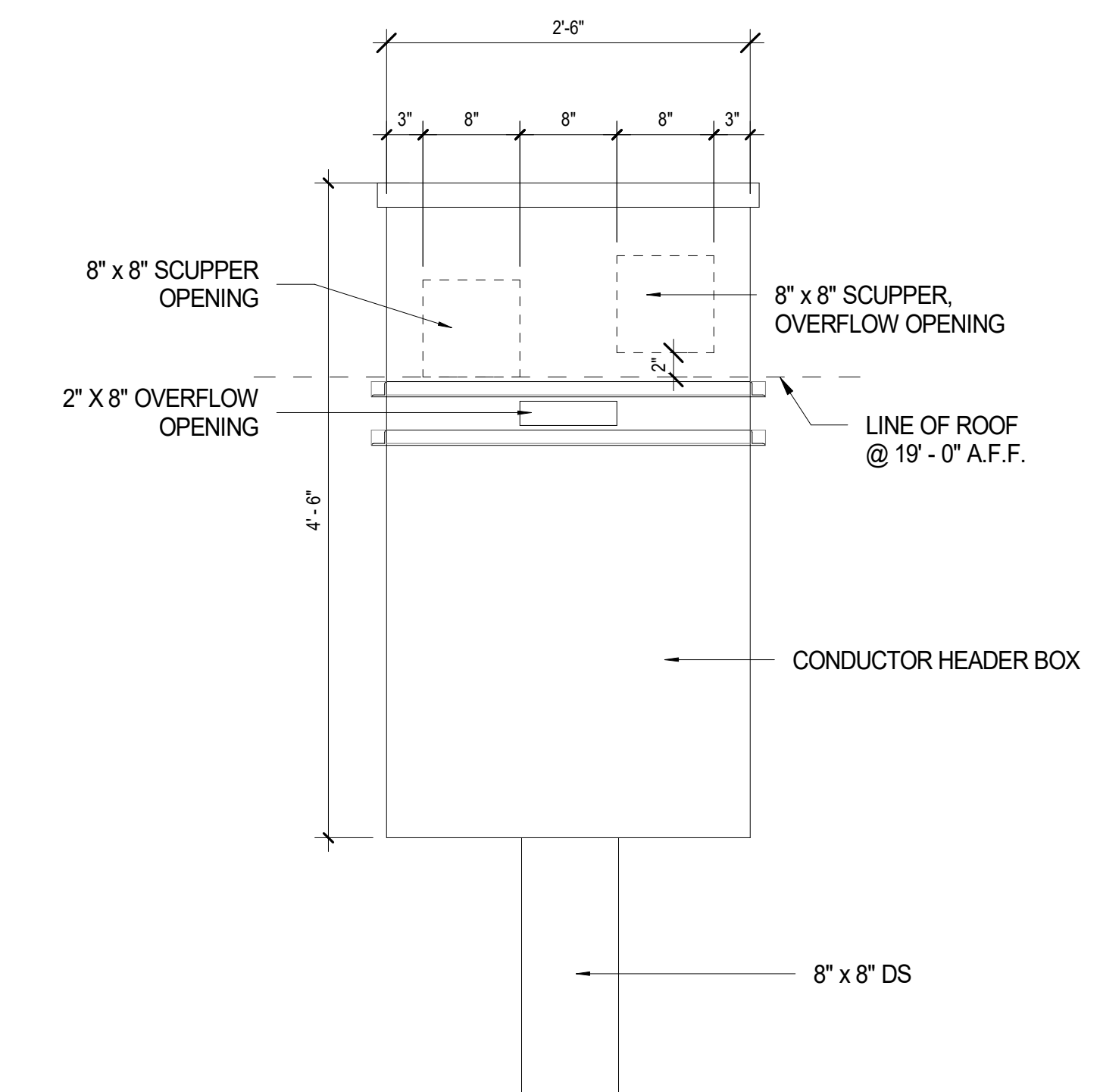
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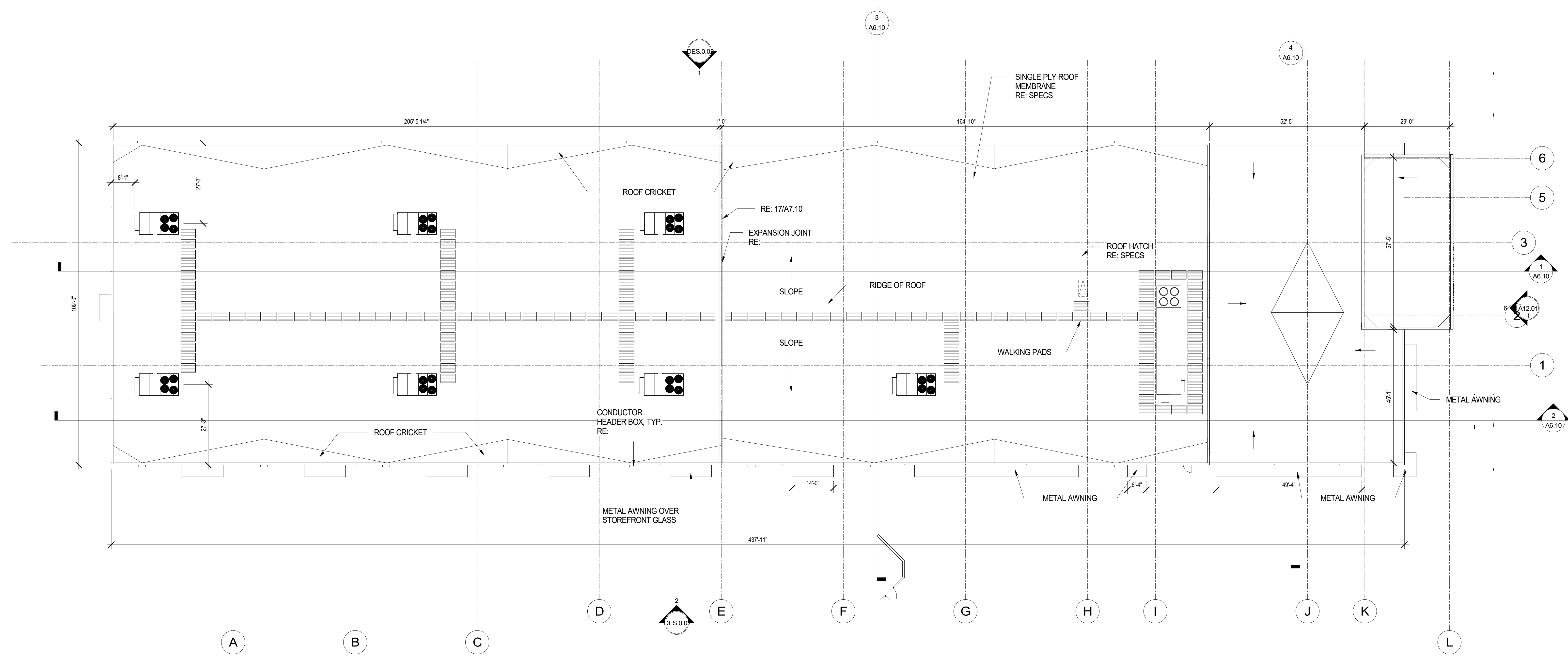
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**GENERAL NOTES**

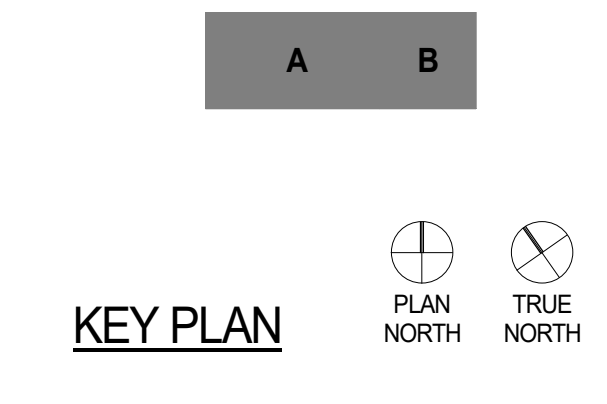
1. VERIFY ALL DIMENSIONS AND CONDITIONS AGAINST THE PROJECT RECORDS AND SPECIFICATIONS. CONTACT ARCHITECT FOR CLARIFICATION IF NECESSARY IN ORDER TO DETERMINE THE INTENT OF THE CONTRACT DOCUMENTS.
2. DIMENSIONS SHOWN ON THIS DRAWING ARE TO FACE UNLESS NOTED OTHERWISE.
3. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.
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20. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.



**20** CONDUCTOR HEAD DETAIL  
1" = 1'-0"



**1** HIGH ROOF  
1/16" = 1'-0"



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**ROOF PLAN**

**A4.01**





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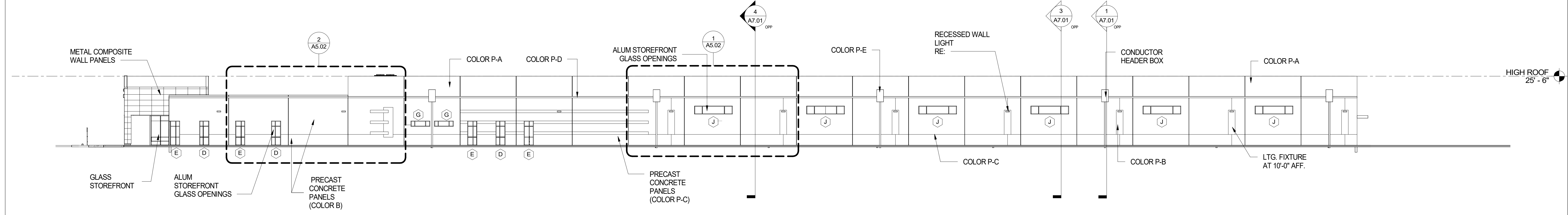
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**GENERAL NOTES**

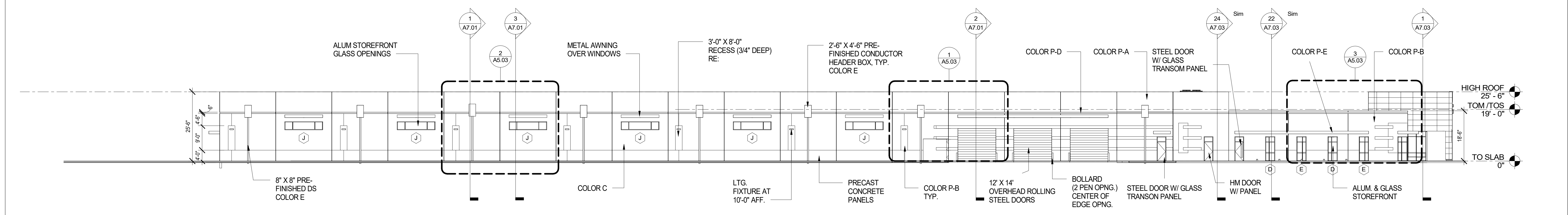
1. DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS TAKE PRECEDENCE. CONTACT ARCHITECT FOR CLARIFICATION IF NECESSARY IN ORDER TO DETERMINE THE INTENT OF THE DRAWING.
2. DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.
3. VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS BEFORE COMMENCING WORK. NOTIFY ARCHITECT OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH PROCEEDING WORK.
4. MATERIALS AND METHODS ARE SUBJECT TO CHANGE BY THE ARCHITECT. VERIFY ALL MATERIALS AND METHODS WITH THE ARCHITECT BEFORE PROCEEDING.
5. DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.
6. VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS BEFORE COMMENCING WORK. NOTIFY ARCHITECT OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH PROCEEDING WORK.
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**EXTERIOR MATERIALS LEGEND**

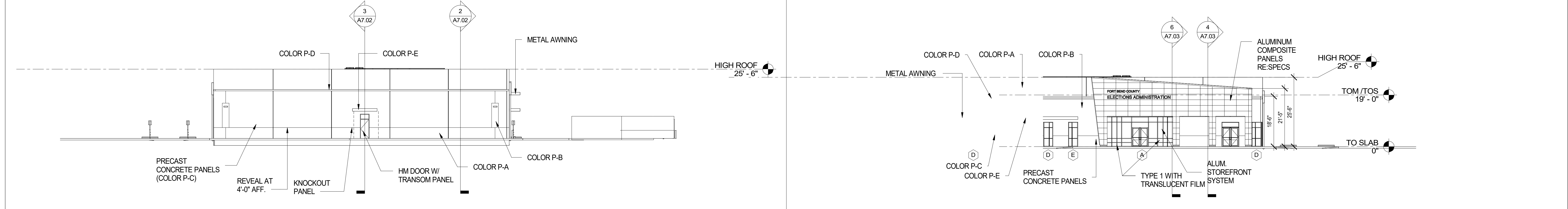
- COLOR A
- COLOR B
- COLOR C
- COLOR D
- COLOR E



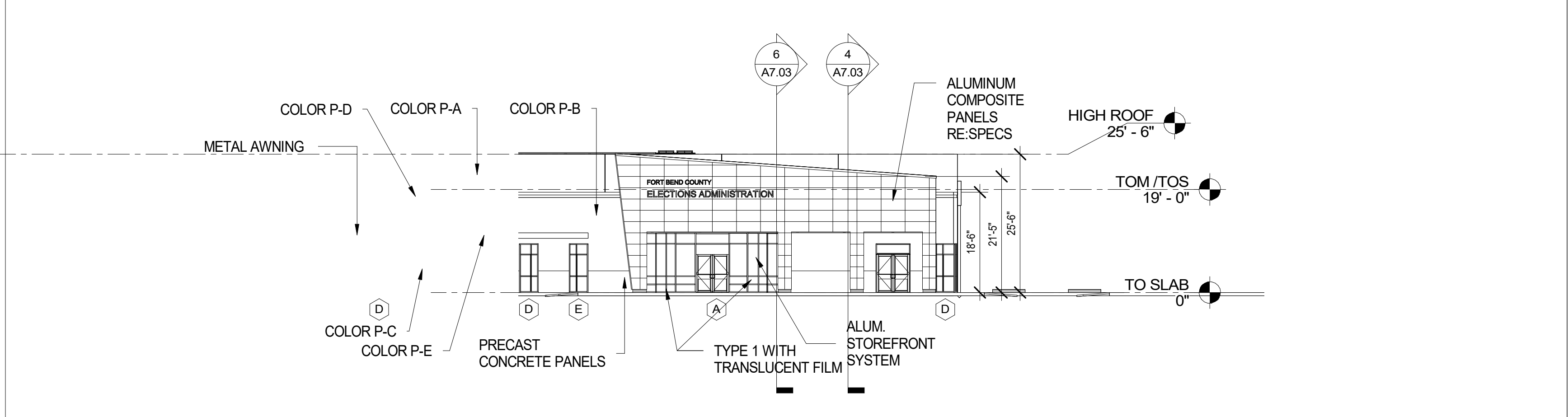
**4 NORTH ELEVATION**  
1/16" = 1'-0"



**3 SOUTH ELEVATION**  
1/16" = 1'-0"



**2 WEST ELEVATION**  
1/16" = 1'-0"



**1 EAST ELEVATION**  
1/16" = 1'-0"

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**KEY PLAN**  
PLAN NORTH  
TRUE NORTH

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**EXTERIOR ELEVATIONS**

**A5.01**



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**TILT WALL PAINT COLOR LEGEND**

- SW 7537 IRISH CREAM
- SW 7507 STONE LION
- SW 7514 FOOTHILLS
- SW 6229 TEMPE STAR
- SW 7599 BRICK PAVER

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**KEY PLAN**  
PLAN NORTH  
TRUE NORTH

Project No.: 2330

Drawing Date: 12/07/23  
Drawn: YG  
Checked: DM  
Scale: AS NOTED

Issue Log:

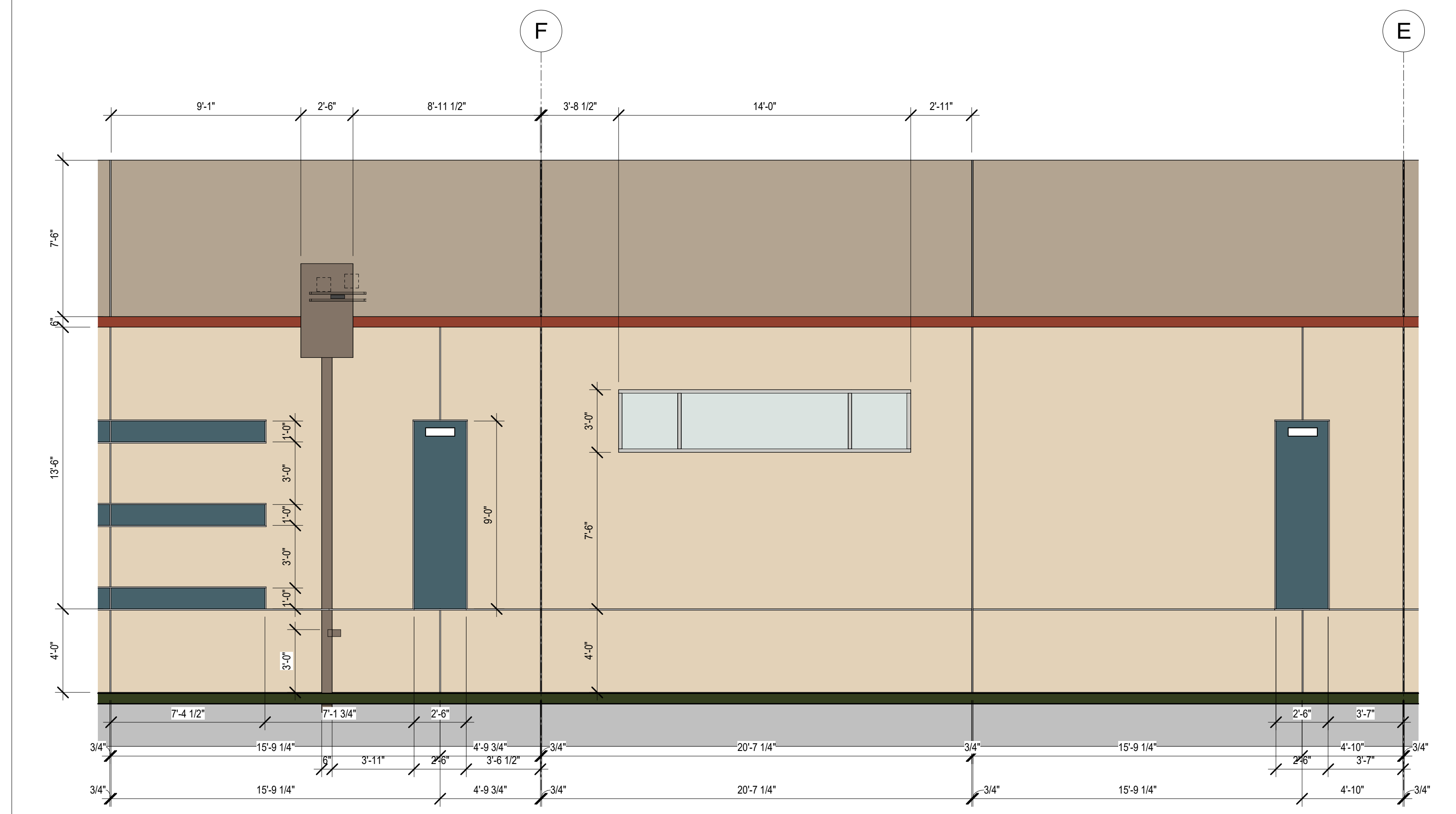
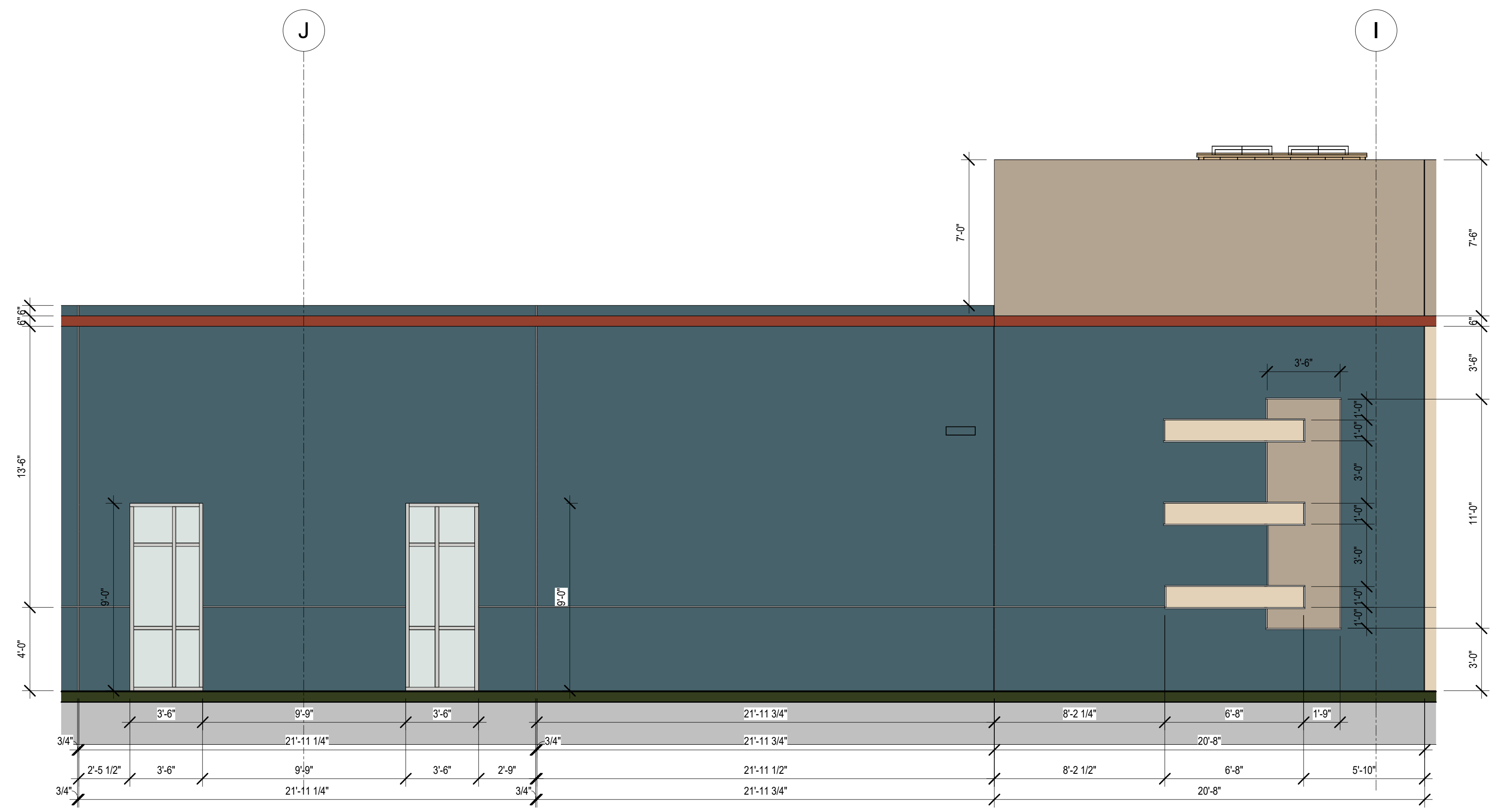
No.	Description	Date

Revisions:

No.	Description	Date

**ENLARGED ELEVATIONS**

**A5.02**



**2 ENLARGED NORTH ELEVATION**  
1/4" = 1'-0"

**1 ENLARGED NORTH ELEVATION**  
1/4" = 1'-0"



GENERAL CASEWORK NOTES

1. BASIS OF DESIGN FOR ALL WORKSPACE CASEWORK SHALL BE \_\_\_\_\_ UNLESS NOTED OTHERWISE.
2. BASIS OF DESIGN FOR ALL WORKSPACE CASEWORK SHALL BE \_\_\_\_\_ UNLESS NOTED OTHERWISE.
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16. BASIS OF DESIGN FOR ALL WORKSPACE CASEWORK SHALL BE \_\_\_\_\_ UNLESS NOTED OTHERWISE.
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A B

KEY PLAN  
PLAN NORTH  
TRUE NORTH

Project No.: 2330

Drawing Date: 12/07/23  
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Scale: AS NOTED

Issue Log

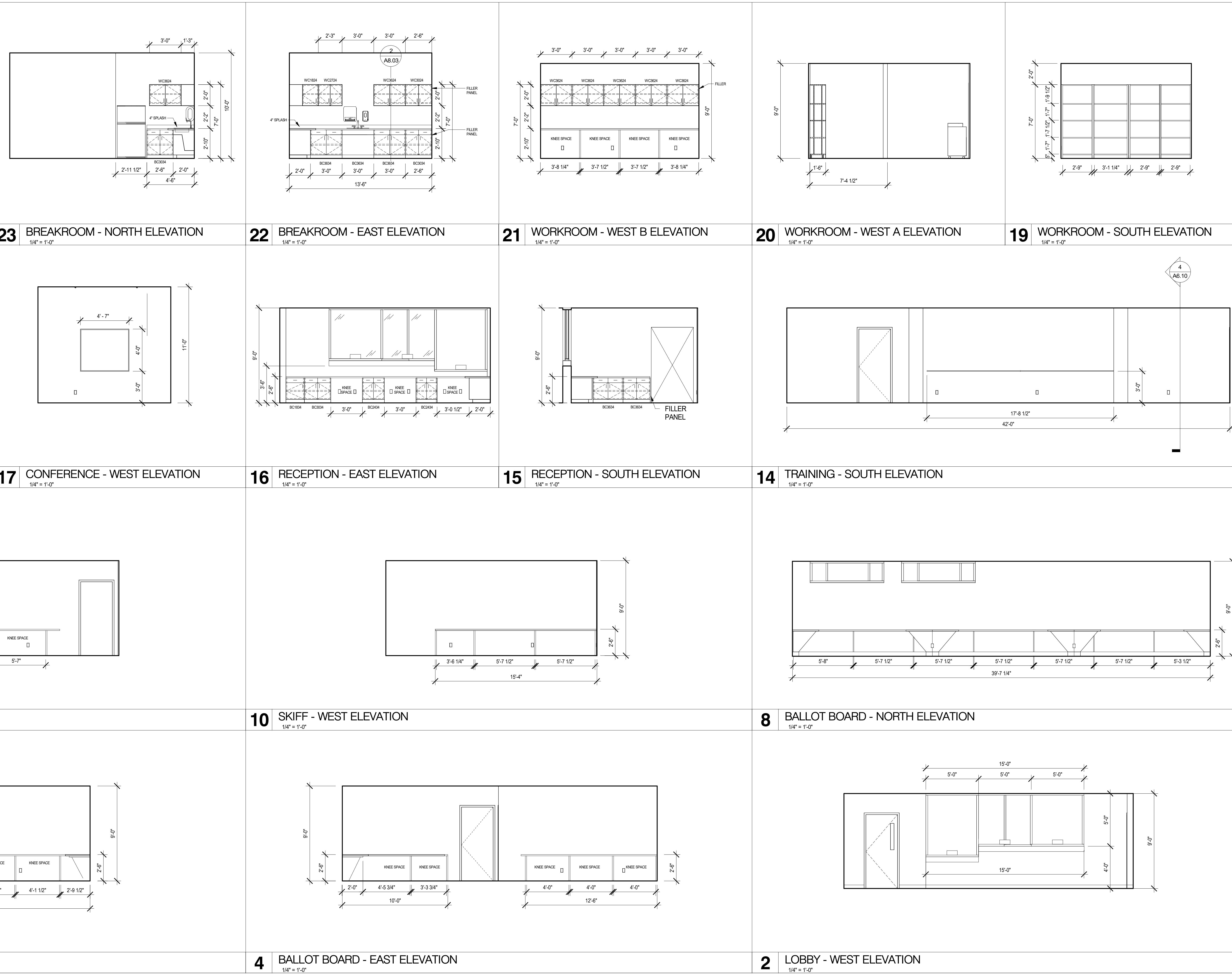
No.	Description	Date

Revisions:

No.	Description	Date

INTERIOR ELEVATIONS

A5.04



23	BREAKROOM - NORTH ELEVATION $1/4" = 1'-0"$
22	BREAKROOM - EAST ELEVATION $1/4" = 1'-0"$
21	WORKROOM - WEST B ELEVATION $1/4" = 1'-0"$
20	WORKROOM - WEST A ELEVATION $1/4" = 1'-0"$
19	WORKROOM - SOUTH ELEVATION $1/4" = 1'-0"$
18	WORKROOM - EAST ELEVATION $1/4" = 1'-0"$
17	CONFERENCE - WEST ELEVATION $1/4" = 1'-0"$
16	RECEPTION - EAST ELEVATION $1/4" = 1'-0"$
15	RECEPTION - SOUTH ELEVATION $1/4" = 1'-0"$
14	TRAINING - SOUTH ELEVATION $1/4" = 1'-0"$
12	SKIFF - SOUTH ELEVATION $1/4" = 1'-0"$
10	SKIFF - WEST ELEVATION $1/4" = 1'-0"$
8	BALLOT BOARD - NORTH ELEVATION $1/4" = 1'-0"$
6	SKIFF - EAST ELEVATION $1/4" = 1'-0"$
4	BALLOT BOARD - EAST ELEVATION $1/4" = 1'-0"$
2	LOBBY - WEST ELEVATION $1/4" = 1'-0"$



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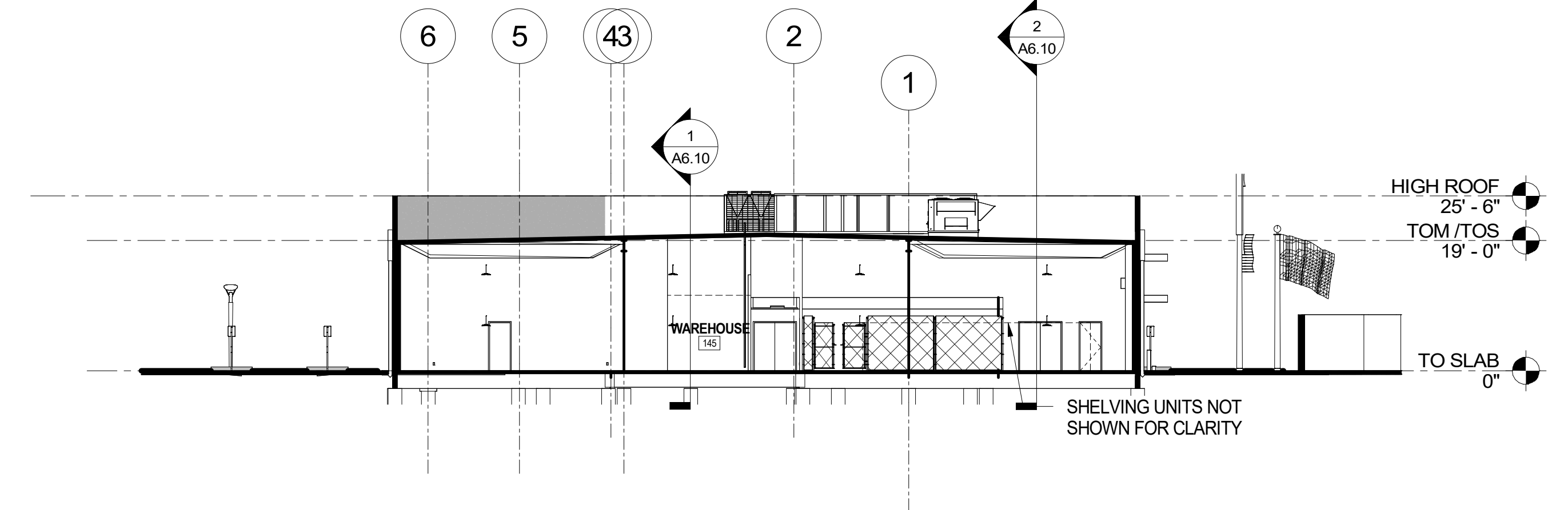
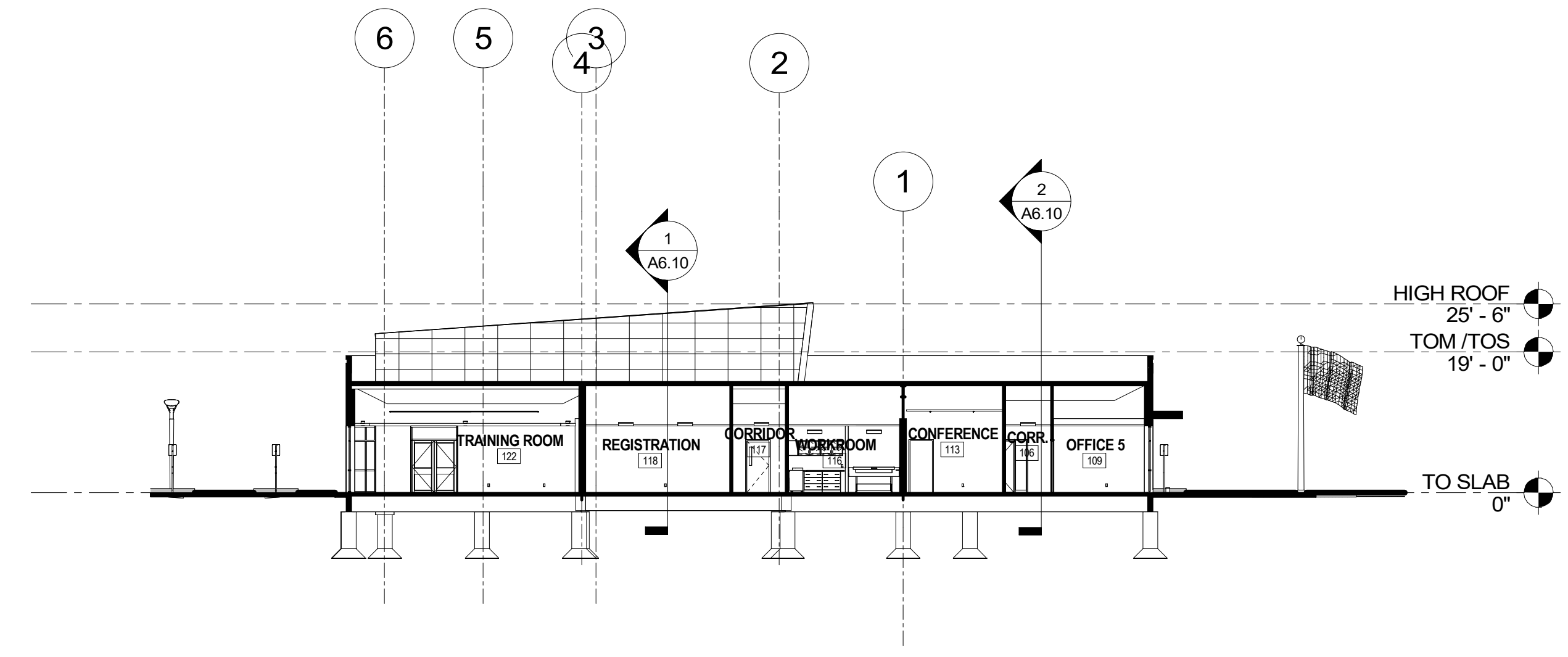
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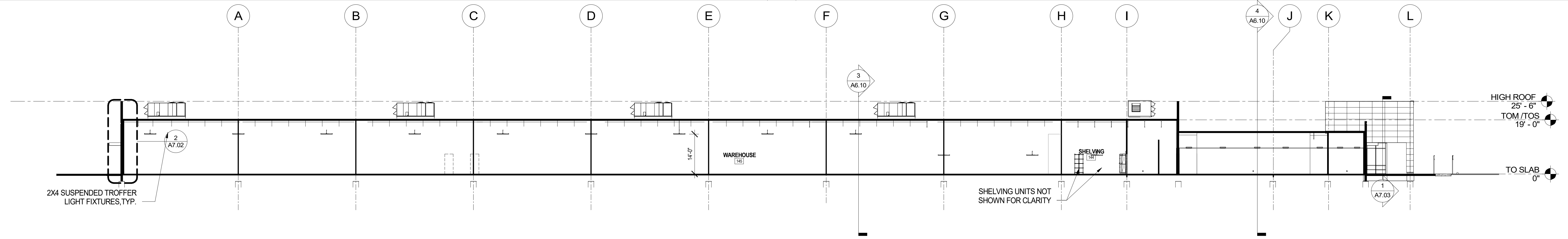
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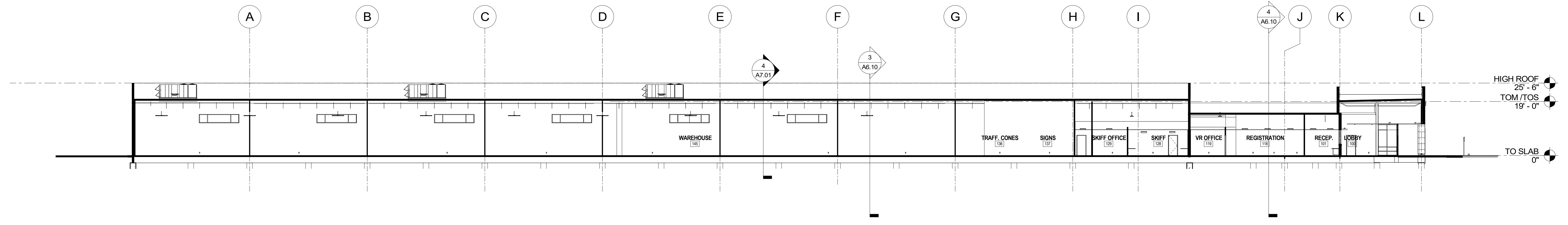


**4** BUILDING SECTION C  
1/16" = 1'-0"

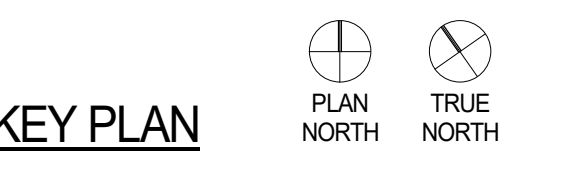
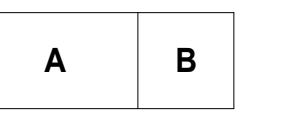
**3** BUILDING SECTION B  
1/16" = 1'-0"



**2** BUILDING SECTION A1  
1/16" = 1'-0"



**1** BUILDING SECTION A  
1/16" = 1'-0"



Project No.: 2330

Drawing Date: 12/07/23  
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Scale: AS NOTED

Issue Log:

No.	Description	Date

Revisions:

No.	Description	Date

BUILDING SECTIONS

A6.10



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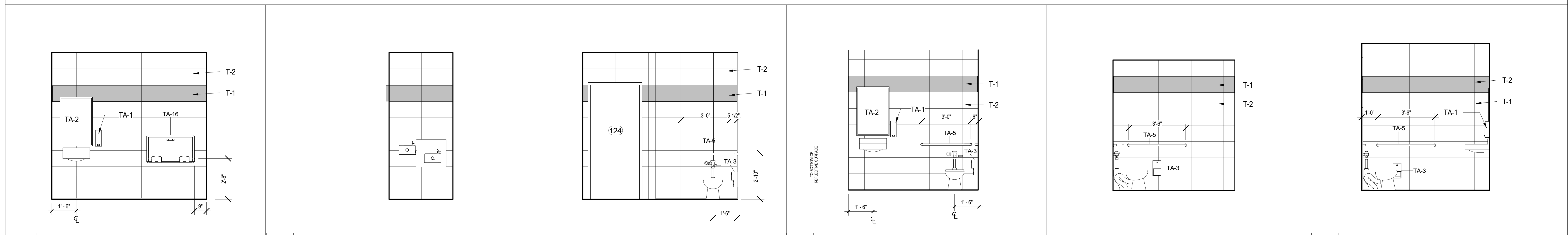
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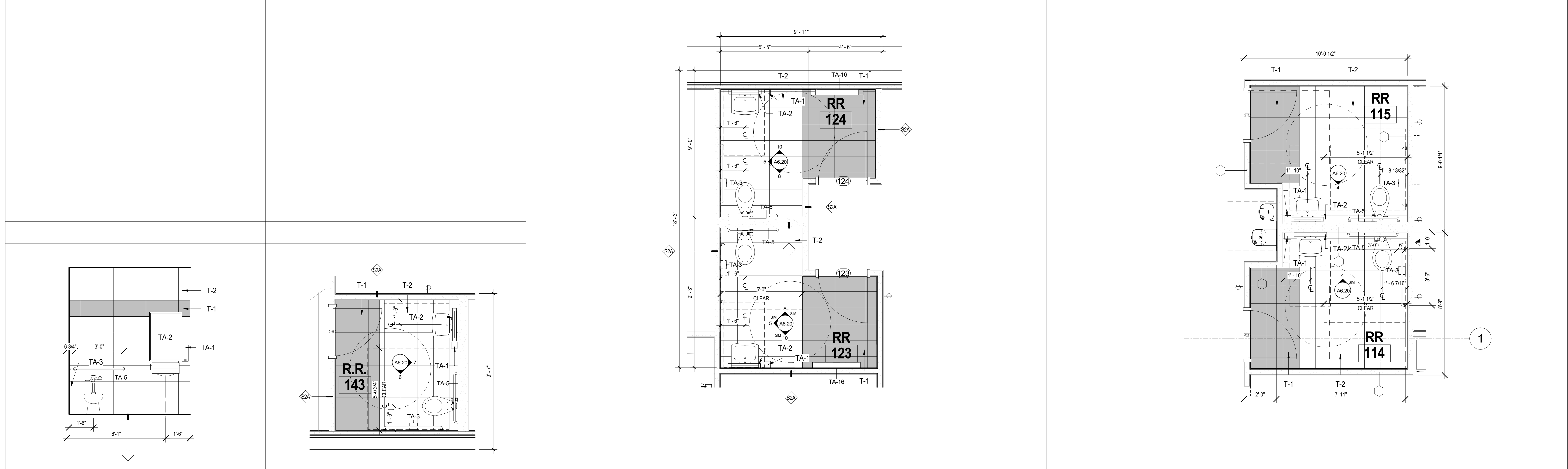
TOILET ACCESSORIES		
LABEL	DESCRIPTION	REMARKS
TA-1	SOAP DISPENSER	
TA-2	MIRROR	
TA-3	TOILET PAPER DISPENSER	
TA-4	PAPER TOWEL DISPENSER	
TA-5	GRAB BARS (AT TYPICAL ACCESSIBLE TOILET STALL)	
TA-6	GRAB BARS (AT TYPICAL ACCESSIBLE TOILET STALL)	
TA-7	GRAB BARS (AT TYPICAL ACCESSIBLE TOILET STALL)	
TA-8	GRAB BARS (AT TYPICAL ACCESSIBLE TOILET STALL)	
TA-9	GRAB BARS (AT TYPICAL ACCESSIBLE TOILET STALL)	
TA-10	GRAB BARS (AT TYPICAL ACCESSIBLE TOILET STALL)	
TA-11	GRAB BARS (AT TYPICAL ACCESSIBLE TOILET STALL)	
TA-12	GRAB BARS (AT TYPICAL ACCESSIBLE TOILET STALL)	
TA-13	GRAB BARS (AT TYPICAL ACCESSIBLE TOILET STALL)	
TA-14	GRAB BARS (AT TYPICAL ACCESSIBLE TOILET STALL)	
TA-15	GRAB BARS (AT TYPICAL ACCESSIBLE TOILET STALL)	
TA-16	GRAB BARS (AT TYPICAL ACCESSIBLE TOILET STALL)	
TA-17	GRAB BARS (AT TYPICAL ACCESSIBLE TOILET STALL)	
TA-18	GRAB BARS (AT TYPICAL ACCESSIBLE TOILET STALL)	
TA-19	GRAB BARS (AT TYPICAL ACCESSIBLE TOILET STALL)	

NOTE: ALL TOILET ACCESSORIES SHALL BE CONTRACTOR FURNISHED AND CONTRACTOR INSTALLED UNLESS NOTED OTHERWISE.

- COORDINATE FINAL LOCATIONS WITH ARCHITECT PRIOR TO INSTALLATION.
- CONTRACTOR IS TO VERIFY ALL HEIGHTS OF ACCESSORIES TO COMPLY WITH ALL APPLICABLE ACCESSIBILITY REQUIREMENTS.
- REFER TO ALL FINISHES AND COLORS IN FINISH SCHEDULE, VERIFY ALL PATTERNS WITH ARCHITECT.
- ALUMINUM ON CENTER OF LAVATORY.
- ONE HOOK SHALL BE INSTALLED INSIDE DOOR AT EACH TOILET PARTITION, ONE HOOK INSIDE DOOR AT SINGLE TOILET ROOMS AND ONE HOOK AT EACH SHOWER.



**10** MEN'S 126 - NORTH ELEVATION 3/8" = 1'-0"  
**9** DRINKING FOUNTAIN ELEVATION 3/8" = 1'-0"  
**8** MEN'S 126 - SOUTH ELEVATION 3/8" = 1'-0"  
**7** RR 136 - EAST ELEVATION 3/8" = 1'-0"  
**6** RR 136 - SOUTH ELEVATION 3/8" = 1'-0"  
**5** MEN'S 126 - WEST ELEVATION 3/8" = 1'-0"



**4** WOMEN 117 - SOUTH ELEV. 3/8" = 1'-0"  
**3** ENLARGED RR PLAN - 136 3/8" = 1'-0"  
**2** ENLARGED RESTROOMS PLAN - 125 & 126 3/8" = 1'-0"  
**1** ENLARGED RESTROOM PLAN - 116 & 117 3/8" = 1'-0"

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A	B
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KEY PLAN  
  
PLAN NORTH  
  
TRUE NORTH

Project No.: 2330

Drawing Date: 12/07/23  
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 Scale: AS NOTED

Issue Log:

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Revisions:

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ENLARGED  
RESTROOMS PLAN

A6.20





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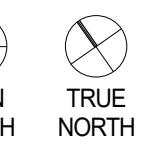
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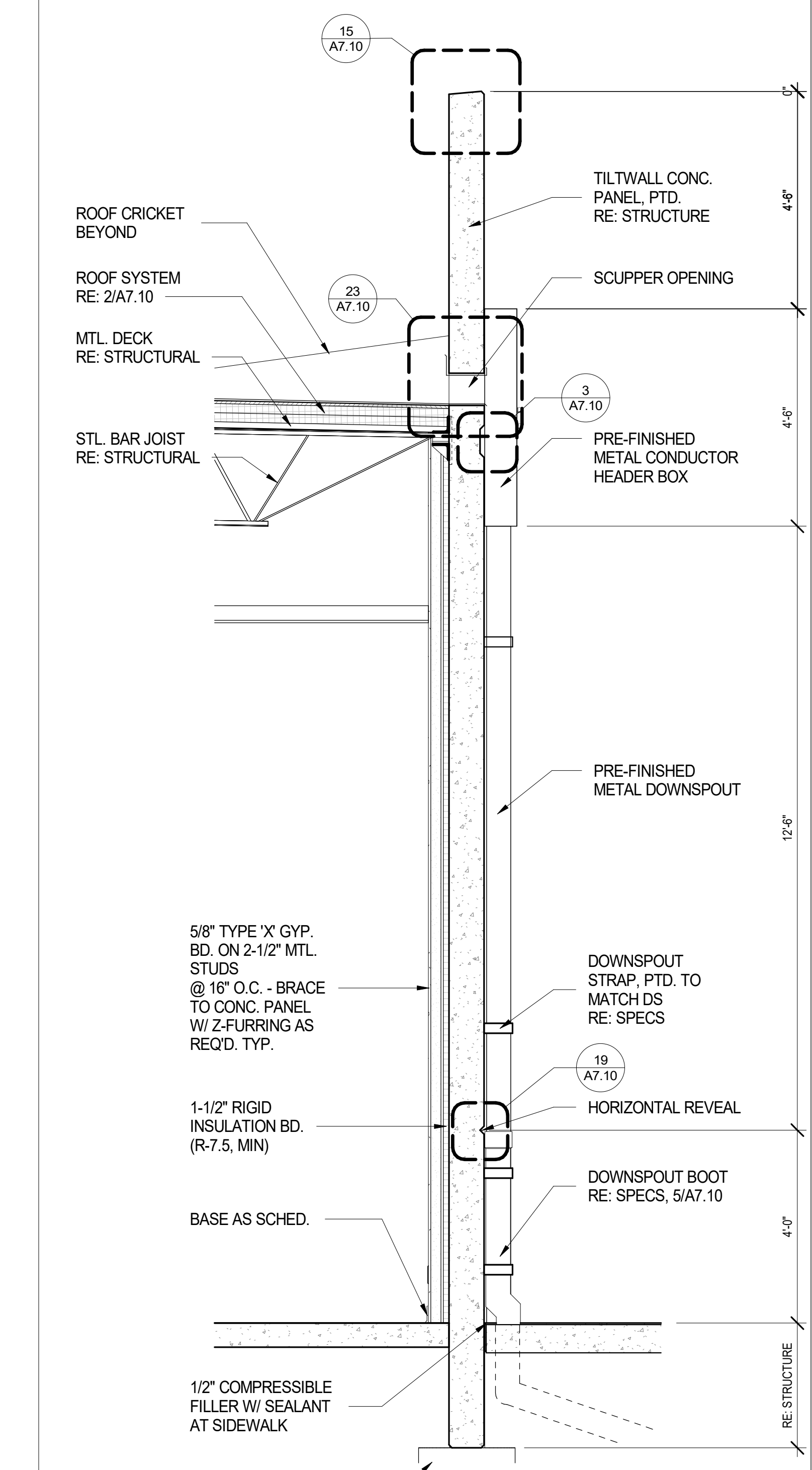
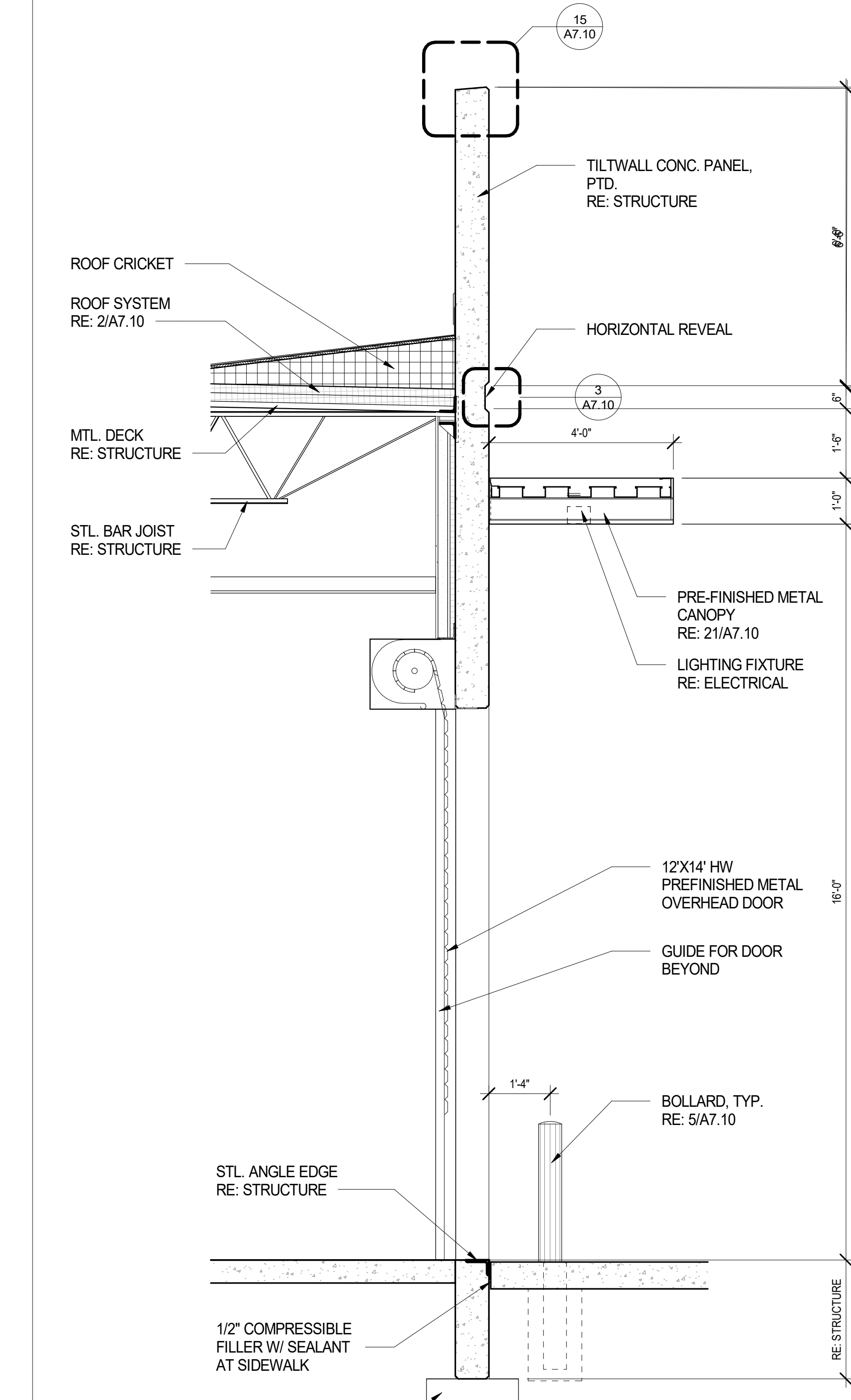
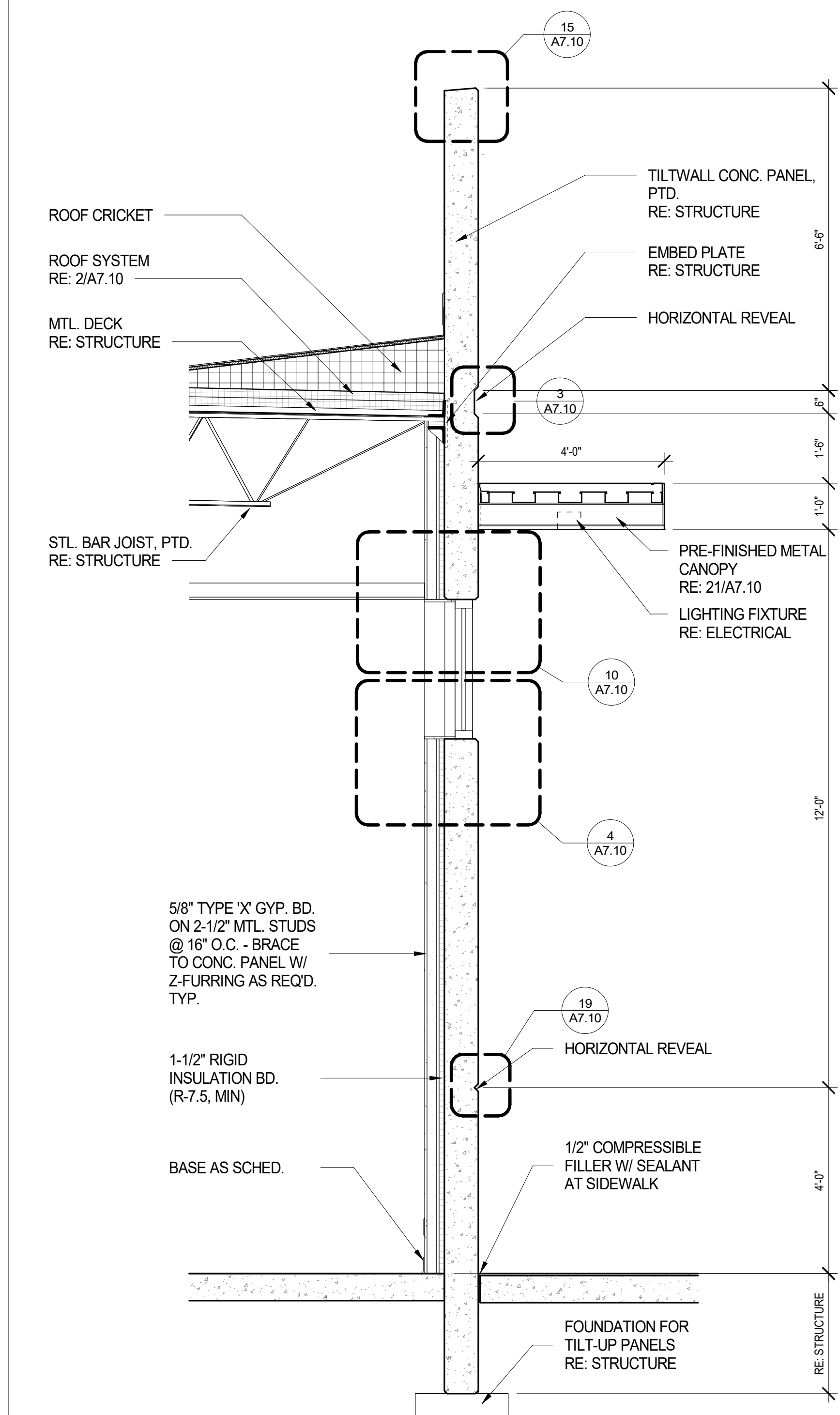
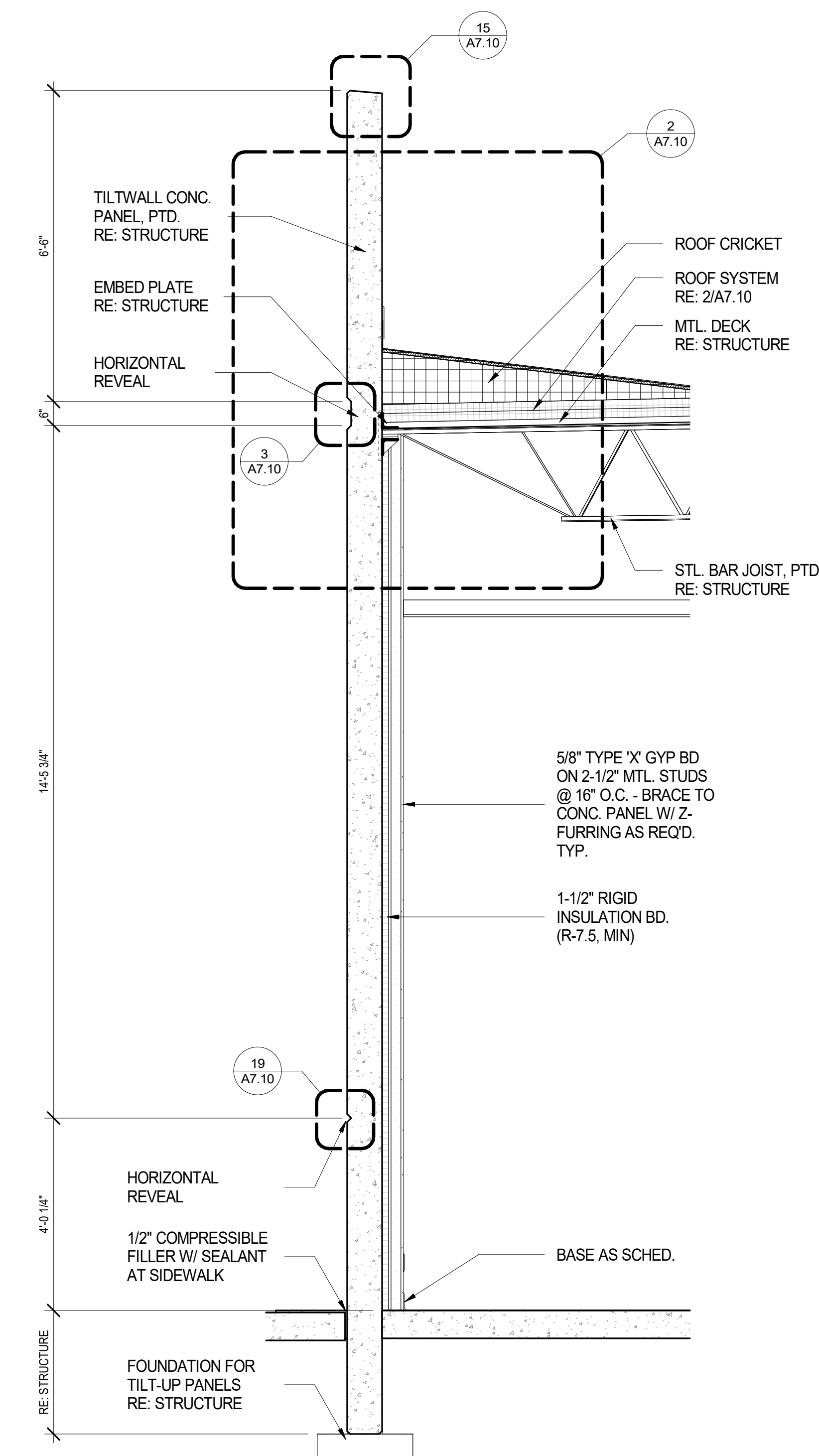
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Revisions:

No.	Description	Date

**WALL SECTIONS**

**A7.01**



Autodesk Docs/2330 FBC Elections Admin Facility revit 2023/24\_0105 FBC Election admin.rvt  
1/17/2024 4:20:29 PM

**4** TILT WALL SECTION AT WAREHOUSE 1/2" = 1'-0"  
**3** TILT WALL SECTION AT WAREHOUSE W/ CANOPY 1/2" = 1'-0"  
**2** OH DOOR AT WAREHOUSE 1/2" = 1'-0"  
**1** DOWNSPOUT AT WAREHOUSE 1/2" = 1'-0"





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A B

KEY PLAN  
FLM NORTH  
TRU NORTH

Project No.: 2330

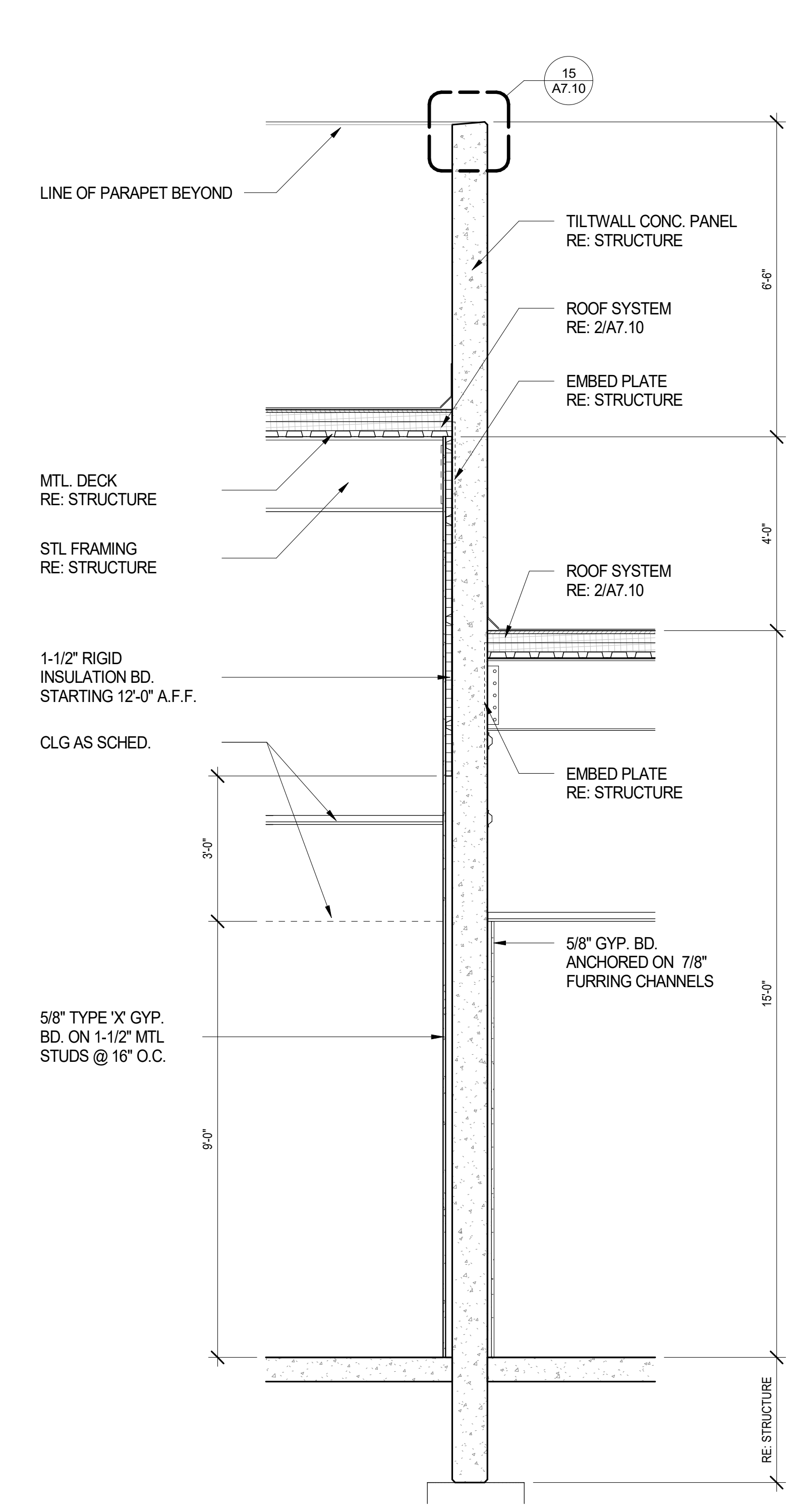
Drawing Date: 12/07/23  
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No.	Description	Date

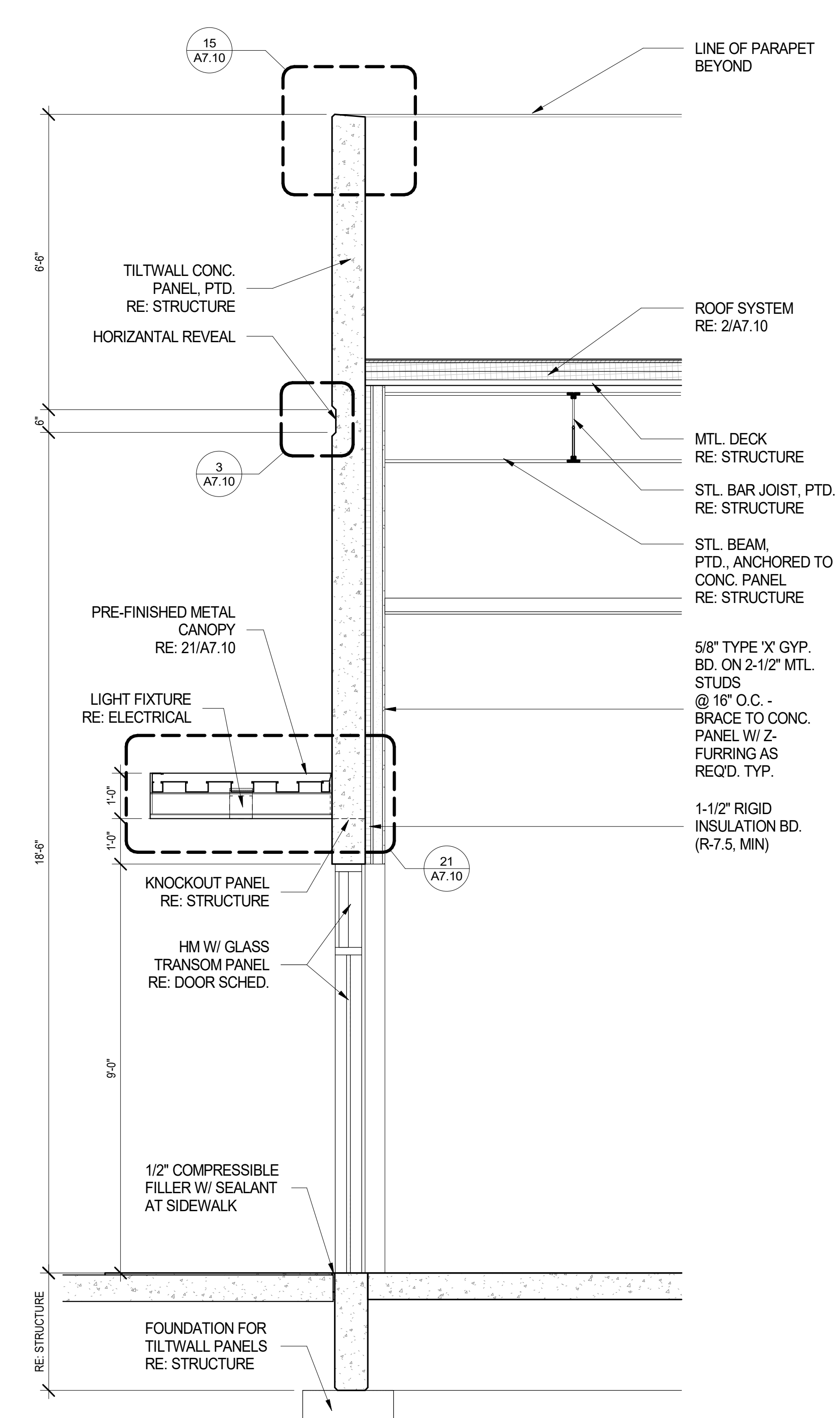
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WALL SECTIONS

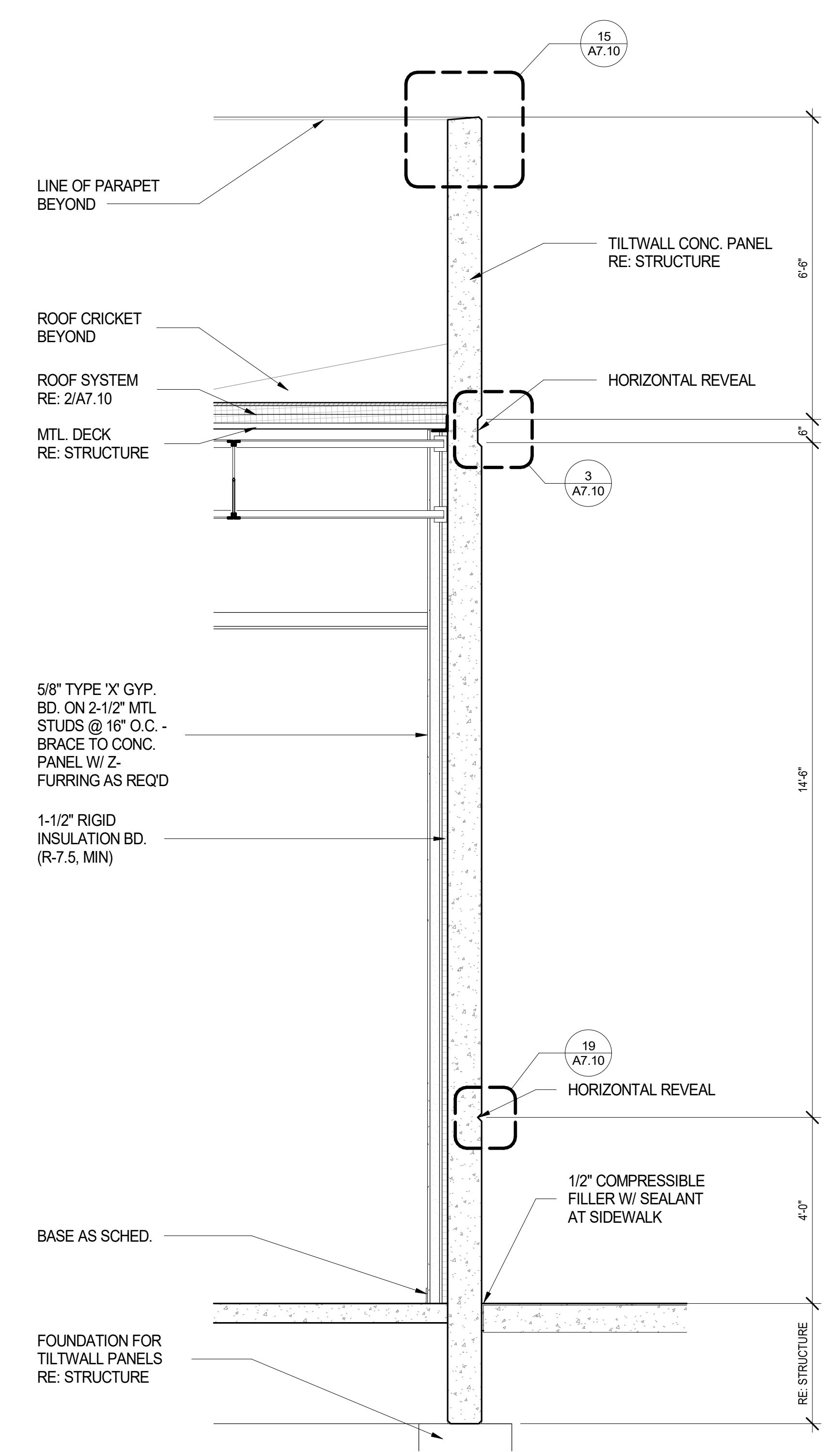
A7.02



**4** TILT WALL BETWEEN ADMIN. & WAREHOUSE  
1/2" = 1'-0"



**3** TILT WALL SECTION AT WAREHOUSE  
1/2" = 1'-0"



**2** TILT WALL SECTION AT WAREHOUSE  
1/2" = 1'-0"



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KEY PLAN  
FLAN NORTH TRUE NORTH

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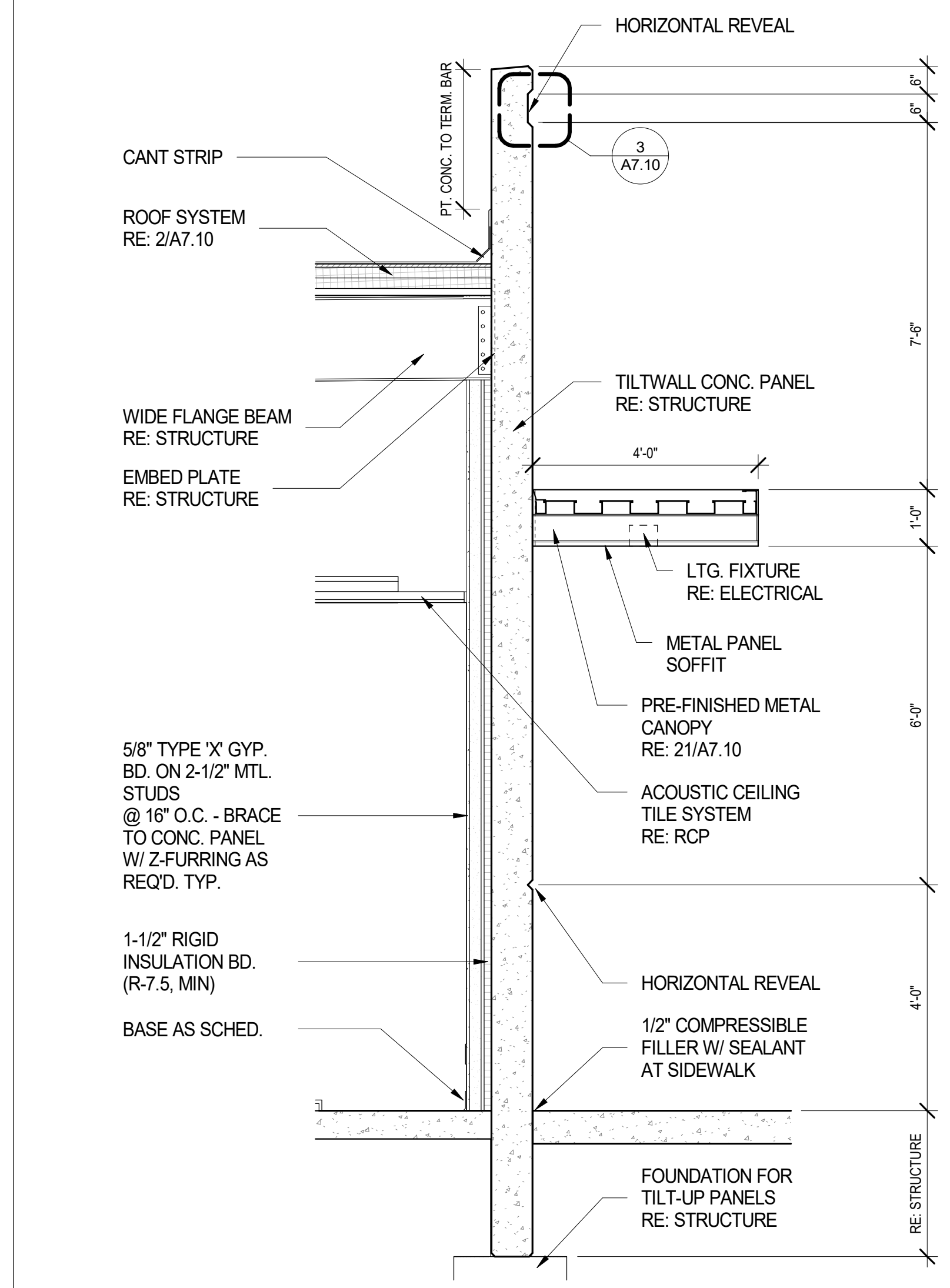
Issue Log		
No.	Description	Date

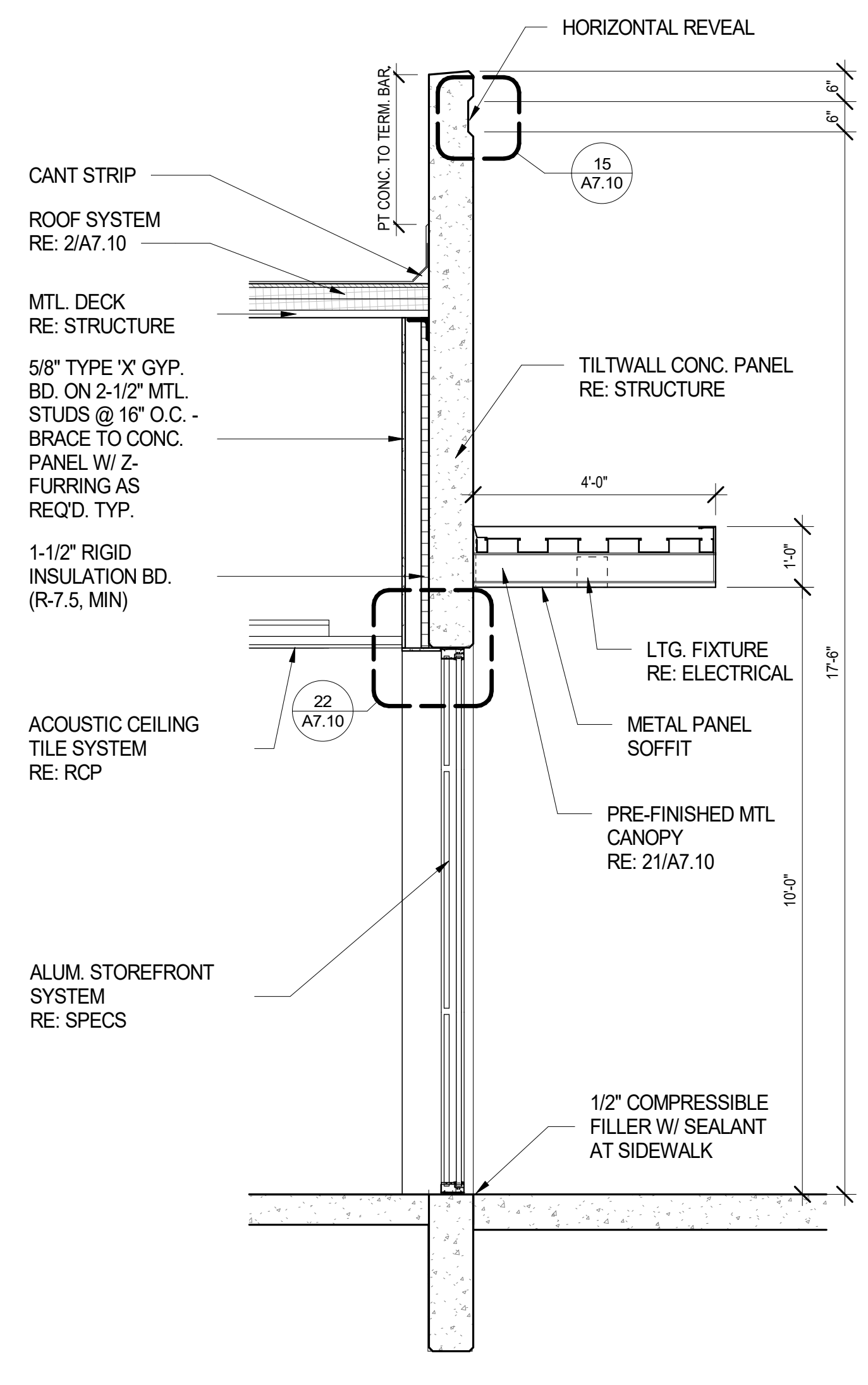
Revisions		
No.	Description	Date

WALL SECTIONS

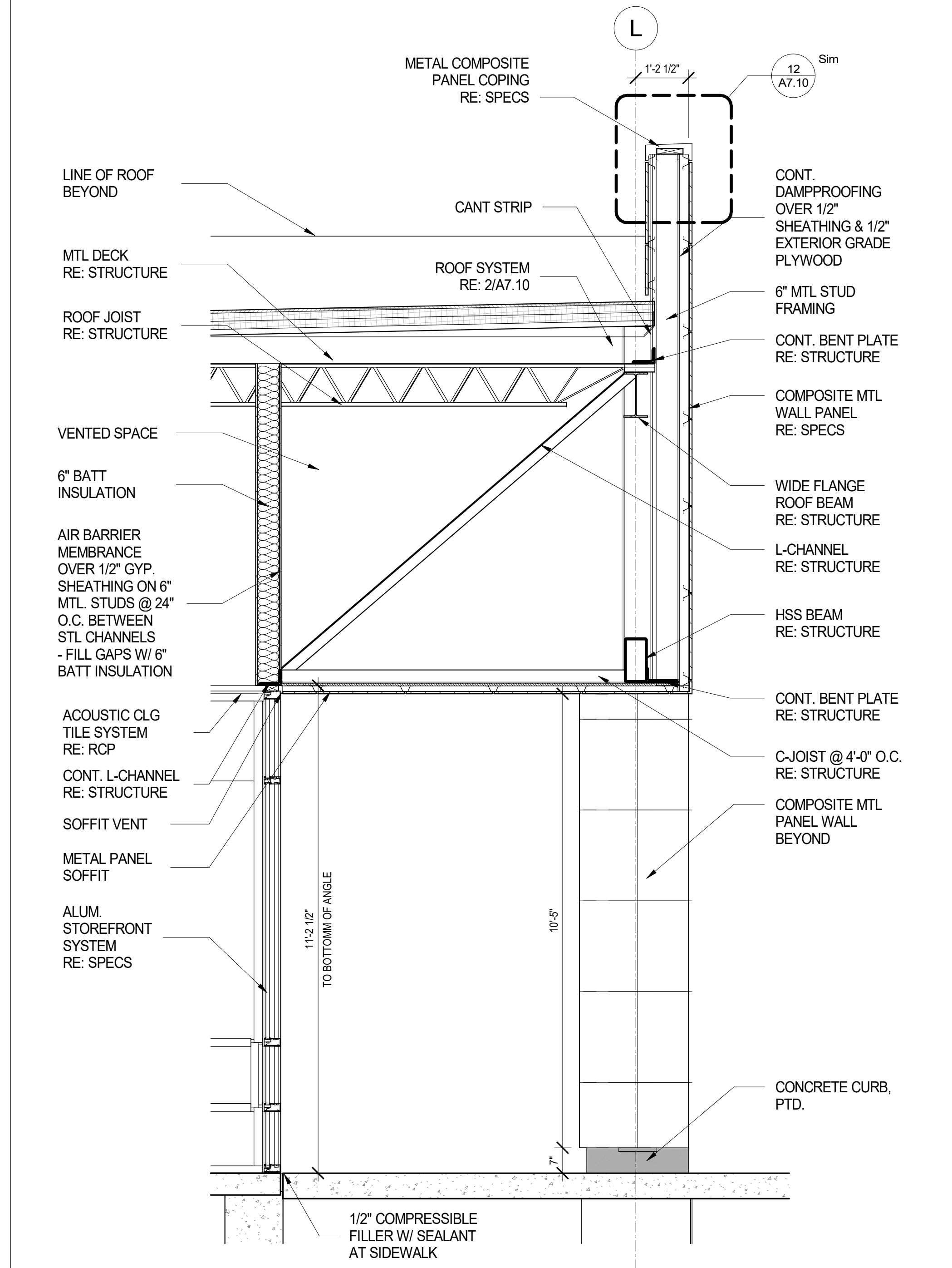
A7.03



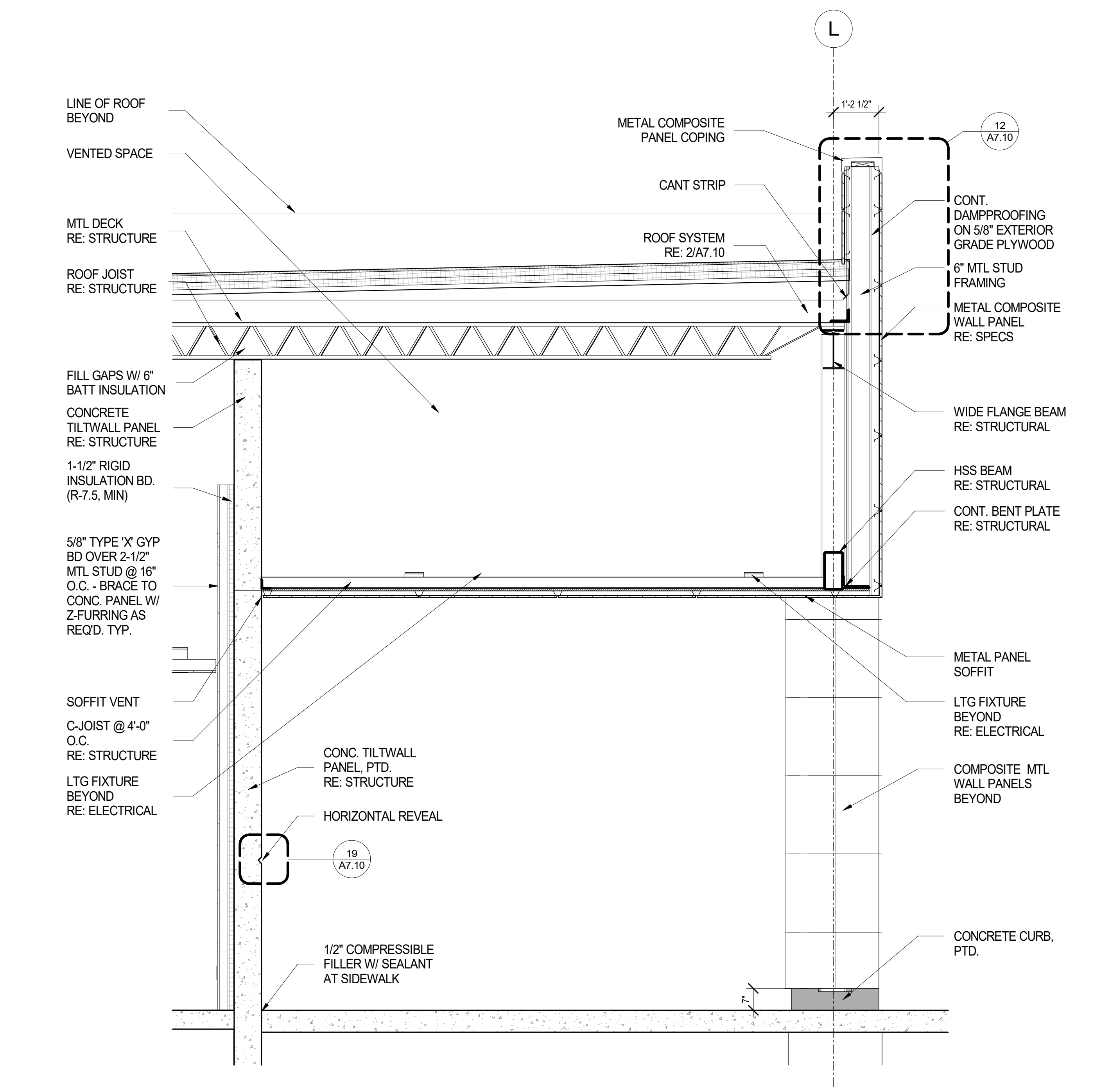
24 TILT WALL AT ADMINISTRATION  
1/2" = 1'-0"



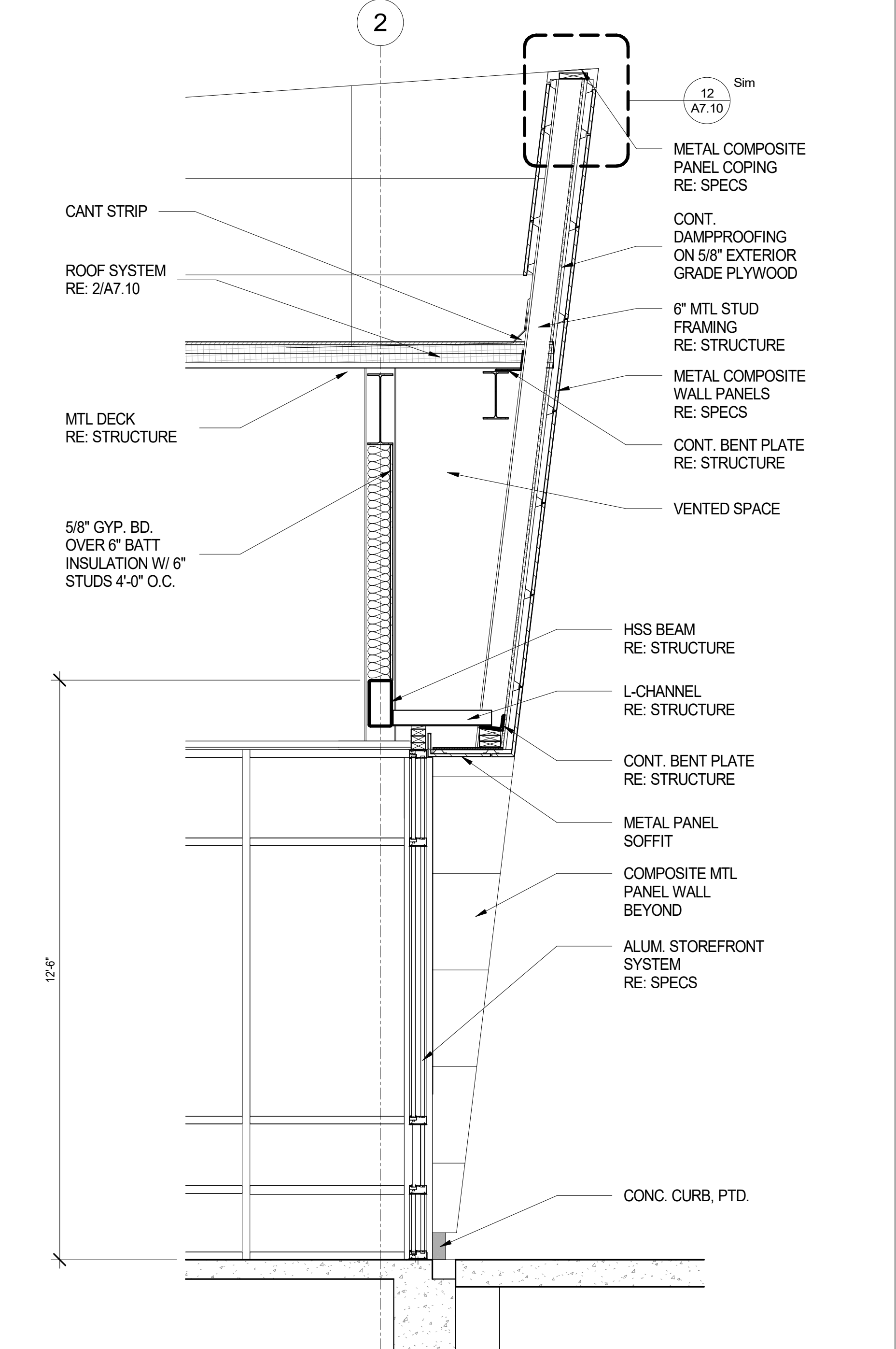
22 TILT WALL AT ADMIN. W/ STOREFRONT & CANOPY  
1/2" = 1'-0"



6 METAL PANEL WALL SECTION  
1/2" = 1'-0"



4 METAL PANEL WALL SECTION  
1/2" = 1'-0"



1 METAL PANEL WALL SECTION  
1/2" = 1'-0"

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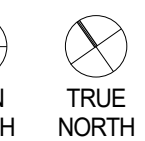
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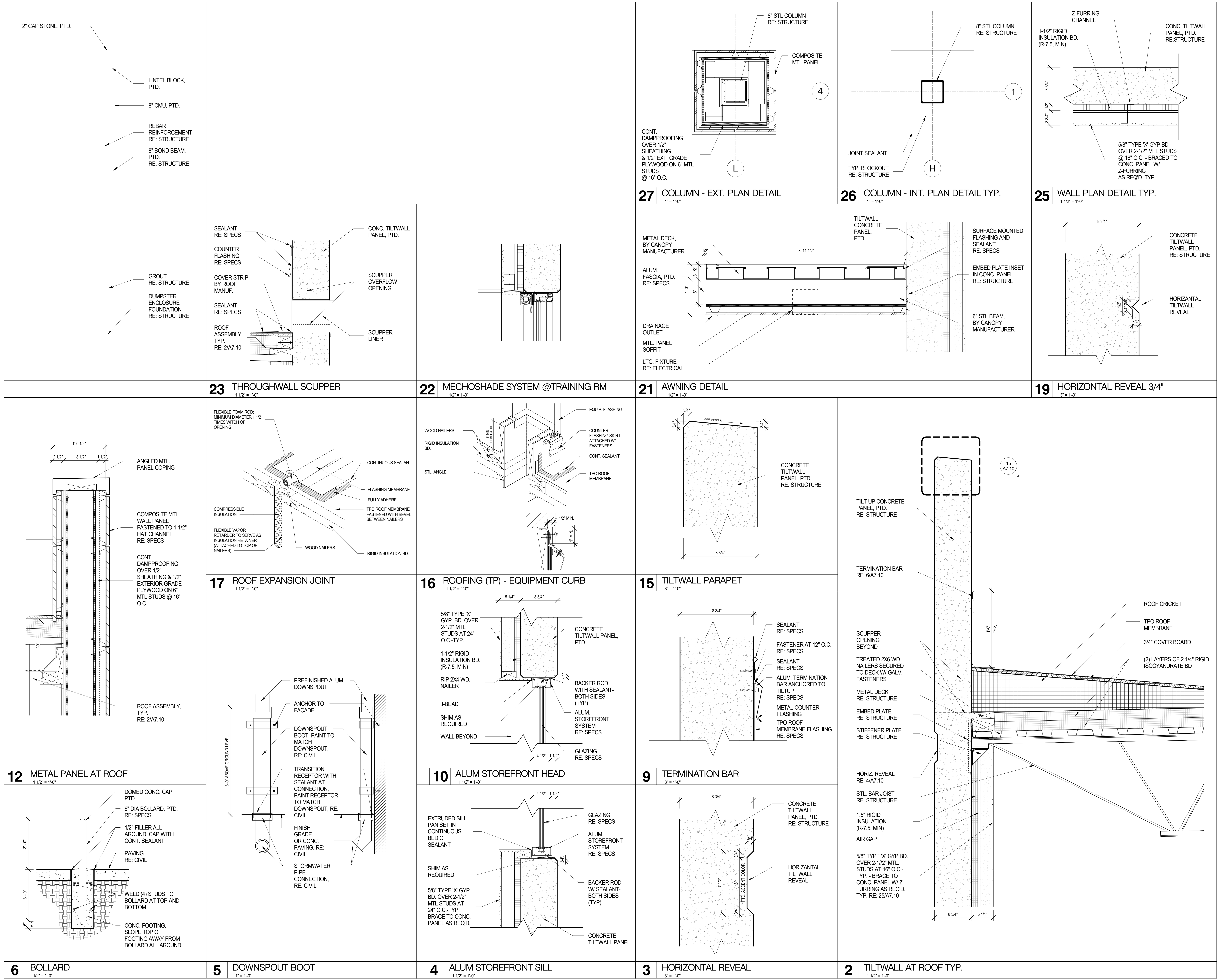
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Revisions:

No.	Description	Date

**WALL SECTIONS  
DETAILS**

**A7.10**



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1/17/2024 4:20:35 PM

GENERAL CASEWORK NOTES

1. BASIS OF DESIGN FOR ALL NON-CASEWORK SHALL BE \_\_\_\_\_ UNO.
2. BASIS OF DESIGN FOR ALL CASEWORK SHALL BE \_\_\_\_\_ UNO.
3. VERIFY ALL CONDITIONS AND CONDITIONS PRIOR TO CASEWORK AND INSTALLATION.
4. VERIFY ALL CONDITIONS AND CONDITIONS PRIOR TO CASEWORK AND INSTALLATION.
5. VERIFY ALL CONDITIONS AND CONDITIONS PRIOR TO CASEWORK AND INSTALLATION.
6. VERIFY ALL CONDITIONS AND CONDITIONS PRIOR TO CASEWORK AND INSTALLATION.
7. ALL CASEWORK SHALL BE INSTALLED IN ACCORDANCE WITH THE UNO.
8. ALL CASEWORK SHALL BE INSTALLED IN ACCORDANCE WITH THE UNO.
9. ALL CASEWORK SHALL BE INSTALLED IN ACCORDANCE WITH THE UNO.
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19. ALL CASEWORK SHALL BE INSTALLED IN ACCORDANCE WITH THE UNO.
20. ALL CASEWORK SHALL BE INSTALLED IN ACCORDANCE WITH THE UNO.



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3700 Bamore Rd. Rosenberg TX, 77471

3700 BAMBOR ROAD  
 ROSENBERG, TX 77471  
 FOR BID AND PERMIT

A	B
---	---

KEY PLAN  

 PLAN NORTH  
 TRUE NORTH

Project No.: 2330

Drawing Date: 12/07/23  
 Drawn: YG  
 Checked: DM  
 Scale: AS NOTED

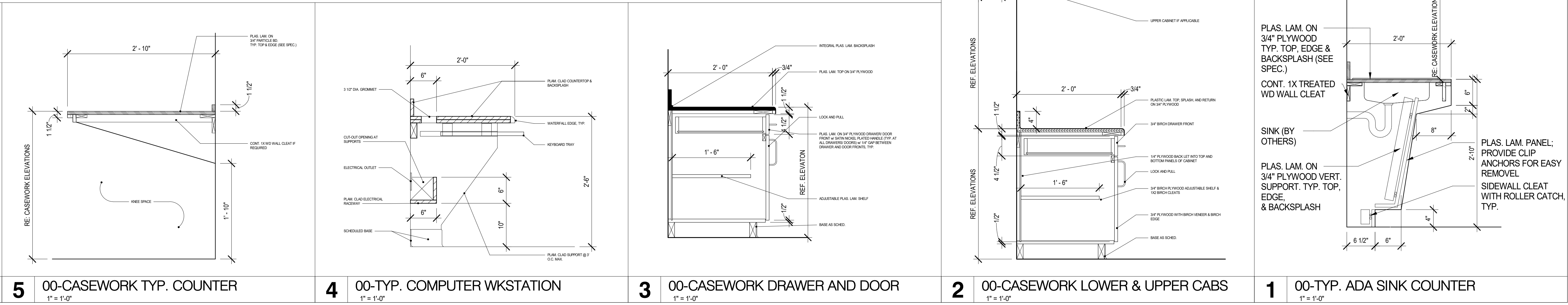
Issue Log		
No.	Description	Date

Revisions:		
No.	Description	Date

CASEWORK SECTIONS

A8.03



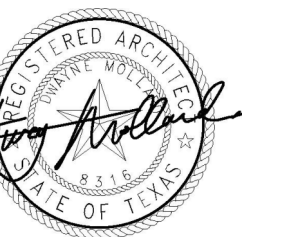
**5** 00-CASEWORK TYP. COUNTER  
 1" = 1'-0"

**4** 00-TYP. COMPUTER WKSTATION  
 1" = 1'-0"

**3** 00-CASEWORK DRAWER AND DOOR  
 1" = 1'-0"

**2** 00-CASEWORK LOWER & UPPER CABS  
 1" = 1'-0"

**1** 00-TYP. ADA SINK COUNTER  
 1" = 1'-0"



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Structural CONSULTANT:  
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MEP CONSULTANT:  
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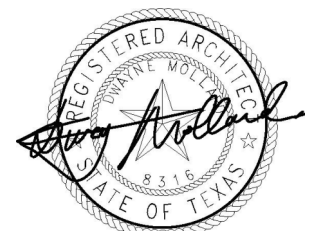
**KEY PLAN** PLAN NORTH TRUE NORTH

Project No.: 2330

Drawing Date: 12/07/23  
Drawn: YG  
Checked: DM  
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Issue Log		
No.	Description	Date

**DOOR, WINDOW  
AND FRAME  
DETAILS -  
INTERIOR  
A9.20**

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A B

KEY PLAN  
PLAN NORTH  
TRUE NORTH

Project No.: 2330

Drawing Date: 12/07/23  
Drawn: YG  
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Issue Log		
No.	Description	Date

Revisions		
No.	Description	Date

**DOOR & WINDOW SCHEDULE**

**A12.01**

DOOR SCHEDULE - ALL - BY TYPE																						
MARK	TYPE	DOOR FRAME				DOOR PANEL				DETAILS		REMARKS										
		MATL	FIN	HT	WT	MATL	FIN	HT	WT	SILL	JAMB		HEAD									
100	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
101	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
102	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
103	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
104	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
105	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
106	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
107	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
108	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
109	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
110	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
111	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
112	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
113	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
114	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
115	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
116	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
117	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
118	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
119	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
120	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
121	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
122	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
123	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
124	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
125	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
126	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
127	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
128	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
129	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
130	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
131	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
132	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
133	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
134	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
135	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
136	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
137	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
138	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
139	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
140	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
141	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
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146	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
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149	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
150	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
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152	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
153	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
154	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
155	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
156	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
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158	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
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160	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
161	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
162	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	
163	SD	FRG	F-P	7'-0"	2'-0"	FRG	F-P	7'-0"	2'-0"	FRG	F-P											





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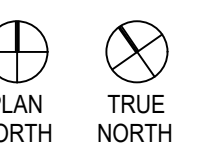
MEP CONSULTANT:  
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410 S Enterprize Pkwy  
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rwheaton@wheaton-ees.com

FBC Elections Administration Building

3700 BAMORE ROAD  
ROSENBERG, TX 77471  
FOR BID AND PERMIT

A B

KEY PLAN



Project No.:

Drawing Date:  
Drawn: C.R.C.  
Checked: R.B.W.  
Scale: AS NOTED

Issue Log:

No.	Descriptor	Date

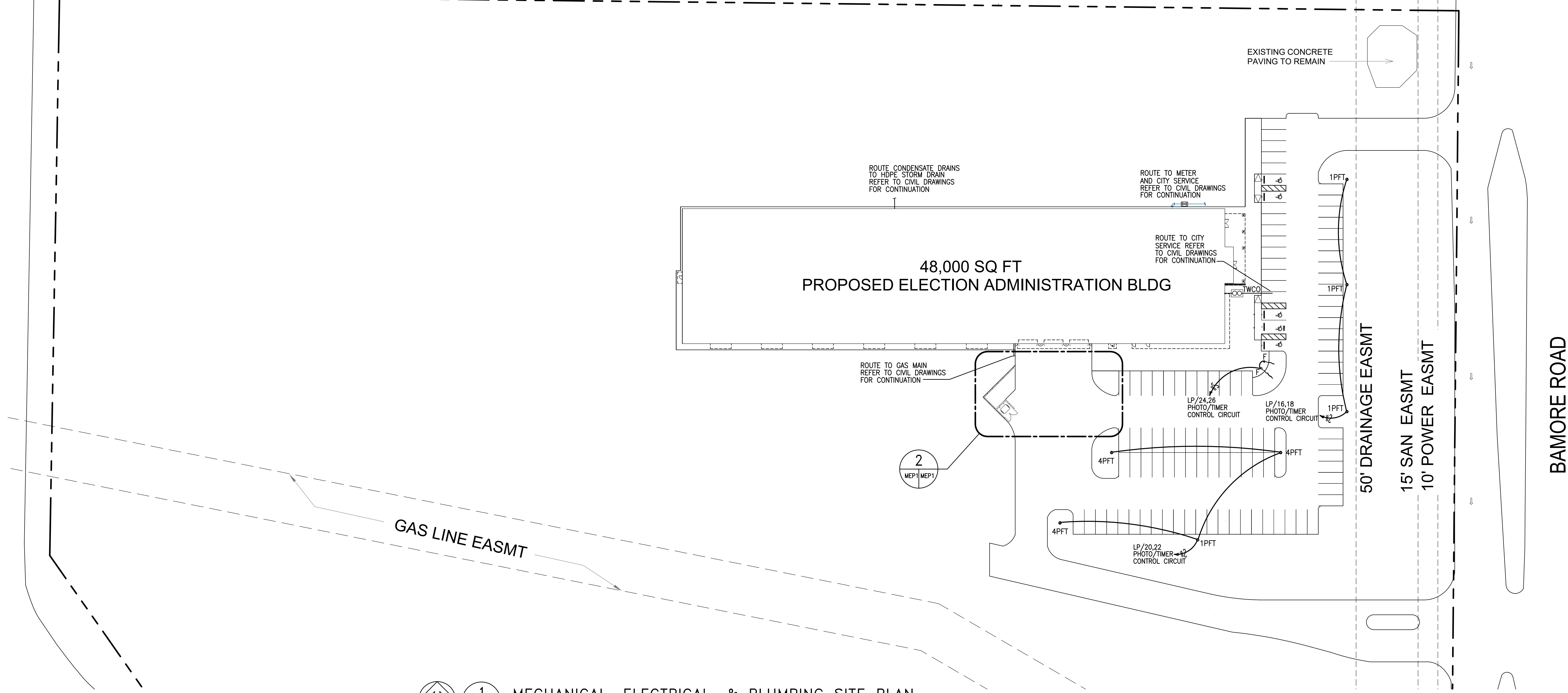
Revisions:

No.	Description	Date

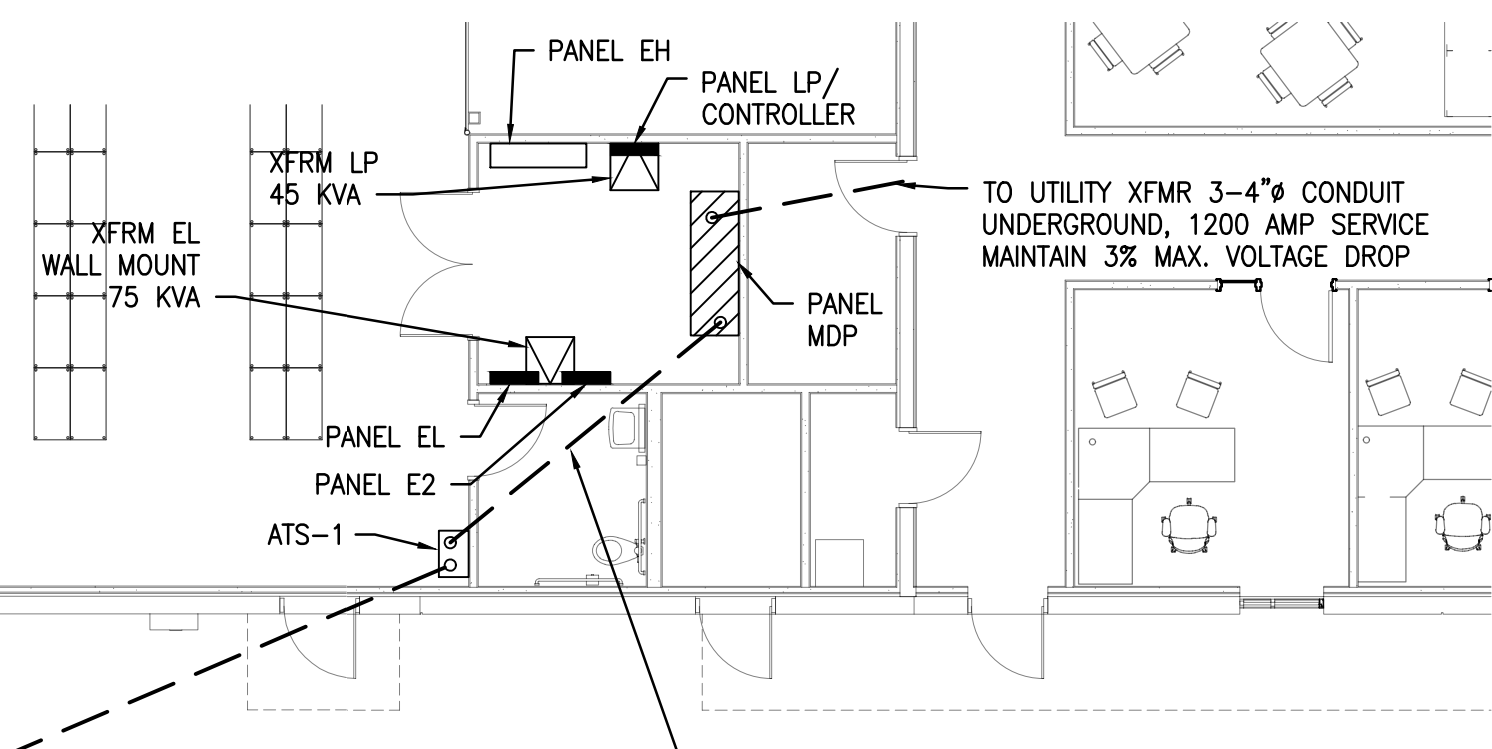
MECHANICAL  
ELECTRICAL PLUMBING  
SITE PLAN

**MEP1.0**

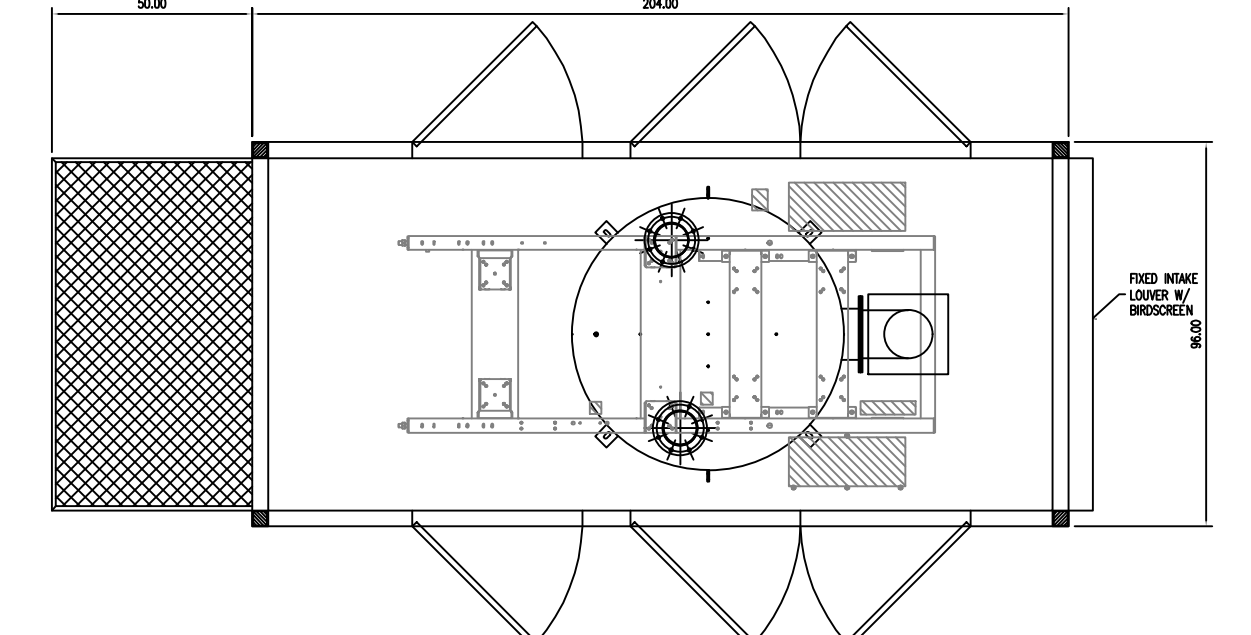
48,000 SQ FT  
PROPOSED ELECTION ADMINISTRATION BLDG



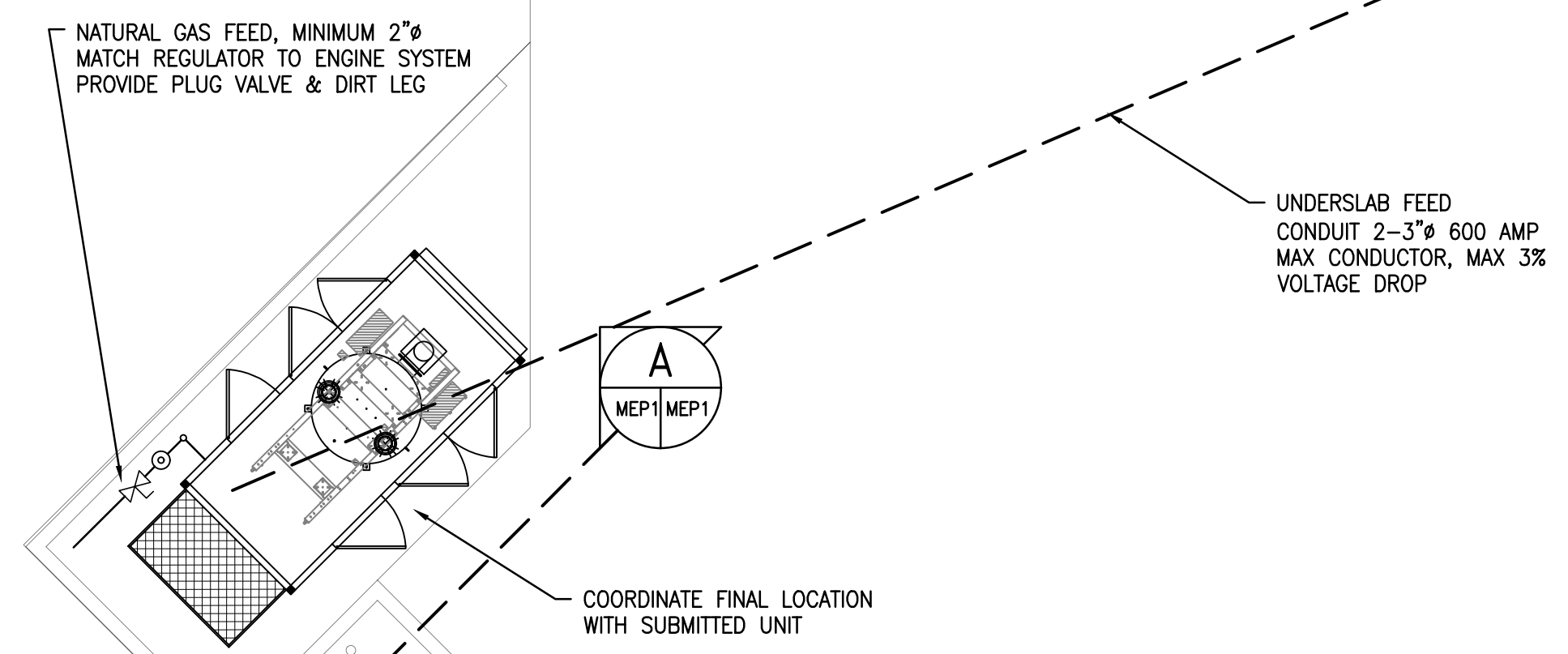
**1 MECHANICAL, ELECTRICAL, & PLUMBING SITE PLAN**  
SCALE: 1/4"=1'-0"



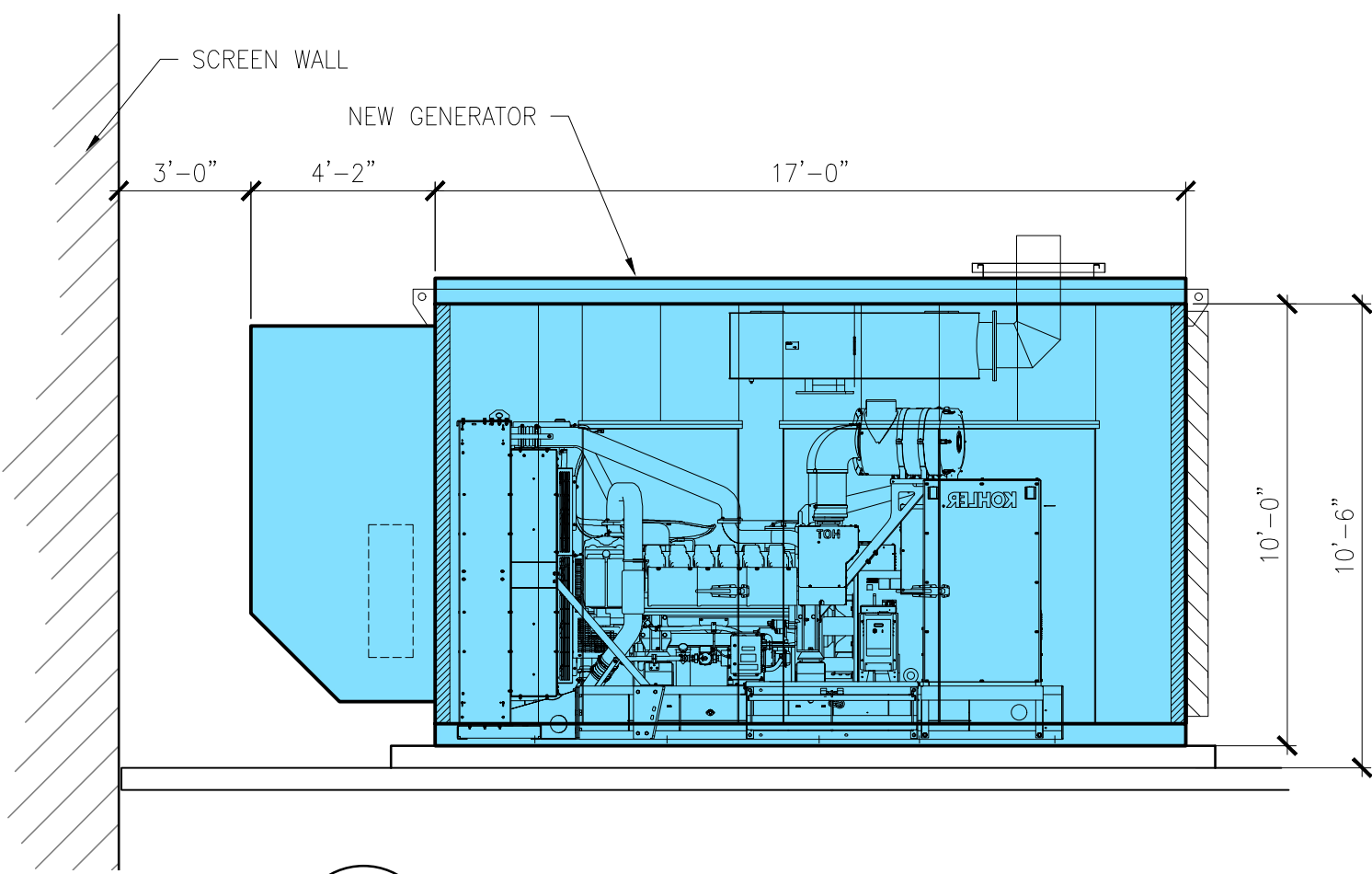
**NOTES:**  
ENCLOSURE ASSEMBLY:  
FOR A KRIEGER 40500 NATURAL GAS FUELED FULLY ASSEMBLED DROP OVER ENCLOSURE WELDED TO I-BEAM FRAME WALL PANELS ARE BOLTED TOGETHER AND CAULKED  
ENCLOSURE CONSTRUCTION:  
WALLS - 14 GAUGE GALVANEAL PANELS  
ROOF - 14 GAUGE GALVANEAL PANELS  
ENCLOSURE FRAME - 6"X6" I-BEAM  
DOORS - 1 DOUBLE DOOR, 1 SINGLE DOOR (EA. SIDE) W/ROLLED ON HINGES AND FREEZER LATCHES W/INSIDE RELEASE  
LOWERS - 14 GAUGE GALVANEAL FIXED LOWERS ON INTAKE SIDE. GRAVITY DAMPERS ON EXHAUST SIDE.  
PAINTING:  
ALL EXTERIOR PANELS TO BE D.A. AND WIPED DOWN WITH SOLVENT PRIMER WITH PPC APOXY PRIMER  
PAINTED WITH PPC POLYURETHANE ALU100  
COLOR - PAINTED TO CUSTOMER REQUEST  
ENCLOSURE DIMENSIONS:  
ENCLOSURE - 204"L X 96"W X 108"H (280" OVERALL LENGTH w/SCOPD)  
ENCLOSURE WEIGHT - 5,000lbs



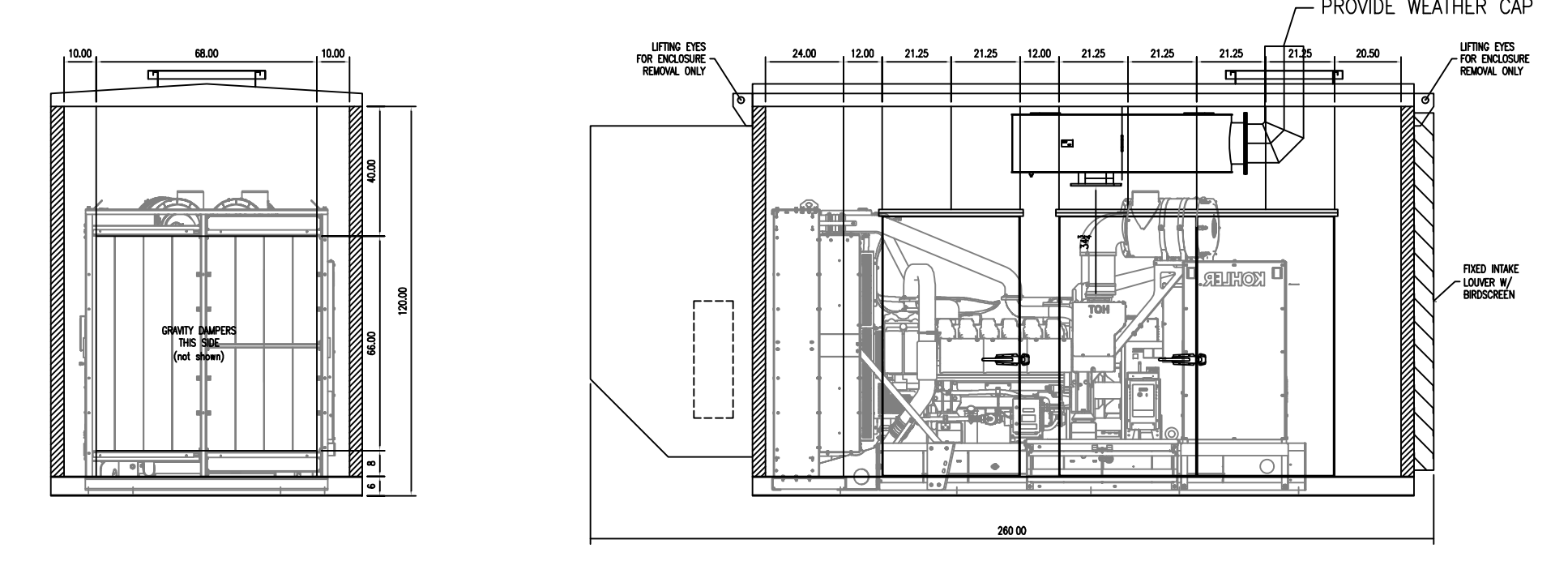
**3 GENERATOR PLAN**  
SCALE: 1/4"=1'-0"



**2 GENERATOR YARD PLAN**  
SCALE: 1/8"=1'-0"

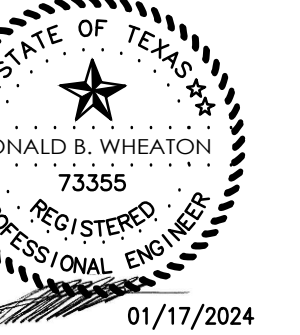


**A GENERATOR SECTION & PAD**  
SCALE: 1/4"=1'-0"



**4 GENERATOR ELEVATIONS**  
SCALE: 1/4"=1'-0"





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A B

KEY PLAN  
⊕ PLAN NORTH  
⊗ TRUE NORTH

Project No.:

Drawing Date: .  
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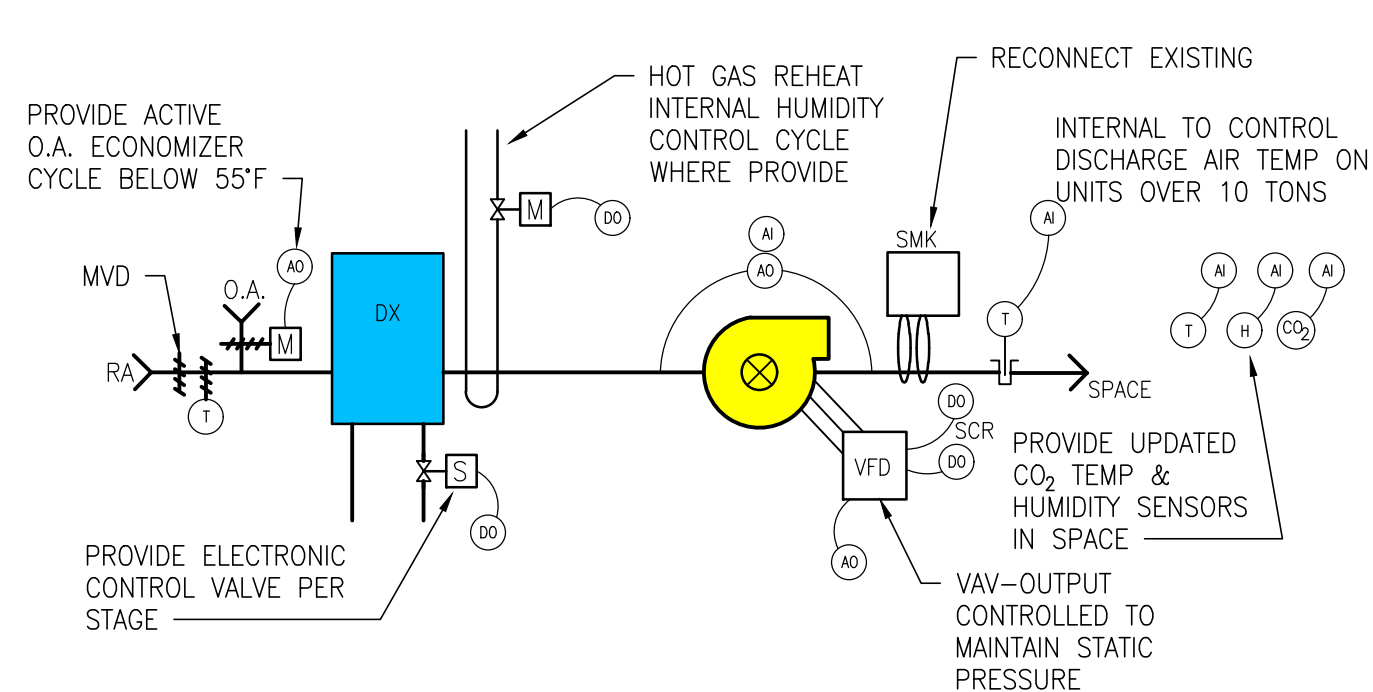
Issue Log:

No.	Descriptor	Date

Revisions:

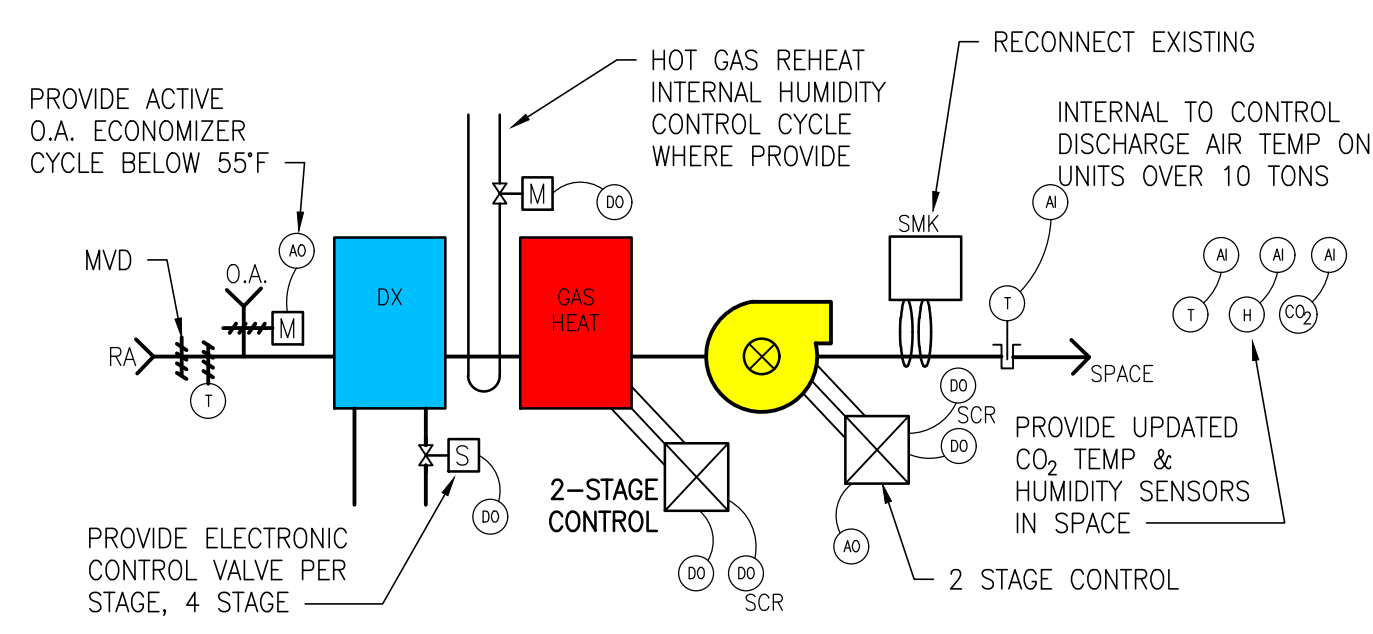
No.	Description	Date

MECHANICAL  
PLAN  
ADMINISTRATION  
**M1.0**



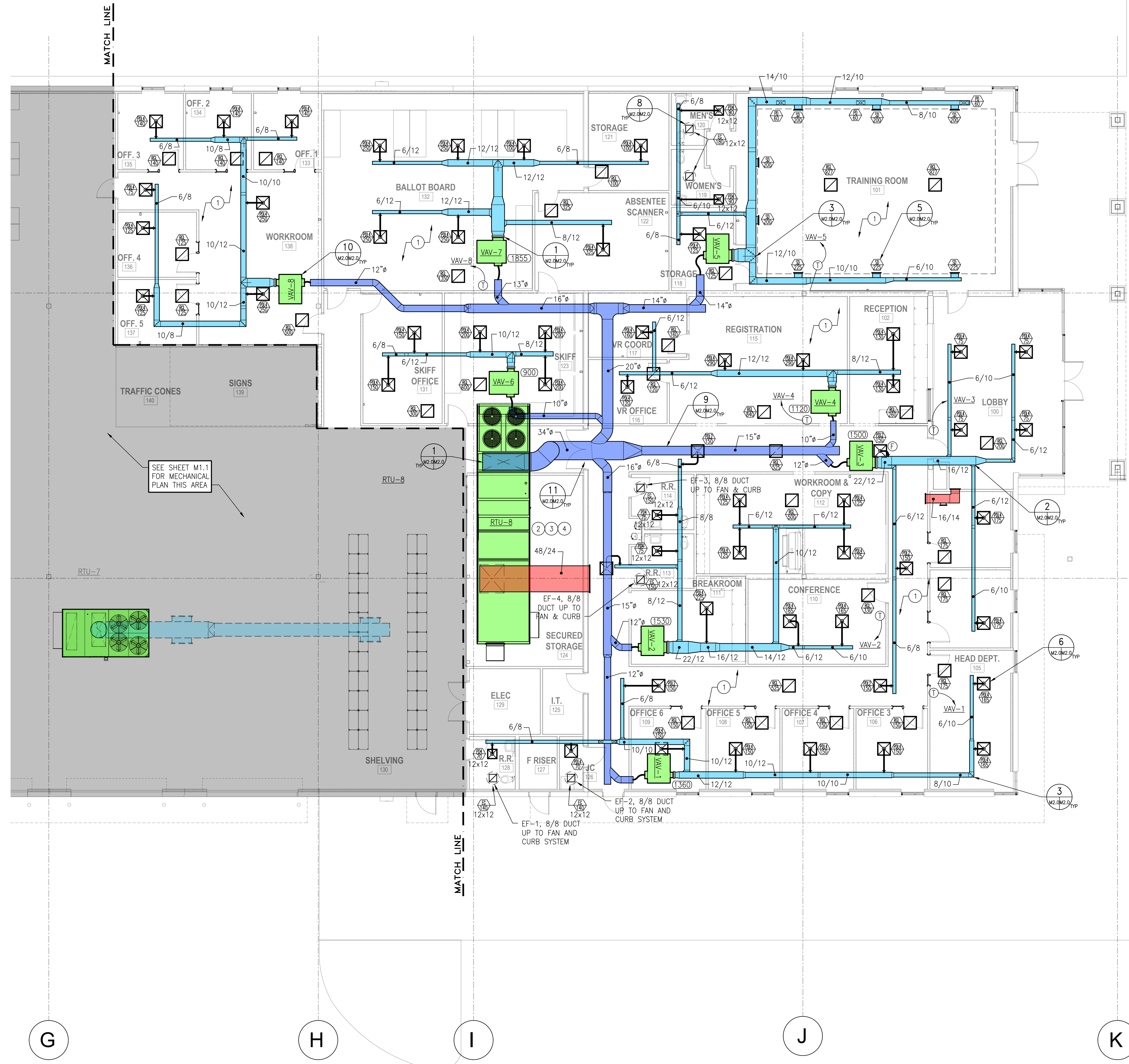
1. COOLING FAN CYCLE "ON-VAV" OPEN O.A. DAMPER ONLY WHEN COMPRESSORS ARE OPERATIONAL. PROVIDE VARIABLE VOLUME OUTPUT SPACE SENSOR CONTROL PER ASHRAE 90.1, PROVIDE CONSTANT TEMPERATURE DISCHARGE.
2. PROVIDE DEHUMIDIFICATION CYCLE, FAN "ON" COIL STAGED, HOT GAS REHEAT TO MAINTAIN SPACE HUMIDITY WHERE AVAILABLE.
3. PROVIDE DDC SYSTEM INTERFACE TO MOD-BUS FOR AUTOMATED LOGIC.
4. PROVIDE NEW ACTUATORS AND PROGRAMING AS INDICATED.
5. RUN ALL FANS CONTINUOUSLY AT 80% AND RECORD CO2 LEVELS. OPEN O.A. DAMPER AND RESET TEMPERATURE TO 68°F WHEN CO2 EXCEEDS 900PPM, RETURN TO NORMAL @ 600PPM. COILING/COMPRESSOR SHALL REMAIN ON WITH HOT GAS REHEAT. WHERE AVAILABLE PROGRAMMING SHALL NOT ALLOW UNTREATED AIR TO ENTER THE BUILDING.

**2** DIAGRAM - CONTROLS, RTU-8  
M1.0 M1.0 NOT TO SCALE



1. COOLING FAN CYCLE "ON" OPEN O.A. DAMPER ONLY WHEN COMPRESSORS ARE OPERATIONAL. UNITS LESS THAN 10 TONS CYCLE COIL TO MAINTAIN 74" ± 2" SPACE. PROVIDE VARIABLE VOLUME OUTPUT SPACE SENSOR CONTROL ON UNITS 10 TONS AND UP PER ASHRAE 90.1
2. HEATING FAN "ON" 80% CYCLE GAS HEAT TO MAINTAIN 70" ± 2".
3. PROVIDE AUTOMATIC HEAT-COOL CHANGE OVER WITH MINIMUM 4°F DEAD BAND.
4. PROVIDE DEHUMIDIFICATION CYCLE, FAN "ON" COIL STAGED, HOT GAS REHEAT TO MAINTAIN SPACE TEMP WHERE AVAILABLE.
5. PROVIDE DDC SYSTEM INTERFACE TO MOD-BUS FOR AUTOMATED LOGIC.
6. PROVIDE NEW ACTUATORS AND PROGRAMING AS INDICATED.
7. RUN ALL FANS CONTINUOUSLY AND RECORD CO2 LEVELS. OPEN O.A. DAMPER AND RESET TEMPERATURE TO 68°F WHEN CO2 EXCEEDS 900PPM, RETURN TO NORMAL @ 600PPM. COILING/COMPRESSOR SHALL REMAIN ON WITH HOT GAS REHEAT. WHERE AVAILABLE PROGRAMMING SHALL NOT ALLOW UNTREATED AIR TO ENTER THE BUILDING.

**3** DIAGRAM - CONTROLS, RTU 1-7  
M1.0 M1.0 NOT TO SCALE



**1** MECHANICAL PLAN - ADMINISTRATION  
M1.0 M1.0 SCALE: 1/8"=1'-0"

- KEY NOTES:
1. OPEN PLENUM RETURN, PROVIDE PASS THROUGH FOR RETURN AIR WHERE REQUIRED.
  2. PROVIDE MANUFACTURER COMPLETE CURB SYSTEM FASTENED DIRECTLY TO BUILDING STRUCTURE, REFER TO STRUCTURAL PLANS FOR ANCHOR POINTS. PROVIDE A MINIMUM OF (6) 6"x14GA TIE DOWN STRAPS. SEE DETAIL 5 ON SHEET M1.2.
  3. PROVIDE CONDENSATE DRAINS, COPPER TYPE "L", ROUTE TO DRAINS SHOWN ON PLUMBING PLANS.
  4. PROVIDE DDC CONTROL PER DIAGRAMS, SEE DETAILS ON MEET M1.0.



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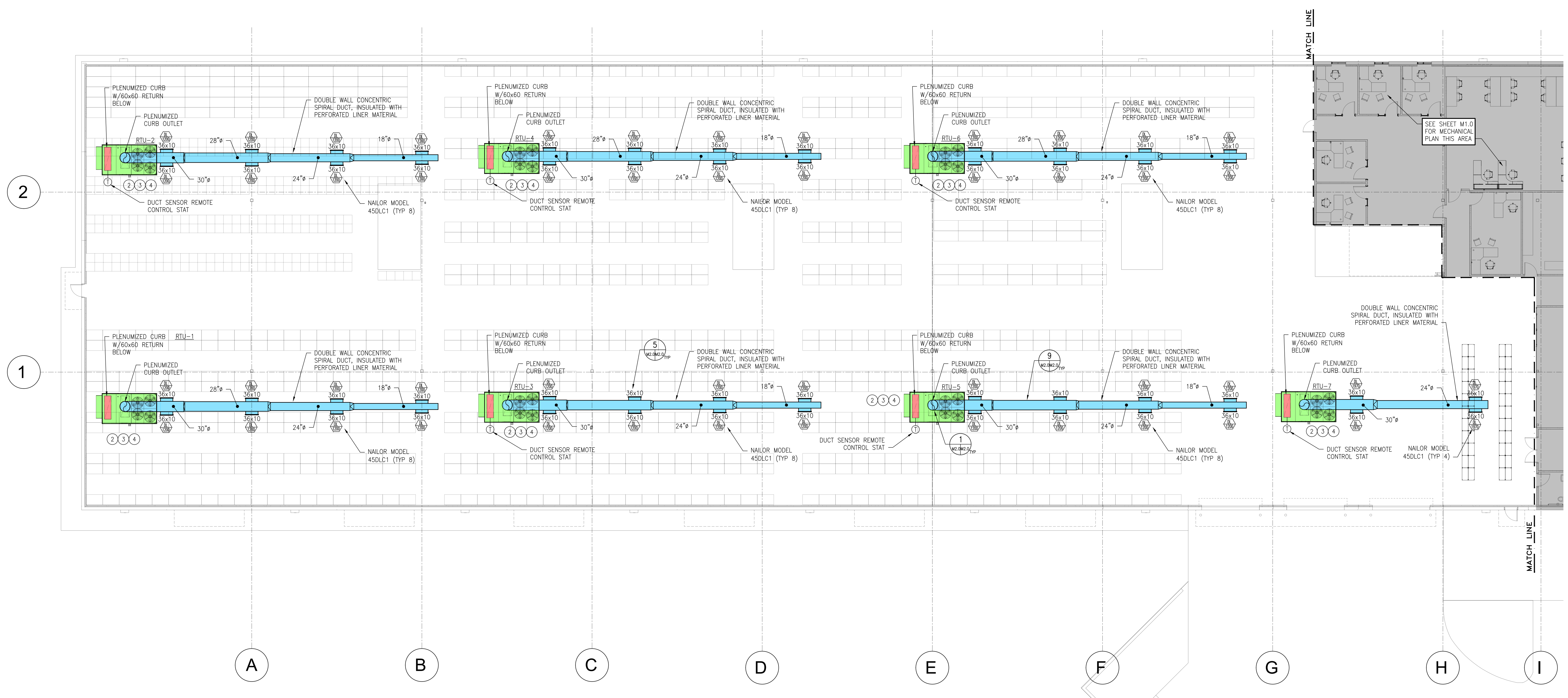
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**1**  
MECHANICAL PLAN – WAREHOUSE  
SCALE: 3/32" = 1'-0"

- KEY NOTES:
1. OPEN PLENUM RETURN, PROVIDE PASS THROUGH FOR RETURN AIR WHERE REQUIRED.
  2. PROVIDE MANUFACTURER COMPLETE CURB SYSTEM FASTENED DIRECTLY TO BUILDING STRUCTURE, REFER TO STRUCTURAL PLANS FOR ANCHOR POINTS, PROVIDE A MINIMUM OF (6) 6"x14GA TIE DOWN STRAPS. SEE DETAIL 5 ON SHEET M1.2.
  3. PROVIDE CONDENSATE DRAINS, COPPER TYPE "L", ROUTE TO DRAINS SHOWN ON PLUMBING PLANS.
  4. PROVIDE DDC CONTROL PER DIAGRAMS, SEE DETAILS ON MEET M1.0.



KEY PLAN  
PLAN NORTH  
TRUE NORTH

Project No.:  
Drawing Date:  
Drawn: C.R.C.  
Checked: R.B.W.  
Scale: AS NOTED

Issue Log:

No.	Descriptor	Date

Revisions:

No.	Description	Date

**MECHANICAL PLAN  
WAREHOUSE  
M1.1**



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KEY PLAN  
⊕ PLAN NORTH  
⊗ TRUE NORTH

Project No.:

Drawing Date: .  
Drawn: C.R.C.  
Checked: R.B.W.  
Scale: AS NOTED

Issue Log:

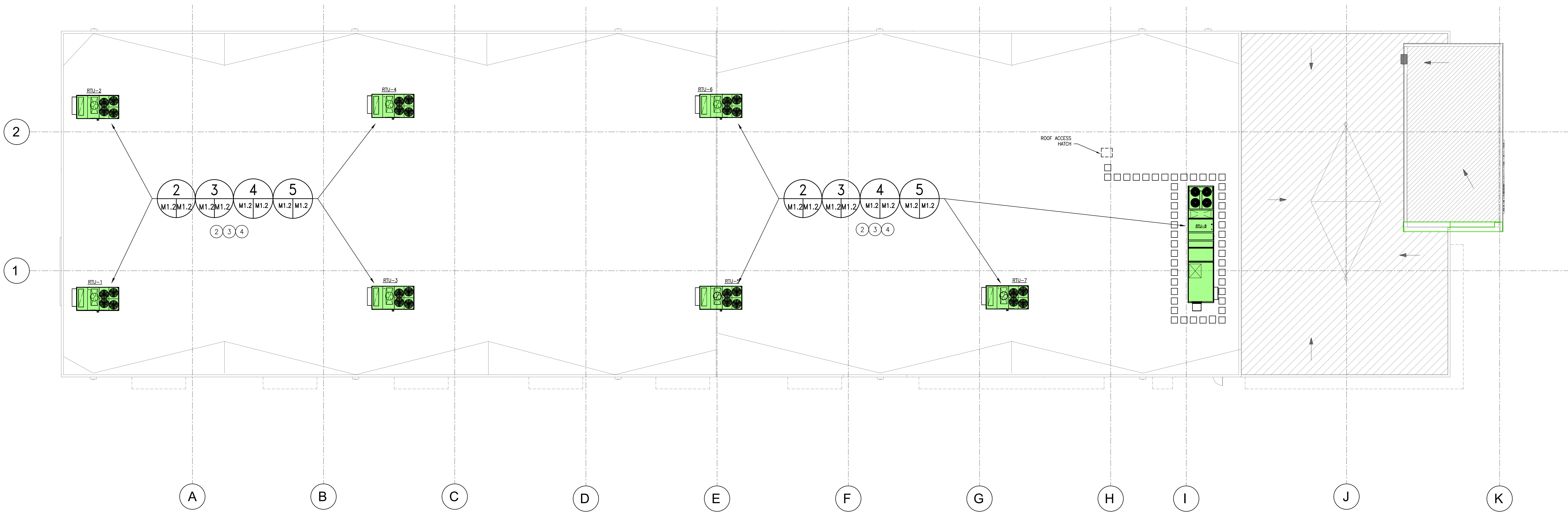
No.	Descriptor	Date

Revisions:

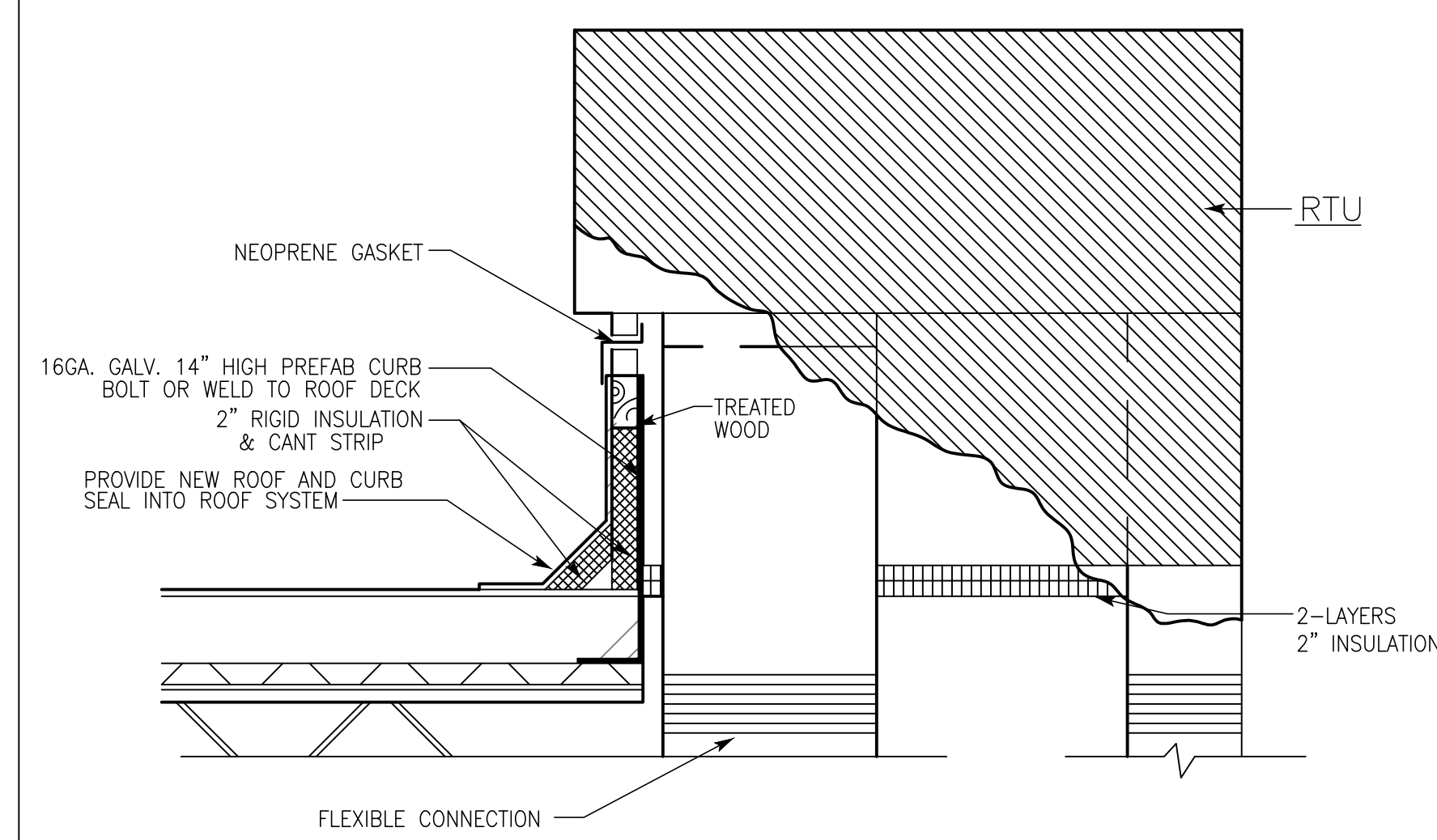
No.	Description	Date

MECHANICAL  
ROOF PLAN

M1.2



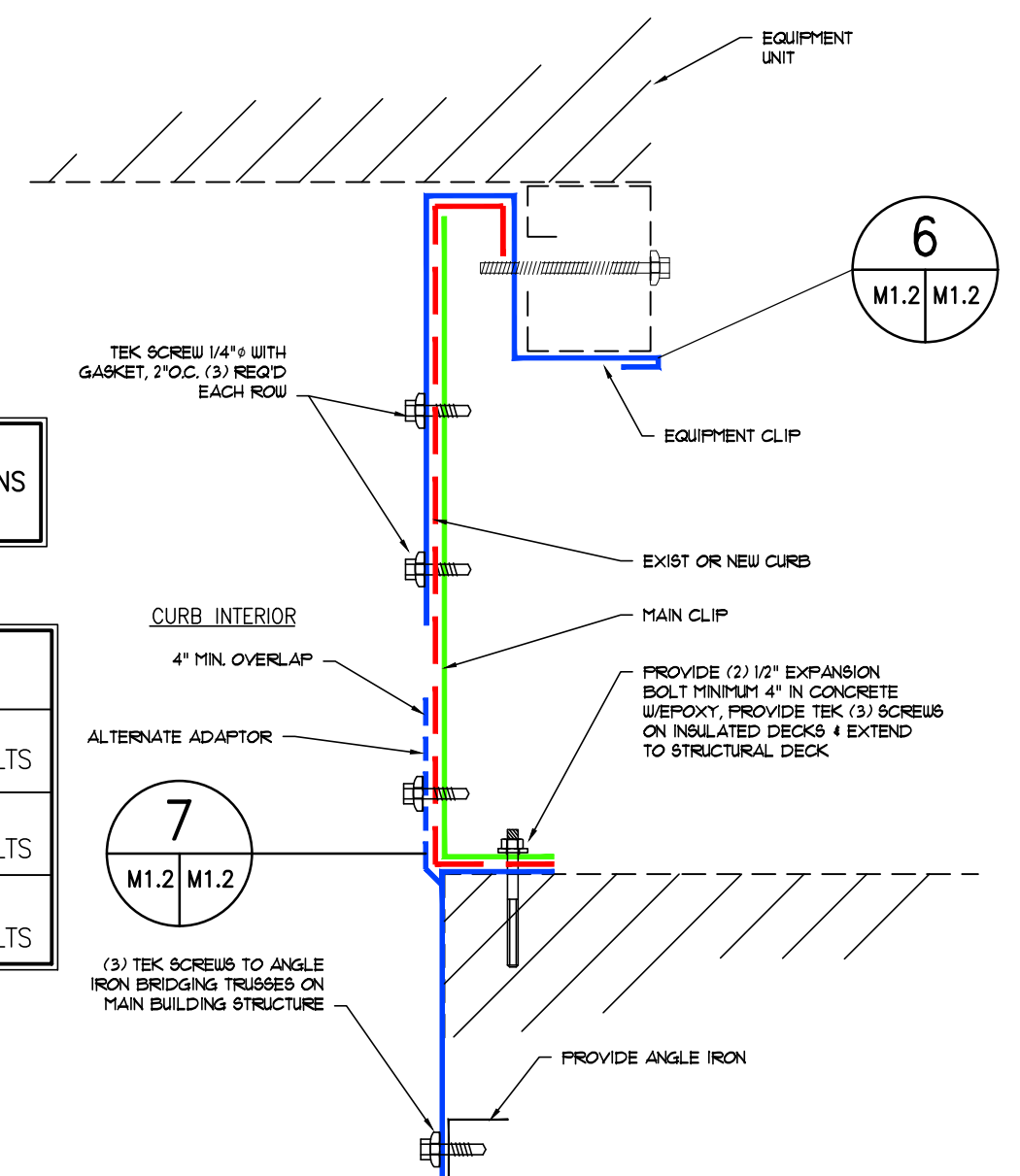
**1 MECHANICAL ROOF PLAN**  
SCALE: 1/16" = 1'-0"



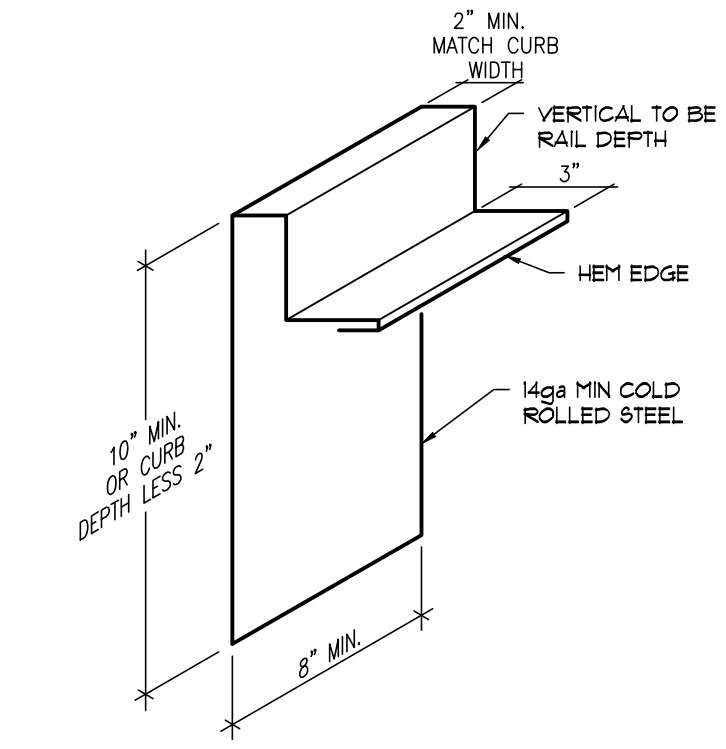
**2 DETAIL - ROOFTOP UNIT CURB**  
NOT TO SCALE

CONTRACTOR SHALL PROVIDE ALL WINDSTORM CERTIFICATES, INSPECTIONS AND STRUCTURAL ENGINEERING

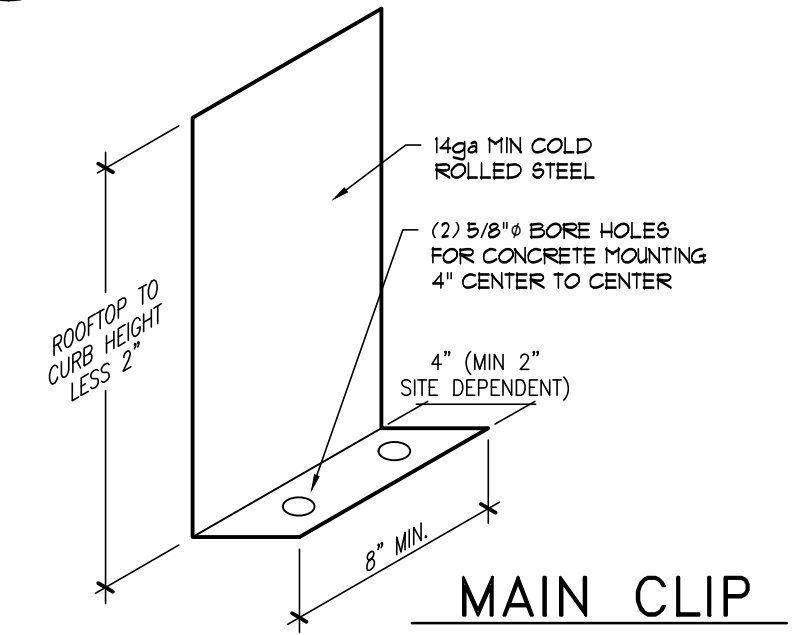
BRIDGE LENGTH	ANGLE IRON	ANCHOR
0-4'	3x3x3/16"	(2) 5/8" BOLTS
4'-6'	4x4x5/16"	(2) 3/4" BOLTS
6'-10'	6x6x1/2"	(4) 3/4" BOLTS



**4 DETAIL - UNIT DIRECTLY TO CURB**  
NOT TO SCALE

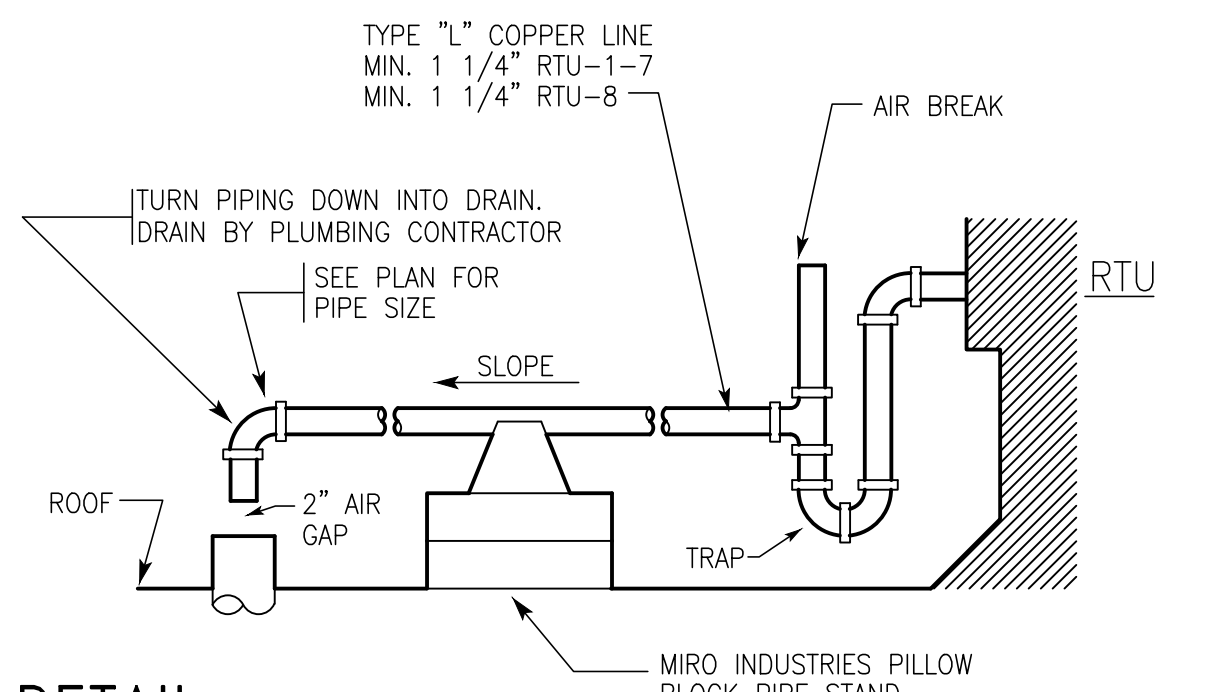


**6 EQUIPMENT CLIP**  
NOT TO SCALE

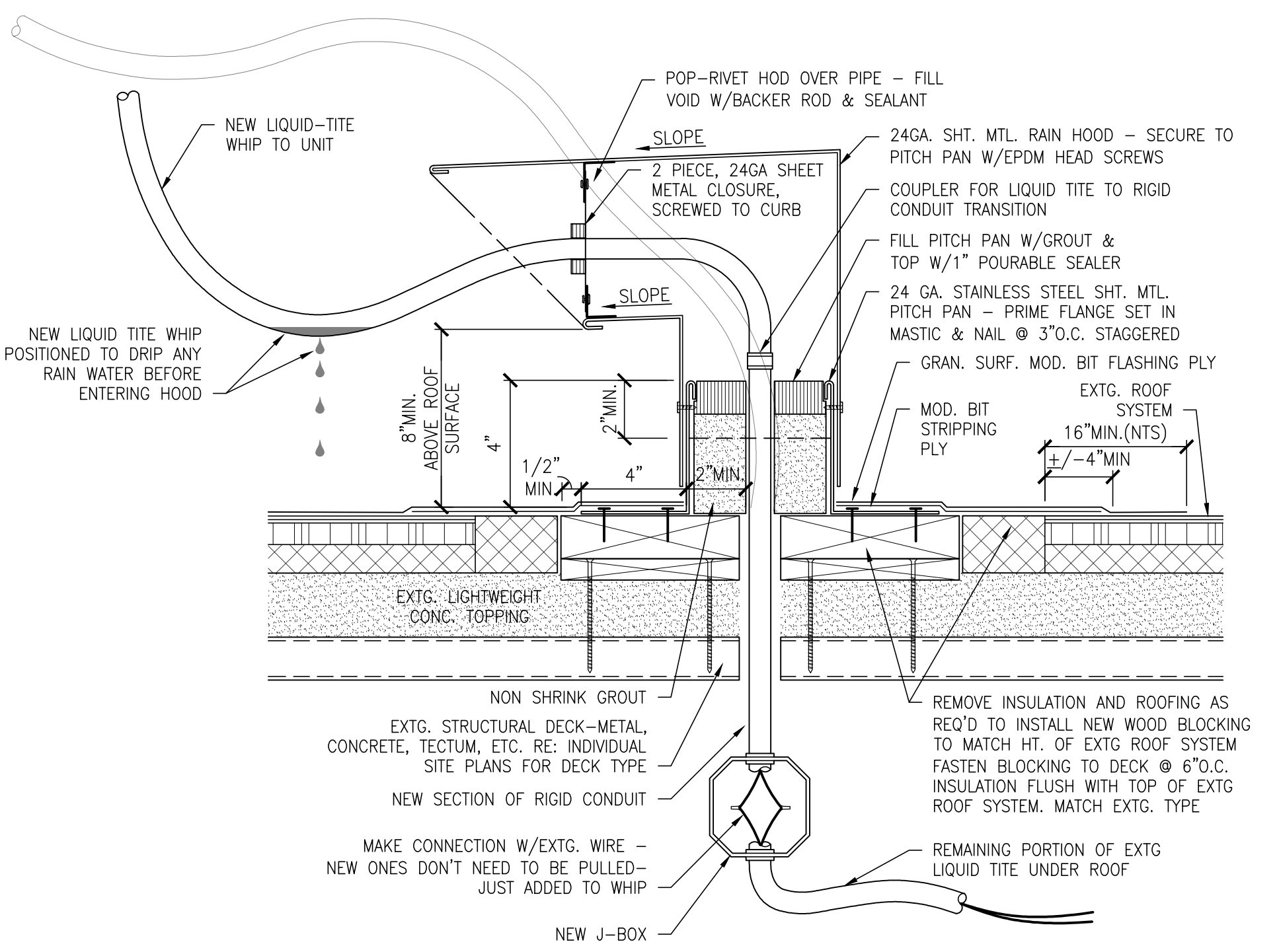


**7 CLIP DETAILS**  
NOT TO SCALE

- KEY NOTES:
- OPEN PLENUM RETURN, PROVIDE PASS THROUGH FOR RETURN AIR WHERE REQUIRED.
  - PROVIDE MANUFACTURER COMPLETE CURB SYSTEM FASTENED DIRECTLY TO BUILDING STRUCTURE. REFER TO STRUCTURAL PLANS FOR ANCHOR POINTS. PROVIDE A MINIMUM OF (6) 6"x14GA TIE DOWN STRAPS. SEE DETAIL 5 ON SHEET M1.2.
  - PROVIDE CONDENSATE DRAINS, COPPER TYPE "L", ROUTE TO DRAINS SHOWN ON PLUMBING PLANS.
  - PROVIDE DDC CONTROL PER DIAGRAMS, SEE DETAILS ON MEET M1.0.



**3 DETAIL ROOF TOP UNIT CONDENSATE DRAIN**  
NOT TO SCALE



**5 HOODED PITCH PAN W/ J-BOX CONNECTION**  
SCALE: 3" = 1' - 0"



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MARK	PRIMARY AIR			FAN SECTION										ELECTRIC HEATER					FILTER			MANUFACTURER & MODEL
	CFM	MIN. INLET S.P. IN H2O	INLET SIZE INCH Ø	MAX. C.F.M.	S.P. IN W.G.	FAN SPEED	EST. FAN EFF.	MIN MOTOR H.P.	VOLTAGE	PHASE	HERTZ	TEMP RISE ΔT	CAPACITY BTU/HR.	KW	AMPS	VOLTAGE	PHASE	HERTZ	MIN AREA FT²	TYPE		
VAV-1	1360	1.0	1832	1.0	35.0%	3/4	480	3	60	25	45196.49	13.24	22.30	480.0	3.0	60.0	2.72	SERIES	YORK			
VAV-2	1530	1.0	1836	1.0	35.0%	5/8	480	3	60	25	50846.06	14.90	25.09	480.0	3.0	60.0	3.08	SERIES	YORK			
VAV-3	1500	1.0	1800	1.0	35.0%	4/5	480	3	60	25	49849.07	14.61	24.60	480.0	3.0	60.0	3.00	SERIES	YORK			
VAV-4	1120	1.0	1344	1.0	35.0%	3/5	480	3	60	25	37220.64	10.91	18.36	480.0	3.0	60.0	2.24	SERIES	YORK			
VAV-5	2160	1.0	2592	1.0	35.0%	1 1/8	480	3	60	25	71782.87	21.03	35.42	480.0	3.0	60.0	4.32	SERIES	YORK			
VAV-6	900	1.0	1080	1.0	35.0%	1/2	480	3	60	25	22909.44	6.76	14.76	480.0	3.0	60.0	1.80	SERIES	YORK			
VAV-7	1855	1.0	2226	1.0	35.0%	1	480	3	60	25	61646.69	18.06	30.42	480.0	3.0	60.0	3.71	SERIES	YORK			
VAV-8	1245	1.0	1494	1.0	35.0%	2/3	480	3	60	25	41374.73	12.12	20.41	480.0	3.0	60.0	2.49	SERIES	YORK			
TOTALS	11670	1.0	14004	#DIV/0!	0.4	6.30					387825.80	113.63						23.34				

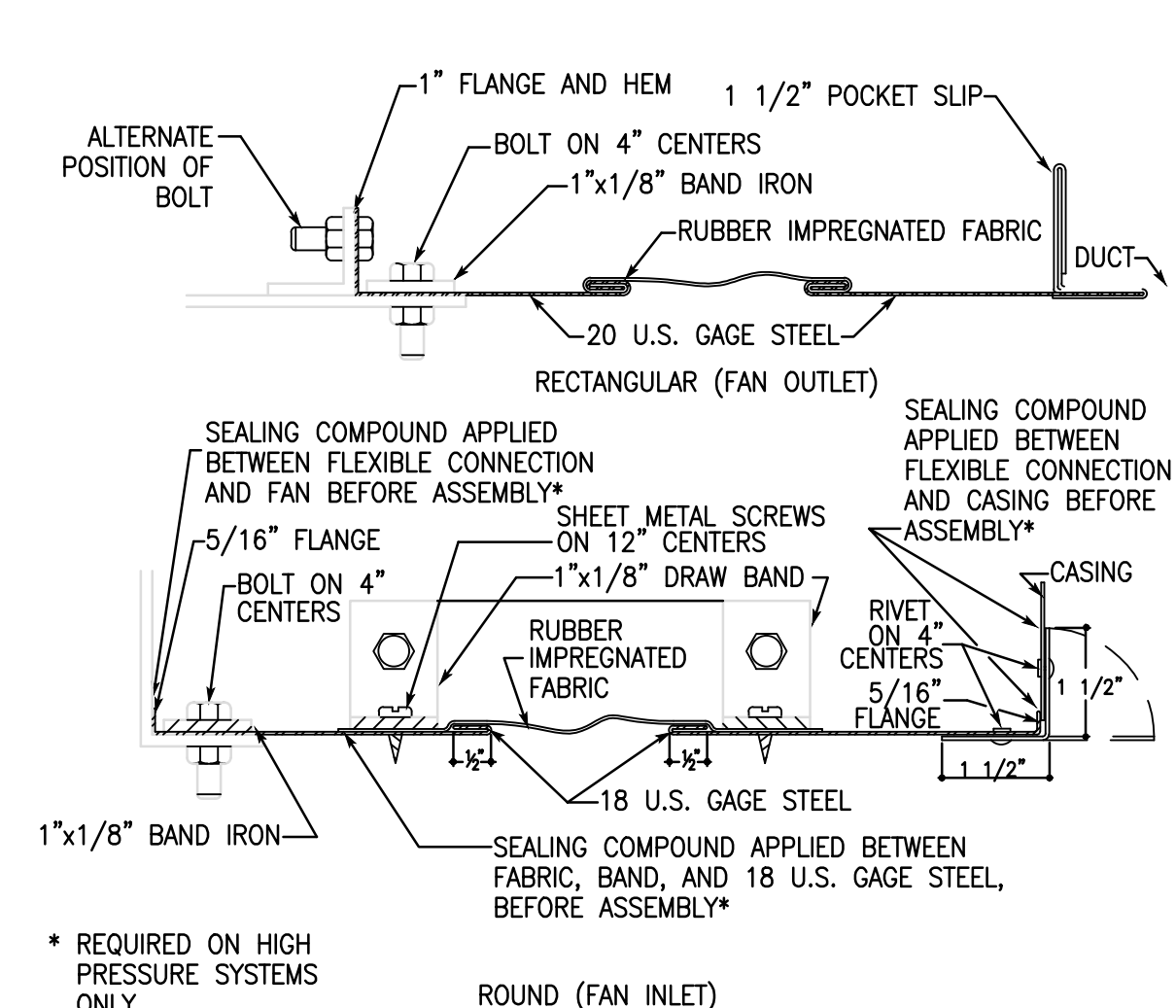
MARK	VAV UNIT	TOTAL C.F.M.	O.A. C.F.M.	EXT. S.P. IN W.G.	EST. FAN EFF.	MIN MOTOR H.P.	VOLTAGE PHASE HERTZ	TOTAL CAPACITY MBU/HR	SENS. CAPACITY MBU/HR	E.D.B. DEG F	E.W.B. DEG F	L.D.B. DEG F	L.W.B. DEG F	O.A. DRY BULB	O.A. WET BULB	PRESS. ATMOS. PSIG	PSYCOMETRICS		HEATING REQUIREMENT						
																	ENT. ENTHALPY	LEAV. ENTHALPY	MINIMUM ROWS	MAXIMUM FIN SPACING NO. IN.	MIN FACE AREA FT²	MBU/HR	FUEL	EAT	LAT
RTU-1	NO	9600	1000	0.9	32.0%	4.14	460/360	304.94	228.96	77.1	64.3	55.0	54.0	95.0	80.0	14.2	20.998	22.909	4	12	21.3	311.04	NAT GAS	65	95
RTU-2	NO	9600	1000	0.9	32.0%	4.14	460/360	304.94	228.96	77.1	64.3	55.0	54.0	95.0	80.0	14.2	20.998	22.909	4	12	21.3	311.04	NAT GAS	65	95
RTU-3	NO	9600	1000	0.9	32.0%	4.14	460/360	304.94	228.96	77.1	64.3	55.0	54.0	95.0	80.0	14.2	20.998	22.909	4	12	21.3	311.04	NAT GAS	65	95
RTU-4	NO	9600	1000	0.9	32.0%	4.14	460/360	304.94	228.96	77.1	64.3	55.0	54.0	95.0	80.0	14.2	20.998	22.909	4	12	21.3	311.04	NAT GAS	65	95
RTU-5	NO	9600	1000	0.9	32.0%	4.14	460/360	304.94	228.96	77.1	64.3	55.0	54.0	95.0	80.0	14.2	20.998	22.909	4	12	21.3	311.04	NAT GAS	65	95
RTU-6	NO	9600	1000	0.9	32.0%	4.14	460/360	304.94	228.96	77.1	64.3	55.0	54.0	95.0	80.0	14.2	20.998	22.909	4	12	21.3	311.04	NAT GAS	65	95
RTU-7	NO	7880	1200	0.9	32.0%	3.12	460/360	273.49	196.13	78.0	65.2	55.0	54.0	95.0	80.0	14.2	30.545	22.909	4	12	17.5	255.31	NAT GAS	65	95
TOTALS		65480	7200	0.9	0.3	28.97		2103.13	1569.89	77.2	64.4	55.0	54.0	95.0	80.0	14.2	209.93	160.37	4.0	12.0	20.8	2121.55	0.00	65.0	95.0

\* UNIT CONDENSER COILS SHALL BE FACTORY COATED, PROVIDE HAIL GUARDS AND HOT GAS REHEAT CYCLE

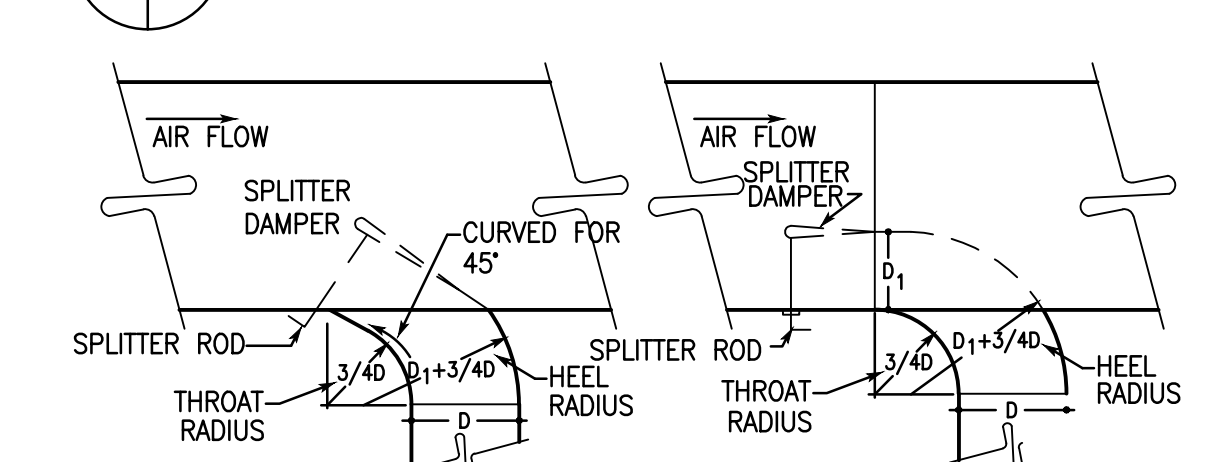
DEVIATIONS EXISTING LESS	TOTAL CFM	OA CFM	TONAGE
	65480	7200	175.3

MARK	FAN DATA			FAN REQUIREMENTS		UNIT DATA				
	TOTAL C.F.M.	EXT. S.P. IN W.G.	EST. FAN EFF.	MIN MOTOR H.P.	VOLTAGE PHASE HERTZ	DRIVE TYPE	TYPE	MAX. ALLOWABLE SOUND LEVEL	POWER DAMPER REQUIRED	MANUFACTURER
EF-1	140	0.5	25.0%	0.04	120/160	DIRECT	DOME DOWN	10	YES	COOK/KACME
EF-2	140	0.5	25.0%	0.04	120/160	DIRECT	DOME DOWN	10	YES	COOK/KACME
EF-3	150	0.5	25.0%	0.05	120/160	DIRECT	DOME DOWN	10	YES	COOK/KACME
EF-4	150	0.5	25.0%	0.05	120/160	DIRECT	DOME DOWN	10	YES	COOK/KACME
EF-5	180	0.5	25.0%	0.08	120/160	DIRECT	DOME DOWN	10	YES	COOK/KACME
EF-6	180	0.5	25.0%	0.08	120/160	DIRECT	DOME DOWN	10	YES	COOK/KACME
EF-7	150	0.5	25.0%	0.05	120/160	DIRECT	DOME DOWN	10	YES	COOK/KACME
TOTALS	1090	0.5	25.0%	0.34				10.0		

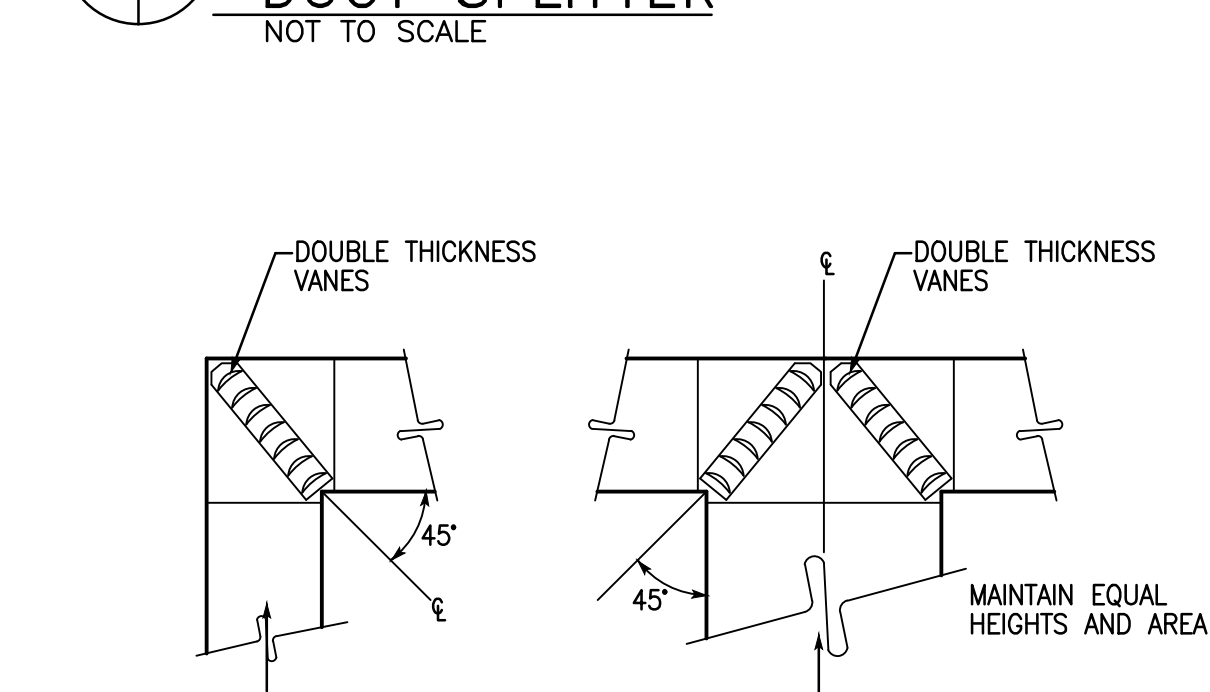
- GENERAL NOTES - MECHANICAL:
- THE CONTRACTOR IS FULLY RESPONSIBLE FOR PERFORMING THE WORK IN COMPLIANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL CODES UNDER THIS SECTION OF THE CONTRACT. IF THE CONTRACTOR DETERMINES THAT THE CONTRACT DOCUMENTS AND PLANS ARE NOT IN COMPLIANCE WITH THE APPLICABLE LOCAL CODES, HE SHALL INFORM THE ARCHITECT PRIOR TO CONSTRUCTION START FOR DIRECTION. FAILURE TO DO SO SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO MEET APPLICABLE LOCAL CODES, AND REWORK SHALL BE AT CONTRACTOR'S EXPENSE.
  - CONTRACTOR SHALL INSTALL NEW DUCTWORK FLUSH WITH THE BUILDING STRUCTURE TO ACCOMMODATE NEW CEILING WHERE THEY OCCUR. CONTRACTOR SHALL COORDINATE ALL INSTALLATION WORK WITH ARCHITECTURAL AND ELECTRICAL DESIGN DOCUMENTS. DUCTWORK SHALL BE MODIFIED AS NECESSARY AND REQUIRED TO FIT AROUND BUILDING STRUCTURES, ARCHITECTURAL BUILD-OUT AND ELECTRICAL BUS-WAY INSTALLATIONS. MECHANICAL CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE WORK SCOPE OF OTHER TRADES AND PARTICIPATE IN COORDINATING ALL CONSTRUCTION EFFORTS.
  - CONTRACTOR SHALL PROVIDE ALL EXHAUST SYSTEMS, INCLUDING CONTROLS, FANS AND EXHAUST DUCTS.
  - CONTRACTOR SHALL PROVIDE ALL CEILING DIFFUSERS AS SHOWN. CONNECT EACH DIFFUSER TO THE MAIN DISTRIBUTION DUCTS WITH A FLEX-DUCT SECTION; CONNECTIONS SHALL BE COMPLETED IN ACCORDANCE WITH THE DETAIL. EACH FLEX-DUCT CONNECTION SHALL INCLUDE A BUTTERFLY DAMPER TO BE INSTALLED AT THE TRUNK DUCT.
  - CONTRACTOR SHALL PROVIDE ALL DUCTWORK REQUIRED TO COMPLETE THE HVAC SYSTEM. TIE IN BRANCH DUCTS TO EXISTING MAIN DUCTS WITH SHEET METAL FLANGES. FLANGE CONNECTION SHALL BE FASTENED WITH CRIMPED SHEET METAL STRIPS AND SEALED WITH SILICONE CAULK. MEDIUM PRESSURE AND EXPOSED DUCT WORK SHALL BE SPIRAL WRAPPED DOUBLE WALL WITH PERFORATED LINER.
  - CONTRACTOR SHALL PROVIDE SMOKE-FIRE DAMPERS IN ALL DIFFUSERS AND GRILLES LOCATED IN FIRE RATED CEILING. ALL HALLWAY DIFFUSERS AND GRILLES SHALL BE INSTALLED WITH FIRE DAMPERS. ALL DIFFUSERS AND GRILLES SHOWN WITH A CIRCLED "F" SHALL BE EQUIPPED WITH FIRE DAMPERS. PROVIDE SMOKE-FIRE DAMPERS AT ALL FIRE WALL PENETRATIONS.
  - ALL OPENINGS CUT IN MASONRY AND PLASTER WALLS OR CONCRETE FLOORS SHALL BE CORE DRILLED OR SAWEED WHEN POSSIBLE. CONTRACTOR SHALL CHECK BUILDING CONSTRUCTION BEFORE MAKING PENETRATIONS TO AVOID CUTTING THROUGH STRUCTURAL BEAMS AND REINFORCING. CONTRACTOR SHALL INFORM THE ENGINEER IF REINFORCING IS CUT OR DAMAGED WHILE MAKING OPENINGS. CONTRACTOR SHALL REINFORCE ALL OPENINGS AS REQUIRED BY DRAWINGS AND SPECIFICATIONS. PATCH AND SEAL OPENINGS WITH 8000 PSI CEMENT GROUT. INSTALL DECORATIVE TRIM (EQUIPMENT FLANGES, FRAMING OR ESCUTCHEONS) AROUND OPENINGS IN FINISHED AREAS. COORDINATE ALL CUTTING AND PATCHING WITH THE OTHER TRADES.
  - ON ANY WORK SHOWN ON MECHANICAL DRAWINGS REQUIRING DEMOLITION OF NEW BUILDING STRUCTURES AND FINISHES, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLETE THE NECESSARY DEMOLITION. CONTRACTOR SHALL PATCH AND REPAIR ALL DEMOLITION WORK. PATCHING SHALL BE COMPLETED WITH THE SAME MATERIALS AS THE SURROUNDING AREAS, OR WITH ARCHITECT-APPROVED PATCHING MATERIALS. REPAIRS SHALL BE COMPLETED ACCORDING TO ARCHITECTURAL SPECIFICATIONS. ALL REFINISHING SHALL BE APPROVED BY THE ARCHITECT.
  - CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETING THE INSTALLATION OF THE AIR DISTRIBUTION SYSTEM SHOWN. DUCTWORK, DUCT ACCESSORIES AND CONTROLS SHOWN AND REQUIRED SHALL BE SUPPLIED AND INSTALLED. ALL INSTALLATION WORK SHALL BE DONE IN ACCORDANCE WITH APPLICABLE CODES, INCLUDING NFPA 90A AND 90B.
  - CONTRACTOR SHALL BALANCE ALL AIR DISTRIBUTION SYSTEMS TO ACHIEVE THE AIR VOLUME REQUIREMENTS INDICATED. BALANCING SHALL INCLUDE ADJUSTMENT OF ALL MANUAL VOLUME DAMPERS, SPLITTER DAMPERS, ZONE DAMPERS (IF REQUIRED), BUTTERFLY DAMPERS AND INDIVIDUAL DIFFUSER VOLUME DAMPERS (FINAL BALANCINGS ONLY). CONTRACTOR SHALL SUPPLY THE ENGINEER WITH A COMPLETE BALANCING REPORT WHICH INCLUDES, VOLUME, ROOM REFERENCE AND VAV BOX ZONE VOLUME TOTALS.
  - MOUNT ALL THERMO-SENSORS 48" ABOVE THE FINISHED FLOOR LEVEL. SENSORS SHOWN SHALL BE IN CONTROL OF THE ZONE SYSTEM WHICH IS SUPPLYING AIR TO THE AREA WHERE THE THERMOSTAT IS LOCATED. CONTRACTOR SHALL COORDINATE THE FINAL LOCATION OF EACH SENSOR WITH THE ROOM FINISHES AND USES. CONTRACTOR SHALL SUPPLY AND INSTALL ALL CONTROL VOLTAGE WIRING AND CONDUIT.
  - CONTRACTOR SHALL COORDINATE THE FINAL LOCATIONS OF ALL CEILING DIFFUSERS WITH LIGHTING INSTALLATIONS AND ARCHITECTURAL REFLECTED CEILING PLANS. MOVE THE DIFFUSER LOCATIONS IF REQUIRED TO AVOID OBSTRUCTIONS FROM DUCTWORK AND LIGHT FIXTURES.
  - CONTRACTOR SHALL FIELD VERIFY ALL DUCTWORK DIMENSIONS BEFORE CUTTING AND FABRICATING SYSTEMS. ALL DIMENSIONS SHOWN ARE APPROXIMATE. CROSS-SECTION DIMENSIONS ARE CLEAR FREE AREA.
  - ALL CHILLED (COLD) PARTS AND EQUIPMENT SHALL BE INSULATED AND SEALED WITH A VAPOR BARRIER. PIPE SUPPORT SHALL BE INSTALLED TO ALLOW FOR INSULATION. ALL DUCTWORK SHALL BE SUPPORTED FROM THE STRUCTURE.
  - VERIFY THE LOCATION OF ALL WALLS, PARTITIONS, DOORS, CABINETS, AND CEILINGS FROM ACTUAL FIELD MEASUREMENTS.
  - PROVIDE SMOKE DETECTOR AND SHUTDOWN CONTROLS ON ALL RTUS AND SUPPLY FANS. SMOKE DETECTORS SHALL BE PROVIDED BY ELECTRICAL/FIRE AND INSTALLED BY MECHANICAL. COORDINATE TO PROVIDE A COMPLETE SYSTEM. PROVIDE BOTH SUPPLY AND RETURN SIDE DEVICES.
  - ELECTRICAL SHALL PROVIDE 120V, 1PH, 60HZ POWER TO ALL HVAC DEVICES TO SUPPORT DDC PANELS, SMOKE DAMPERS, SUPPLY FAN DAMPERS AND VALVE ACTUATORS, INCLUDING CONDUIT CONDUCTOR, DISCONNECT DEVICE, FLEXIBLE CONNECTORS AND ALL TERMINATIONS. PROVIDE POWER TO LOW VOLTAGE TRANSFORMERS. COORDINATE WITH ELECTRICAL TO VERIFY THAT ALL CONTROL POWER IS PROVIDED.



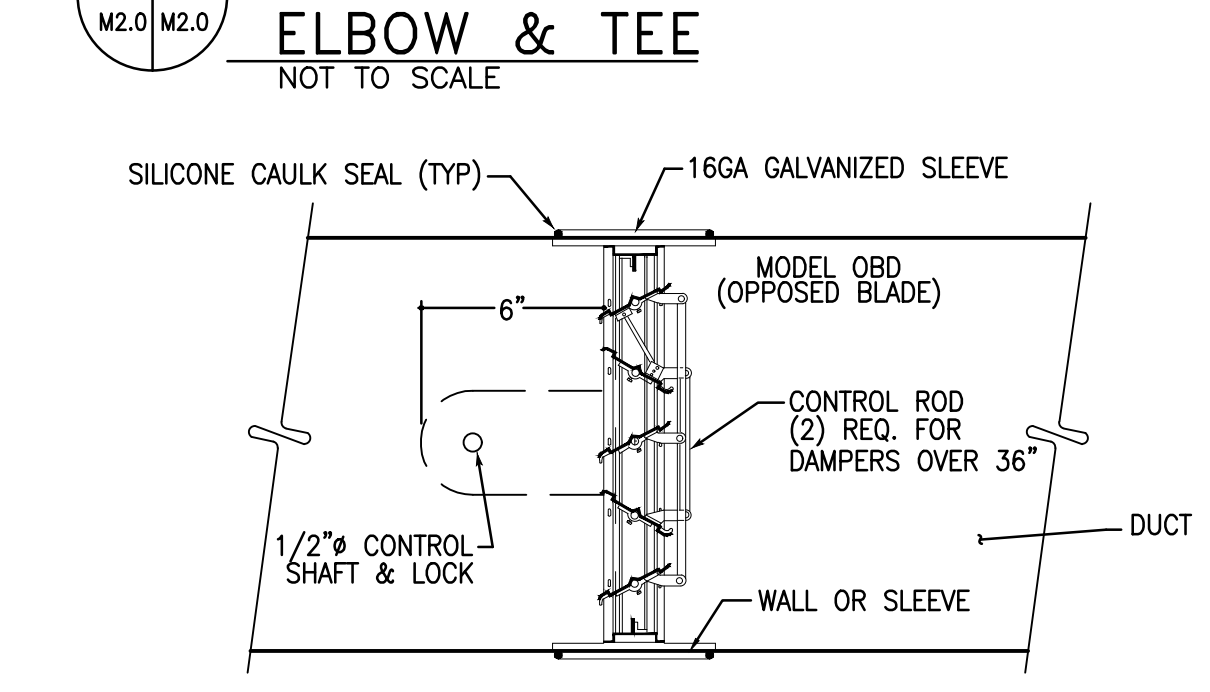
1 FLEXIBLE DUCT CONNECTION NOT TO SCALE



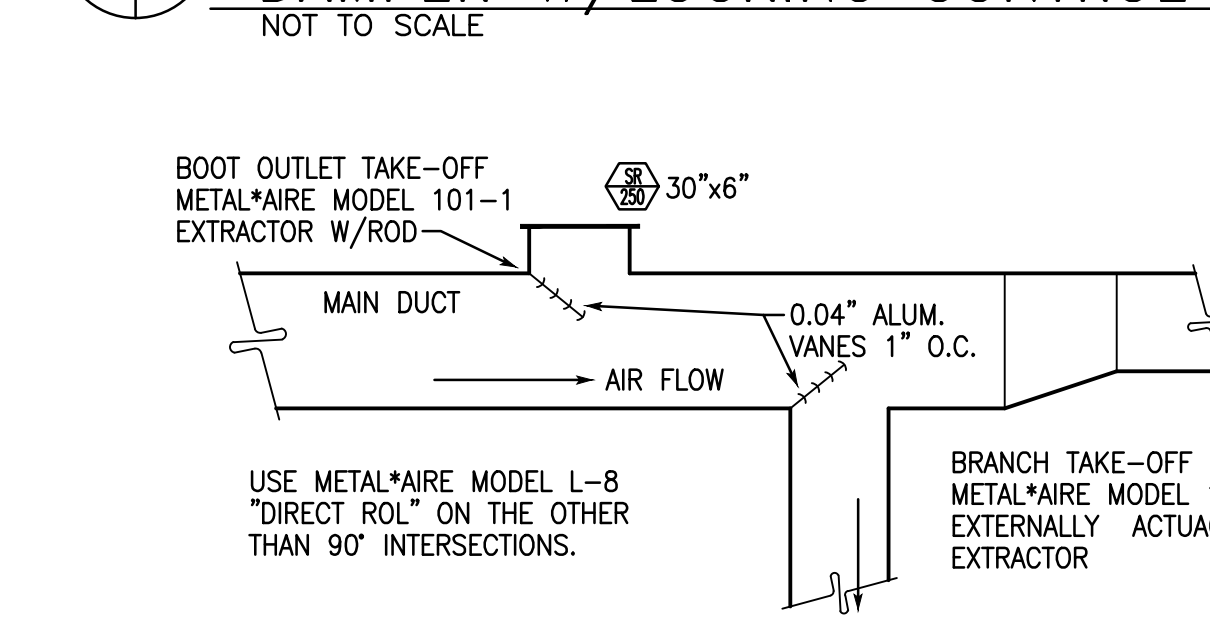
2 REGISTER OR BRANCH DUCT SPLITTER NOT TO SCALE



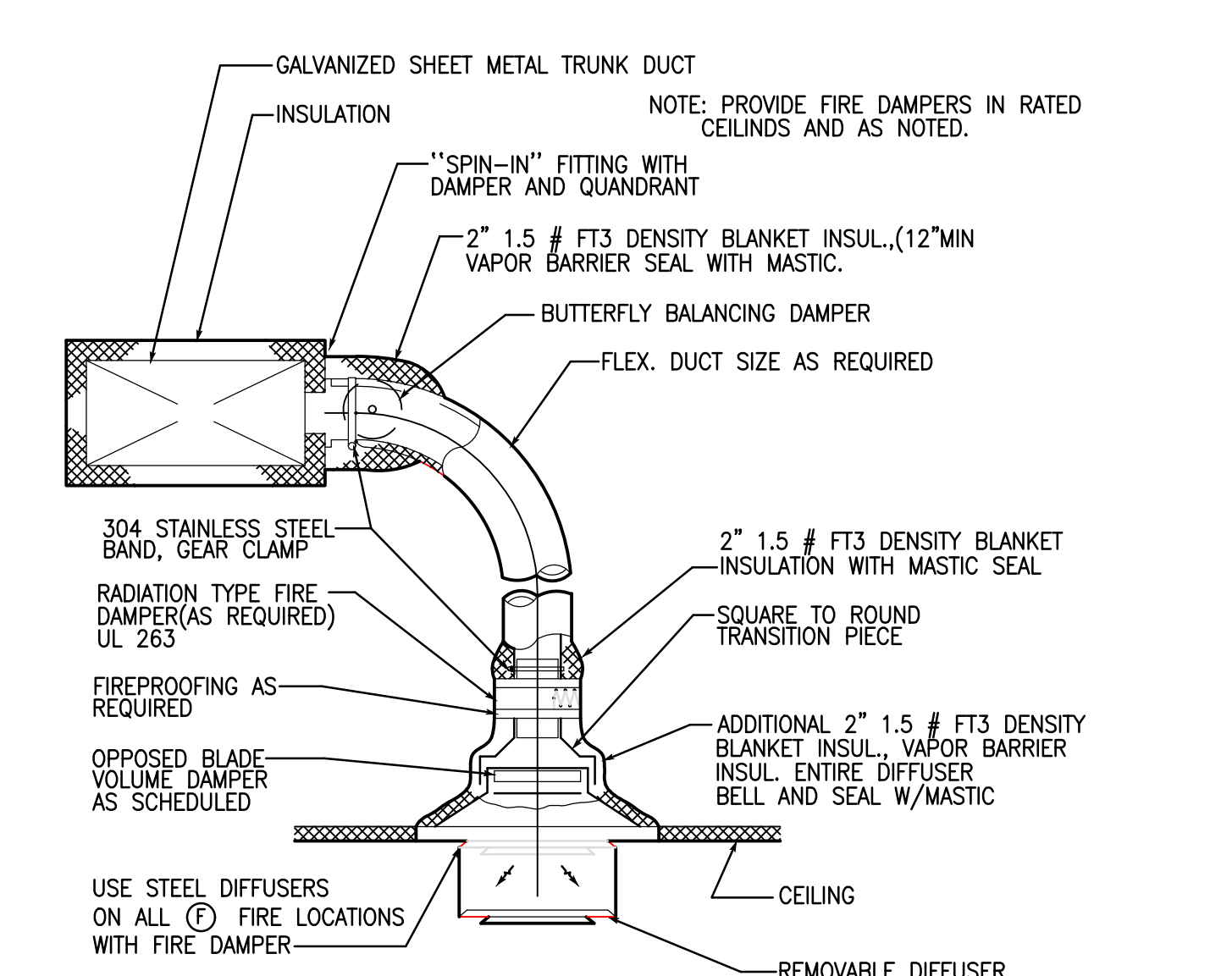
3 RECTANGULAR DUCT ELBOW & TEE NOT TO SCALE



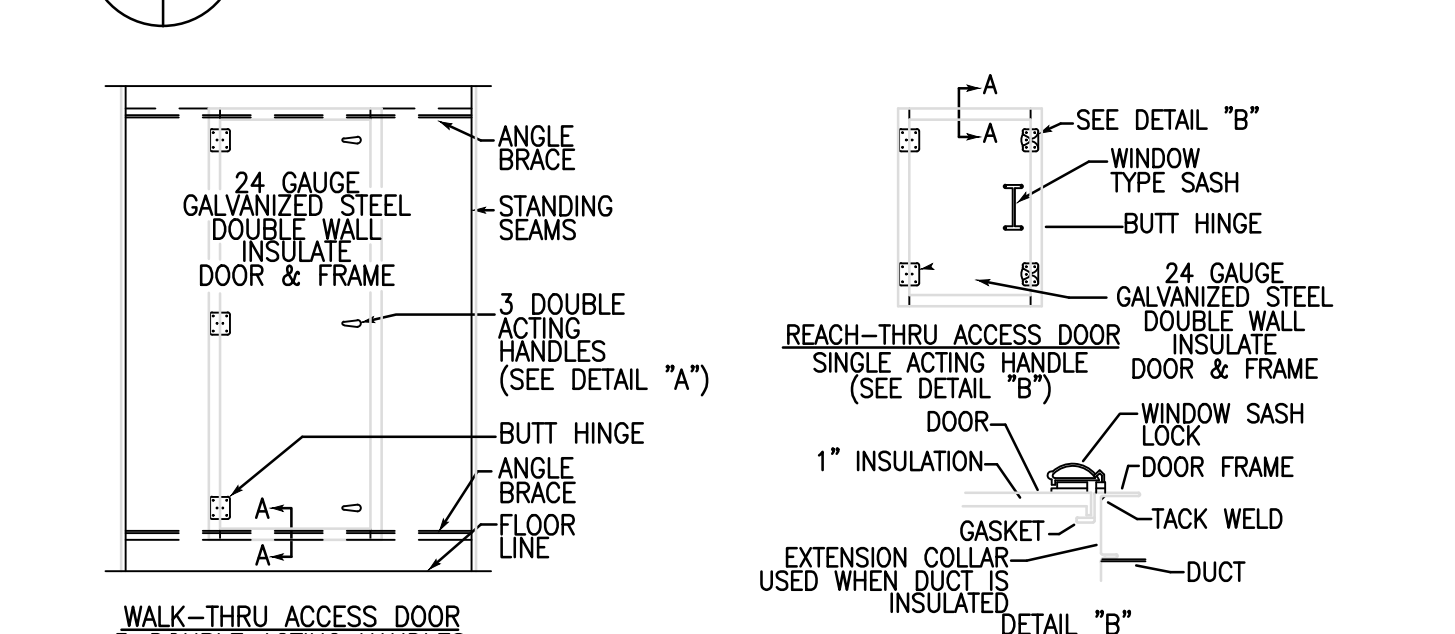
4 MANUAL OPPOSED BLADE VOLUME DAMPER W/LOCKING CONTROL SHAFT NOT TO SCALE



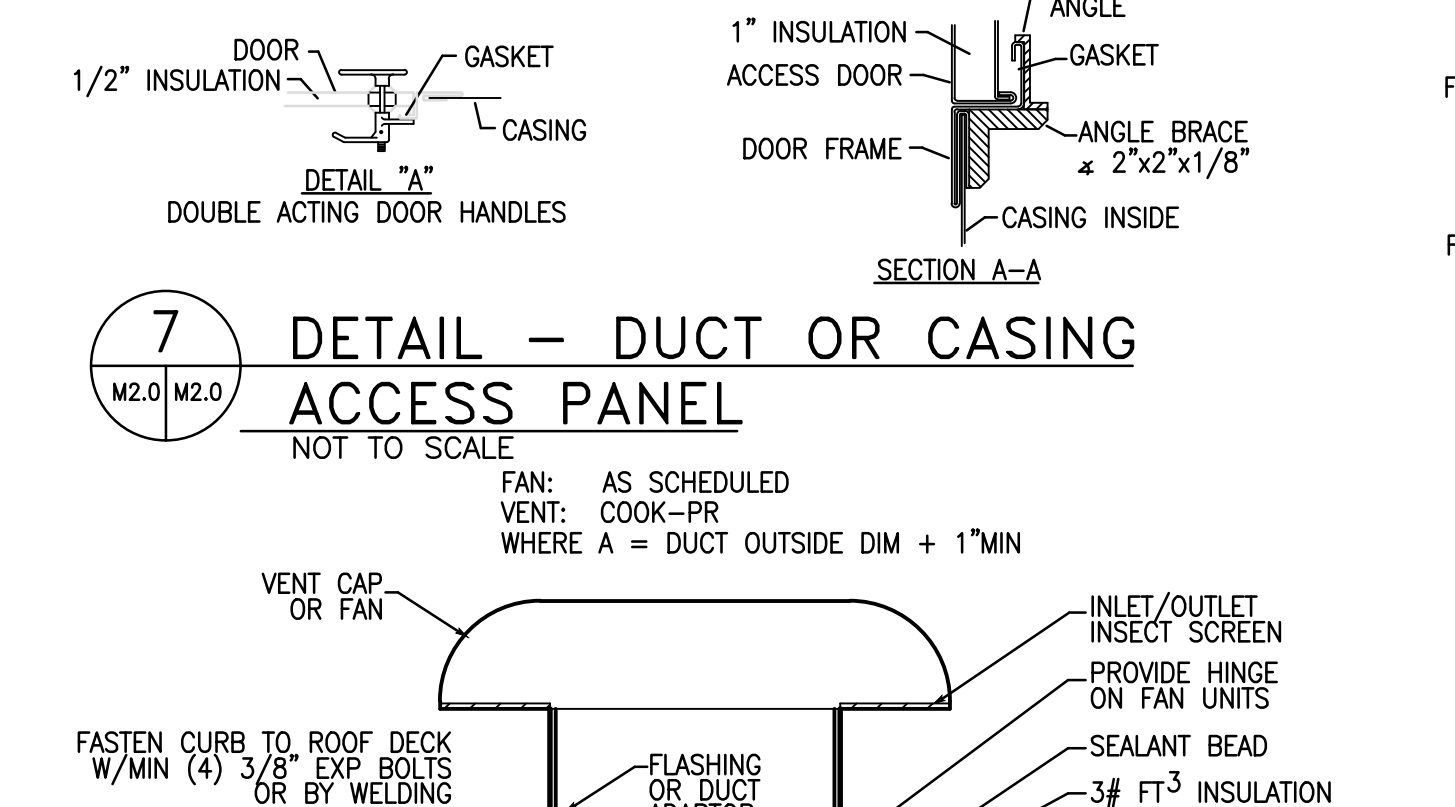
5 REGISTER OR BRANCH DUCT EXTRACTOR NOT TO SCALE



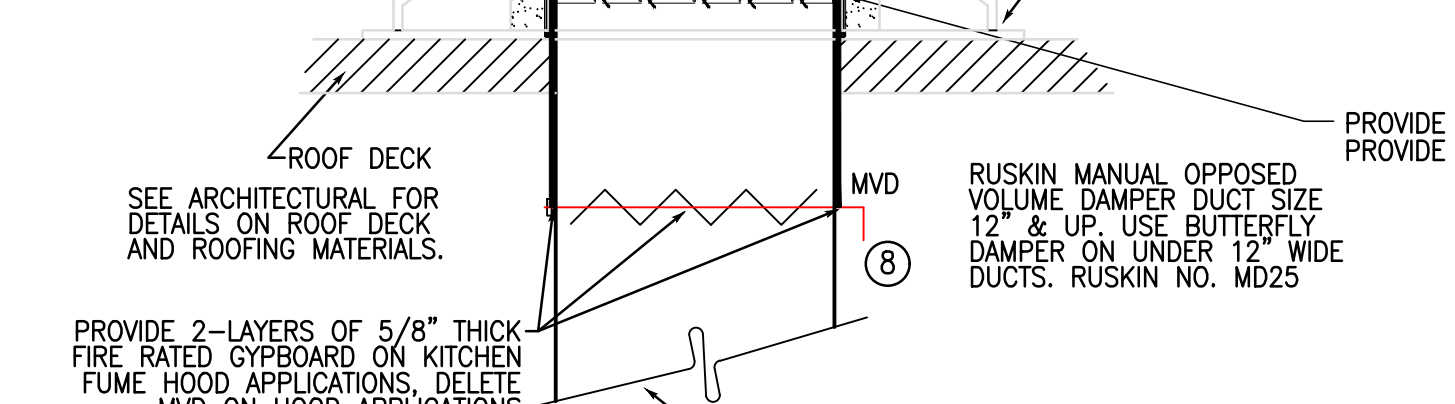
6 DETAIL - CEILING DIFFUSER (STANDARD) NOT TO SCALE



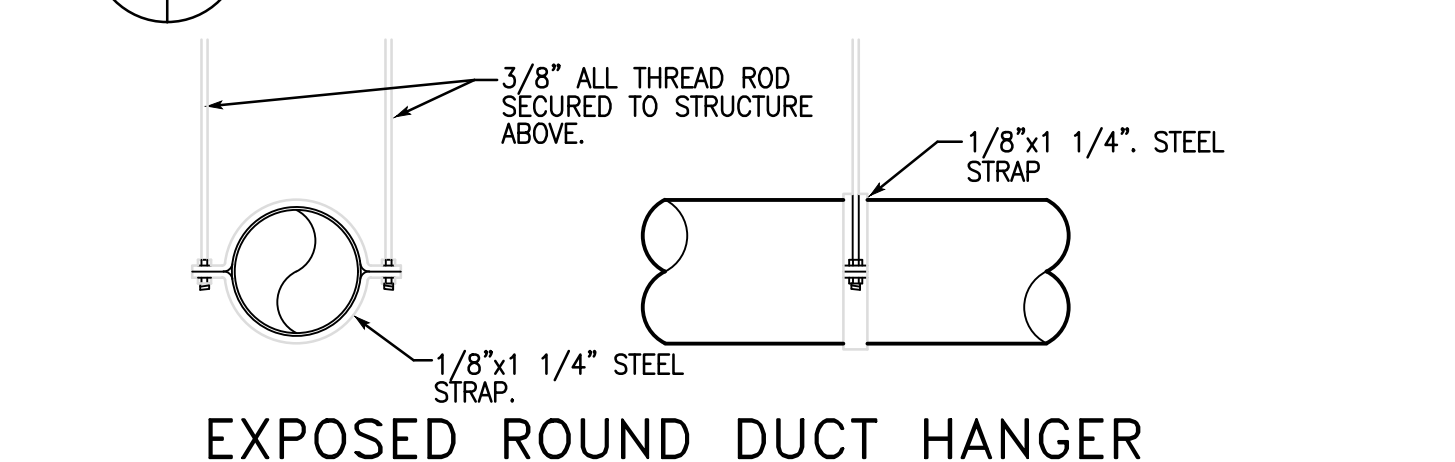
7 DETAIL - DUCT OR CASING ACCESS PANEL NOT TO SCALE



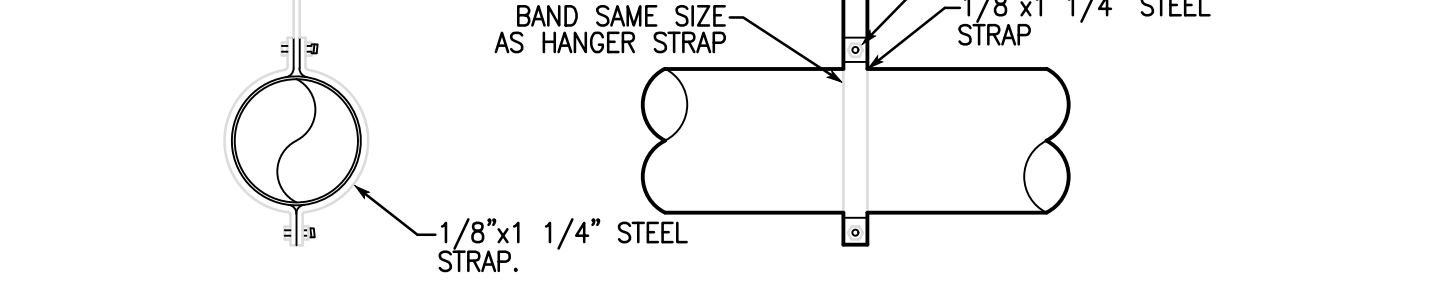
8 DETAIL - VENT W/ROOF CAP (OR FAN) NOT TO SCALE



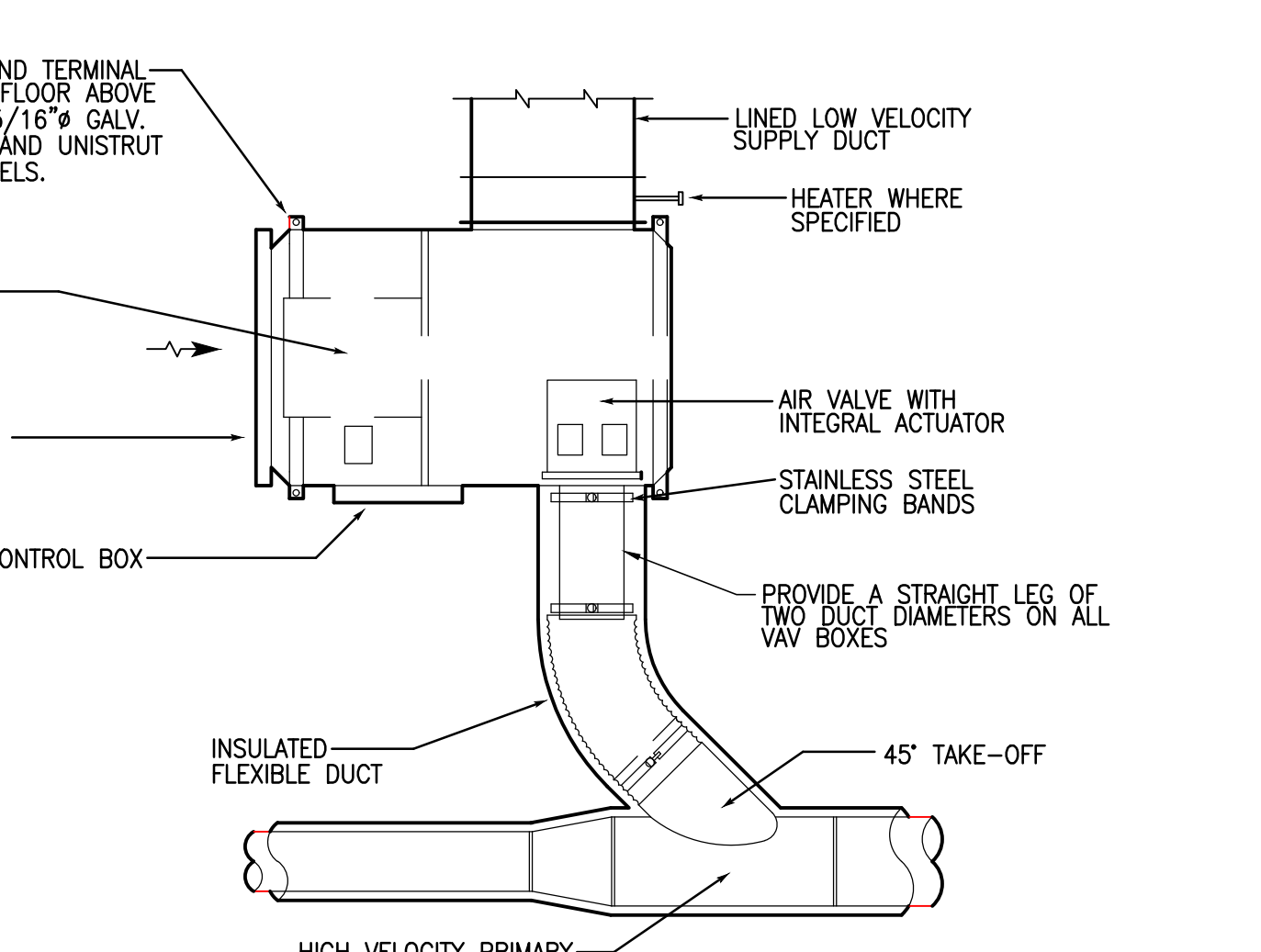
9 CONCEALED ROUND DUCT HANGER NOT TO SCALE



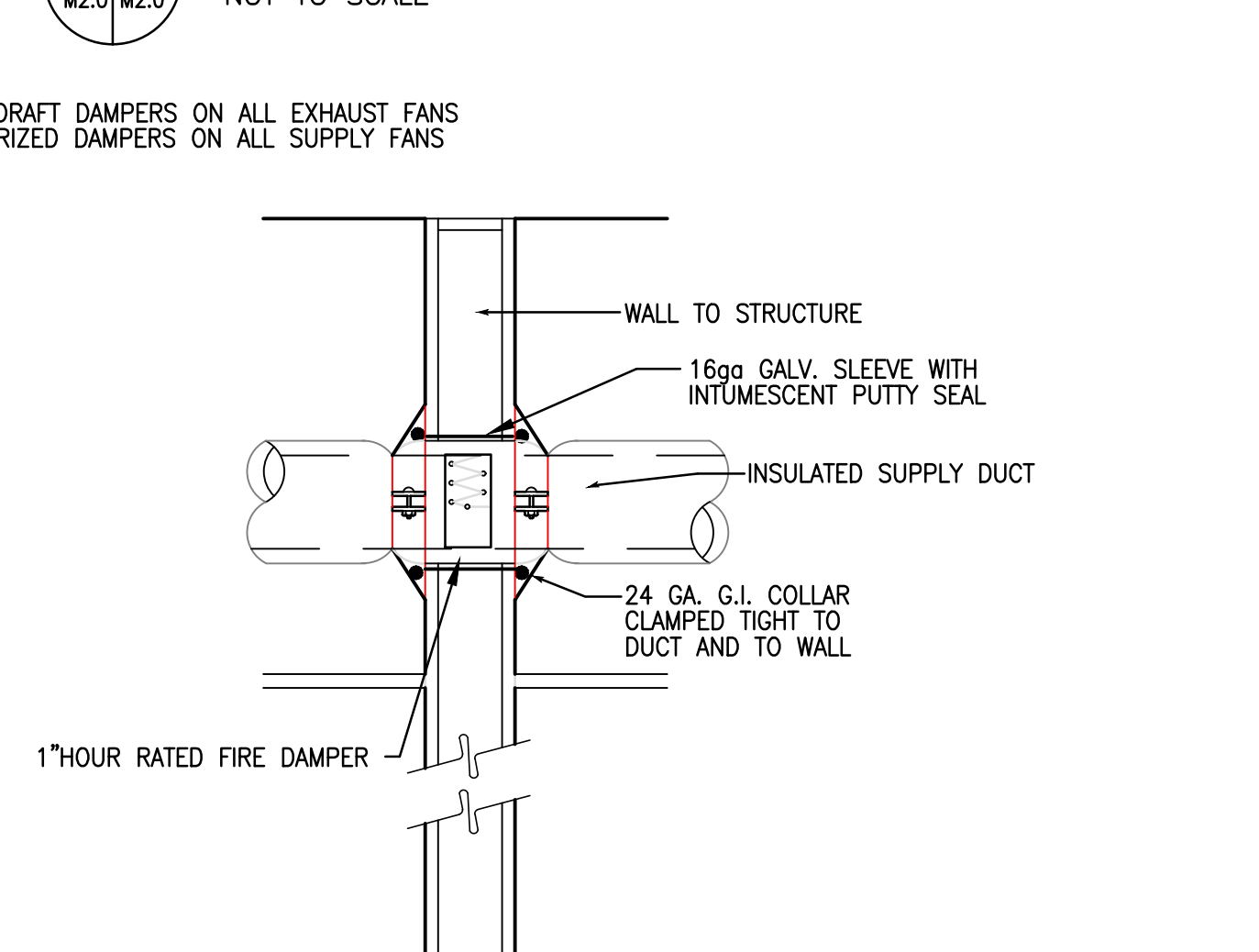
10 DETAIL - VAV TERMINAL NOT TO SCALE



11 DETAIL - ROUND DUCT WALL PENETRATION NOT TO SCALE



10 DETAIL - VAV TERMINAL NOT TO SCALE



11 DETAIL - ROUND DUCT WALL PENETRATION NOT TO SCALE

MARK	VAV UNIT	FAN SECTION			COOLING COIL										HEATING REQUIREMENT										
		TOTAL C.F.M.	O.A. C.F.M.	EXT. S.P. IN W.G.	EST. FAN EFF.	MIN MOTOR H.P.	VOLTAGE PHASE HERTZ	TOTAL CAPACITY MBU/HR	SENS. CAPACITY MBU/HR	E.D.B. DEG F	E.W.B. DEG F	L.D.B. DEG F	L.W.B. DEG F	O.A. DRY BULB	O.A. WET BULB	PRESS. ATMOS. PSIG	ENT. ENTHALPY	LEAV. ENTHALPY	MINIMUM ROWS	MAXIMUM FIN SPACING NO. IN.	MIN FACE AREA FT²	MBU/HR	KW HEAT	EAT	LAT
RTU-6	YES	11670	1750	3.0	32.0%	17.15	460/360	403.36	289.87	78.0	65.1	55.0	54.0	95.0	80.0	14.2	30.513	22.909	4	12	25.9				
TOTALS		11670	1750	3.0	0.3	17.21		403.36	289.87	78.0	65.1	55.0	54.0	95.0	80.0	14.2	30.513	22.91	4.0	12.0	25.9				

\* UNIT CONDENSER COILS SHALL BE FACTORY COATED, PROVIDE HAIL GUARDS AND HOT GAS REHEAT CYCLE

DEVIATIONS EXISTING LESS	TOTAL CFM	OA CFM	TONAGE
	11670	1750	33.6

Key Plan: A, B

Project No.:

Drawing Date: , Drawn: C.R.C., Checked: R.B.W., Scale: AS NOTED

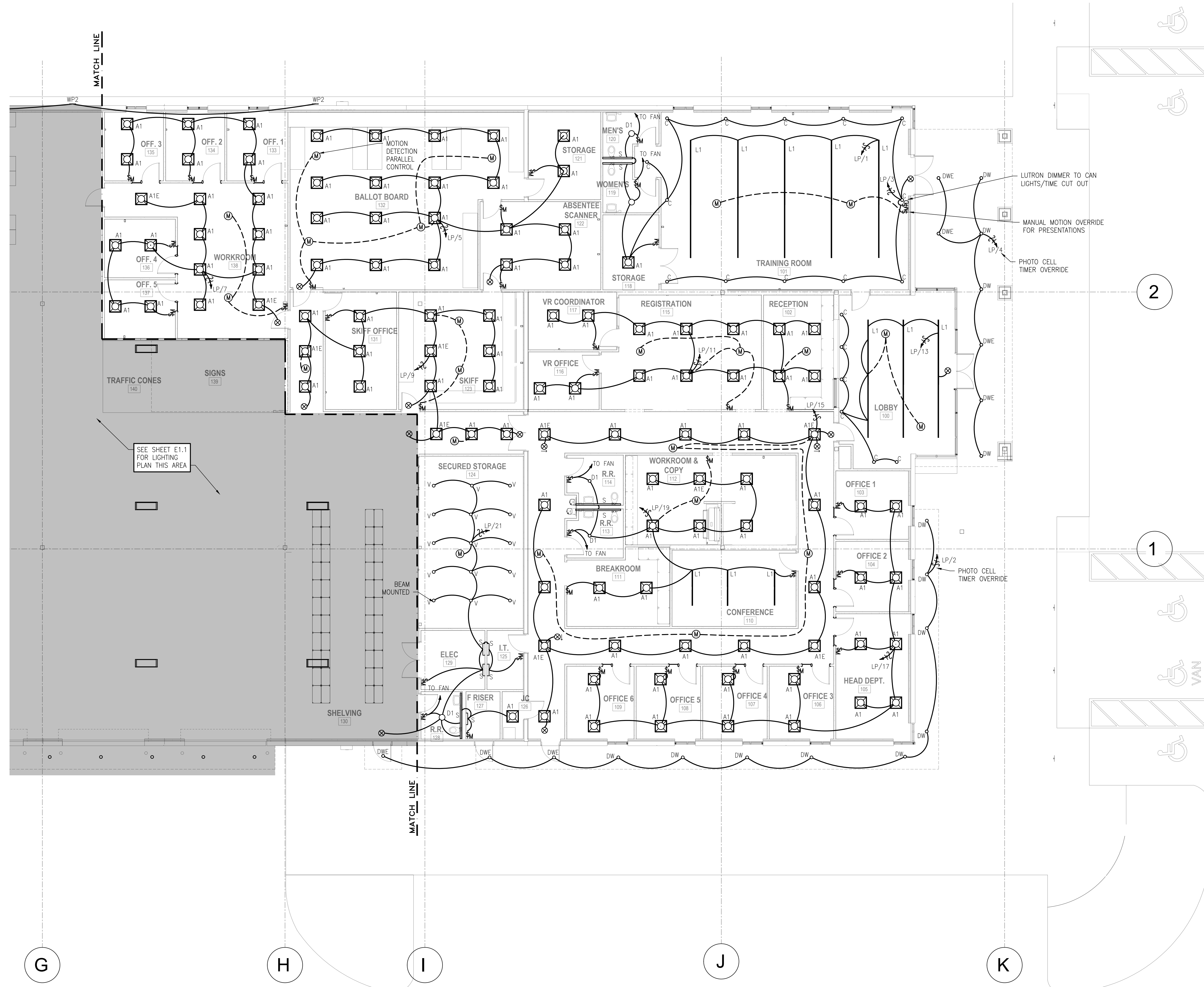
Issue Log	No.	Descriptor	Date

Revisions	No.	Description	Date

**ELECTRICAL SYMBOL LEGEND**  
(ALL SYMBOLS MAY NOT APPLY TO THIS PROJECT)  
SYMBOL DESCRIPTION

- CEILING MOUNTED LIGHT FIXTURE
- ◌ WALL MOUNTED LIGHT FIXTURE
- CEILING MOUNTED FLUORESCENT LIGHT FIXTURE
- WALL MOUNTED FLUORESCENT LIGHT FIXTURE
- CEILING MOUNTED HID FIXTURE
- WALL MOUNTED HID FIXTURE
- ⊗ EXIT SIGN
- ⊗ EXIT SIGN W/EMERGENCY LIGHTING
- ⊗ EMERGENCY LIGHTING
- ⊗ WALL SWITCH-SEE WIRING DEVICE SCHEDULE
- ⊗ RECEPTACLE-SEE WIRING DEVICE SCHEDULE
- ⊗ DOUBLE DUPLEX RECEPTACLE, 120V
- ⊗ ISOLATED GROUND RECEPTACLE
- ⊗ FLOOR OUTLET BOX
- ⊗ MANUAL MOTOR STARTER, SURFACE MOUNTED
- ⊗ MAGNETIC MOTOR STARTER
- ⊗ CONTACTOR-C, RELAY-R
- ⊗ DISCONNECT SWITCH
- ⊗ COMBINATION STARTER
- ⊗ TRANSFORMER
- ⊗ LIGHTING PANEL
- ⊗ DISTRIBUTION PANEL OR SWITCHBOARD AS NOTED
- ⊗ TELEPHONE PANEL
- ⊗ WEATHERPROOF DEVICE OR ENCLOSURE
- RG5 RIGID GALVANIZED STEEL CONDUIT
- PVC POLY VINYL CHLORIDE CONDUIT
- EMT ELECTRICAL METALLIC TUBING CONDUIT
- ⊗ PHOTOELECTRIC SWITCH
- ⊗ UNDER FLOOR DUCT
- ⊗ EXPANSION FITTING
- ⊗ JUNCTION BOX
- ⊗ 120V 1PH. CONNECTION
- ⊗ 208V 1PH. CONNECTION
- ⊗ 208V 3PH. CONNECTION
- ⊗ 277V 1PH. CONNECTION
- ⊗ 240V 1PH. CONNECTION
- ⊗ 240V 3PH. CONNECTION
- ⊗ 480V 3PH. CONNECTION
- ⊗ CONTROL OUTLET OR CONNECTION
- ⊗ BUZZER
- ⊗ THERMOSTAT
- ⊗ WALL MOUNTED TELEVISION OUTLET
- ⊗ CLOCK-SINGLE FACE
- ⊗ CLOCK-DOUBLE FACE
- ⊗ PROGRAM SYSTEM MASTER CLOCK
- ⊗ ELECTRONIC CLOCK SYSTEM TRANSMITTER
- ⊗ PROGRAM SYSTEM BELL
- ⊗ FIRE ALARM SYSTEM MANUAL PULL STATION
- ⊗ FIRE ALARM SYSTEM CONTROL PANEL
- ⊗ REMOTE ANNUNCIATOR
- ⊗ SMOKE DETECTOR
- ⊗ DUCT SMOKE DETECTOR
- ⊗ PROJECTED BEAM TYPE SMOKE DETECTOR
- ⊗ HEAT DETECTOR
- ⊗ FLAME DETECTOR
- ⊗ VISUAL FIRE ALARM (ADA)
- ⊗ FIRE ALARM HORN
- ⊗ AUDIO/VISUAL ALARM
- ⊗ DOOR HOLDER

- F FIRE ALARM SYSTEM BELL
  - R FIRE ALARM RELAY
- SYMBOL DESCRIPTION
- LA/1,2 PANEL AND CIRCUIT NUMBERS
- ARROWS INDICATE HOME RUN TO PANEL  
CONDUIT SIZE INDICATED (CONTRACTOR TO VERIFY N.E.C. CONDUIT MAXIMUM FILL AND CONDUCTOR IMPACT WITH TYP OF WIRE)  
BRANCH CIRCUIT BREAKER IF OTHER THAN 1P/20A
- GROUNDING CONDUCTOR
  - NEUTRAL CONDUCTOR
  - SWITCHED CONDUCTOR
  - UNGROUNDING CONDUCTORS
  - CONDUCTOR SIZE PER N.E.C. (SEE #10 FOR MINIMUM FOR 20 AMP CIRCUITS WITH RUN OF 100 FT. OR MORE)
  - CONDUCTORS SHALL BE SIZED INDICATED FOR ENTIRE LENGTH OF CIRCUIT
  - D DATA SYSTEM RACEWAY
  - EM EMERGENCY POWER SYSTEM RACEWAY
  - FA FIRE ALARM SYSTEM RACEWAY AND/OR CONDUCTORS
  - S SOUND SYSTEM RACEWAY AND/OR CONDUCTORS
  - T TELEPHONE SYSTEM RACEWAY AND/OR CONDUCTORS
  - TV TELEVISION SYSTEM RACEWAY AND/OR CONDUCTORS
  - P PROGRAM SYSTEM RACEWAY AND/OR CONDUCTORS
  - C CONTROL SYSTEM RACEWAY AND/OR CONDUCTORS
  - OR ON ROOF RACEWAY
  - WM SURFACE RACEWAY
  - AC ABOVE CEILING RACEWAY
  - UG UNDERGROUND RACEWAY
  - UB UNDERBUILDING RACEWAY
  - E EXISTING RACEWAY TO REMAIN
  - X EXISTING RACEWAY TO BE REMOVED OR ABANDONED
  - NEW RACEWAY
- ⊗ REMOTE INDICATOR
  - ⊗ POWER POLE
  - ⊗ CEILING MOUNTED SPEAKER
  - ⊗ WALL MOUNTED SPEAKER
  - ⊗ CALL-IN SWITCH
  - ⊗ CALL-IN SWITCH WITH PRIVACY FEATURE
  - ⊗ WALL MOUNTED TELEPHONE OUTLET
  - ⊗ WALL MOUNTED OUTLET FOR PAY TELEPHONE
  - ⊗ FLOOR TELEPHONE OUTLET
  - ⊗ TELEPHONE/DATA OUTLET
  - ⊗ COMPUTER OUTLET (CONDUIT AND BOX ONLY)
  - ⊗ SOUND CONSOLE
  - ⊗ WALL MOUNTED MICROPHONE OUTLET
  - ⊗ FLOOR MOUNTED MICROPHONE OUTLET
  - ⊗ AMPLIFIER LINE LIFT JACK
  - ⊗ REMOTE HANDSET
  - ⊗ INTERCOMMUNICATIONS SYSTEM REMOTE UNIT
  - ⊗ INTERCOMMUNICATIONS SYSTEM MASTER UNIT
  - ⊗ DOOR CONTROL (CONDUIT ONLY)
  - ⊗ DOOR ALARM (CONDUIT ONLY)
  - ⊗ SURVEILLANCE CAMERA
  - ⊗ TIMER/CONTACTOR

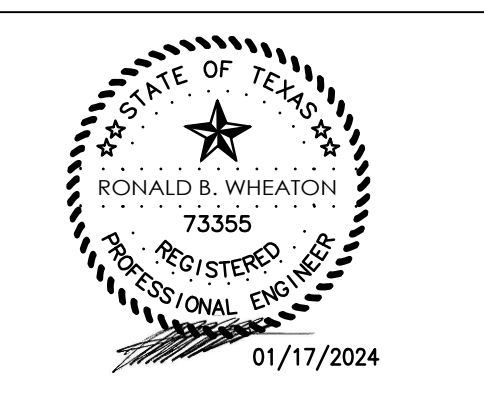


**1 ELECTRICAL LIGHTING PLAN -- ADMINISTRATION**  
SCALE: 1/8"=1'-0"

PANEL 'LP'											
100 AMP, M.C.B., 120Y/208V, 3PH, 4W, SURFACE, NEMA 1, 45 KAIC											
LIGHTING CONTROLS, TIMER/PHOTO CONTROL INPUTS											
CKT #	LOAD SERVED	LOAD	CONDUIT & WIRE SIZE	BKR SIZE	A	B	C	CONDUIT & WIRE SIZE	LOAD	LOAD SERVED	CKT #
1	TRAINING MAIN	1000	3/4"2-#12,1-#12G	20/1	A			3/4"2-#10,1-#12G	1200	FRONT/SOUTH AWN.	2
3	TRAINING CANS	650	3/4"2-#12,1-#12G	20/1	B			3/4"2-#10,1-#12G	900	FRONT PORCH	4
5	BALLOT BOARD	1000	3/4"2-#12,1-#12G	20/1	C			3/4"2-#10,1-#12G	700	LOADING AREA	6
7	WORK ROOM 138 AREA	950	3/4"2-#12,1-#12G	20/1	A			3/4"2-#8,1-#12G	1200	WALL PAKS	8
9	SKIFF AREA	750	3/4"2-#12,1-#12G	20/2	B			3/4"2-#8,1-#12G	600	SOUTH CANOPIES	12
11	REG-REC.	700	3/4"2-#12,1-#12G	20/1	C			3/4"2-#8,1-#12G	600	SOUTH CANOPIES	12
13	LOBBY	900	3/4"2-#12,1-#12G	20/1	A						14
15	CORRIDOR	750	3/4"2-#12,1-#12G	20/1	B			3/4"2-#8,1-#12G	1800	PARKING LIGHTS	16
17	SOUTH OFFICE	800	3/4"2-#12,1-#12G	20/1	C						18
19	BREAK-CONF. AREA	800	3/4"2-#12,1-#12G	20/1	A			3/4"2-#8,1-#12G	2400	PARKING LIGHTS	20
21	SECURED STORAGE	1050	3/4"2-#12,1-#12G	20/1	B						22
23	WAREHOUSE MAIN	2784	3/4"2-#8,1-#12G	20/2	C			3/4"2-#8,1-#12G	300	FLAG POLE LIGHTS	24
25					A						26
27	WAREHOUSE NORTH	2320	3/4"2-#8,1-#12G	20/2	B						28
29					C						30
31	WAREHOUSE NORTH C	2550	3/4"2-#8,1-#12G	20/2	A						32
33					B						34
35	WAREHOUSE SOUTH	2784	3/4"2-#8,1-#12G	20/2	C						36
37					A						38
39	TRUCK BOX LTS	750	3/4"2-#10,1-#12G	20/1	B						40
41					C						42

CONNECTED LOAD = 29638 VA  
CONNECTED LOAD = 87.325 AMPS

PHASE A = 11000 VA    PHASE B = 8970 VA    PHASE C = 9668 VA



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**FBC Elections Administration Building**

3700 BAMBRE ROAD  
ROSENBERG, TX 77471  
FOR BID AND PERMIT

A B

KEY PLAN  
PLAN NORTH    TRUE NORTH

Project No.:

Drawing Date:  
Drawn: C.R.C.  
Checked: R.B.W.  
Scale: AS NOTED

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FBC Elections Administration Building

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ROSENBERG, TX 77471  
FOR BID AND PERMIT

A B

KEY PLAN  
PLAN NORTH  
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ELECTRICAL LIGHTING PLAN  
WAREHOUSE  
**E1.1**



**Lighting Fixture Schedule** **FBC ADMINISTRATION**

MARK	MANUFACTURER AND MODEL	VOLTAGE	LAMPS	INPUT WATTAGE	MOUNTING	DESCRIPTION
A1	H.E. WILLIAMS # LT-22-L39-835-AF-DIM-UNV	120/277	INTEGRAL LED 3500K, 80+ CRI 3900 LUMENS	33.1W	RECESSED	2X2 LED TROFFER
A1E	H.E. WILLIAMS # LT-22-L39-835-AF-EM/10W-DIM-UNV	120/277	INTEGRAL LED 3500K, 80+ CRI 3900 LUMENS	33.1W	RECESSED	SAME AS TYPE "A1" WITH 10-WATT EMERGENCY BATTERY
C-LOW	LEDI # CB1-15-35-LENGTH	120/277	INTEGRAL LED 3500K, 90 CRI 145 LUMENS/FT	1.5W/FT	SURFACE	COB LED TAPE LIGHT. TO BE MOUNTED IN COVE
D	H.E. WILLIAMS # 4DR-TL-L10-835-DIM-UNV-OW-OF-CS	120/277	INTEGRAL LED 3500K, 80+ CRI 1000 LUMENS	9W	RECESSED	4" ROUND DOWNLIGHT
DE	H.E. WILLIAMS # 4DR-TL-L10-835-EM/7W-DIM-UNV-OW-OF-CS	120/277	INTEGRAL LED 3500K, 80+ CRI 1000 LUMENS	9W	RECESSED	SAME AS TYPE "D" WITH 7-WATT EMERGENCY BATTERY
D1	H.E. WILLIAMS # 4DR-TL-L15-835-DIM-UNV-OW-OF-CS	120/277	INTEGRAL LED 3500K, 80+ CRI 1500 LUMENS	13.9W	RECESSED	4" ROUND DOWNLIGHT
D1E	H.E. WILLIAMS # 4DR-TL-L15-835-EM/7W-DIM-UNV-OW-OF-CS	120/277	INTEGRAL LED 3500K, 80+ CRI 1500 LUMENS	13.9W	RECESSED	SAME AS TYPE "D1" WITH 7-WATT EMERGENCY BATTERY.
L1-LOW	H.E. WILLIAMS # MX2RG-4'00-L4/835-F-DIM-UNV	120/277	INTEGRAL LED 3500K, 80+ CRI 400 LUMENS/FT	3.4W/FT	RECESSED	2" LED LINEAR. RUN LENGTH TO BE CONFIRMED BY CONTRACTOR
L1-LOW-E	H.E. WILLIAMS # MX2RG-4'00-L4/835-F-EM/10WLP-DIM-UNV	120/277	INTEGRAL LED 3500K, 80+ CRI 400 LUMENS/FT	3.4W/FT	RECESSED	SAME AS TYPE "L1-LOW" WITH 10-WATT EMERGENCY BATTERY
L1-MED	H.E. WILLIAMS # MX2RG-6'00-L8-835-F-DIM-UNV	120/277	INTEGRAL LED 3500K, 80+ CRI 800 LUMENS/FT	6.7W/FT	RECESSED	2" LED LINEAR. RUN LENGTH TO BE CONFIRMED BY CONTRACTOR
L1-MED-E	H.E. WILLIAMS # MX2RG-6'00-L8-835-F-EM/10WLP-DIM-UNV	120/277	INTEGRAL LED 3500K, 80+ CRI 800 LUMENS/FT	6.7W/FT	RECESSED	SAME AS TYPE "L1-MED" WITH 10-WATT EMERGENCY BATTERY
S	H.E. WILLIAMS # 75R-4-L30-840-DIM-UNV	120/277	INTEGRAL LED 4000K, 80+ CRI 3000 LUMENS	19.7W	SURFACE	4" LED STRIP
V	TBD	TBD	TBD	TBD	TBD	TBD
1P2	LSI # SLM-LED-24L-SIL-2-UNV-40-70CRI-BLK LSI # SSQ-B3-S11G-25-S-BLK	120/277	INTEGRAL LED 4000K, 80+ CRI 23361 LUMENS	161W	POLE	AREA LED TO BE MOUNTED ON 25' POLE ON 30" CONCRETE BASE
1PFT	LSI # SLM-LED-24L-SIL-FIT-UNV-40-70CRI-BLK LSI # SSQ-B3-S11G-25-S-BLK	120/277	INTEGRAL LED 4000K, 80+ CRI 24059 LUMENS	161W	POLE	AREA LED TO BE MOUNTED ON 25' POLE ON 30" CONCRETE BASE
4PFT	LSI # SLM-LED-24L-SIL-FIT-UNV-40-70CRI-BLK LSI # SSQ-B3-S11G-25-Q90-BLK	120/277	INTEGRAL LED 4000K, 80+ CRI 24059 LUMENS	161W	POLE	(4) AREA LED TO BE MOUNTED ON 25' POLE ON 30" CONCRETE BASE
DW	H.E. WILLIAMS # 4DR-TL-L15-840-DIM-UNV-OW-OF-CS-WET/CC-N-F1	120/277	INTEGRAL LED 3500K, 80+ CRI 1500 LUMENS	13.9W	RECESSED	4" ROUND DOWNLIGHT SUITABLE FOR WET LOCATION
DWE	H.E. WILLIAMS # 4DR-TL-L15-840-EM/7W-DIM-UNV-OW-OF-CS-WET/CC-N-F1	120/277	INTEGRAL LED 3500K, 80+ CRI 1500 LUMENS	13.9W	RECESSED	SAME AS TYPE "DW" WITH 7-WATT EMERGENCY BATTERY
H1	H.E. WILLIAMS # GS-4-L240-835-CA-VBY-2-DIM-UNV	120/277	INTEGRAL LED 3500K, 80+ CRI 24420 LUMENS	169W	SUSPENDED	SLIM HIGH BAY
F	LSI # XFLM-MF-LED-28-HO-CW-UNV-BRZ-BKA-XFLM-SMC-23"-BRZ	120/277	INTEGRAL LED 3500K, 80+ CRI 2470 LUMENS	36W	STANCHION MOUNTED	FLAG POLE LIGHT
WP2	LSI # SLM-LED-09L-SIL-2-UNV-DIM-40-70CRI-BLK LSI # BKS-XBO-WM CLR	120/277	INTEGRAL LED 4000K, 80+ CRI 9411 LUMENS	62W	WALL MOUNTED	WALL MOUNTED AREA LED
WPFT	LSI # SLM-LED-09L-SIL-FIT-UNV-DIM-40-70CRI-BLK LSI # BKS-XBO-WM CLR	120/277	INTEGRAL LED 4000K, 80+ CRI 9464 LUMENS	62W	WALL MOUNTED	WALL MOUNTED AREA LED

NOTES:  
1. CONFIRM LAMP COLOR TEMPERATURE AND FIXTURE FINISHES WITH OWNER'S REPRESENTATIVE.  
2. QUESTIONS REGARDING LIGHTING FIXTURE PACKAGE - CONTACT SAMI BAILEY AT BELL & MCCOY - 832.475.4291

**1** ELECTRICAL LIGHTING PLAN - WAREHOUSE  
SCALE: 3/32"=1'-0"



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FBC Elections Administration Building

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FOR BID AND PERMIT

A B

KEY PLAN

PLAN NORTH  
TRUE NORTH

Project No.:

Drawing Date:

Drawn: C.R.C.  
Checked: R.B.W.  
Scale: AS NOTED

Issue Log:

No.	Descriptor	Date

Revisions:

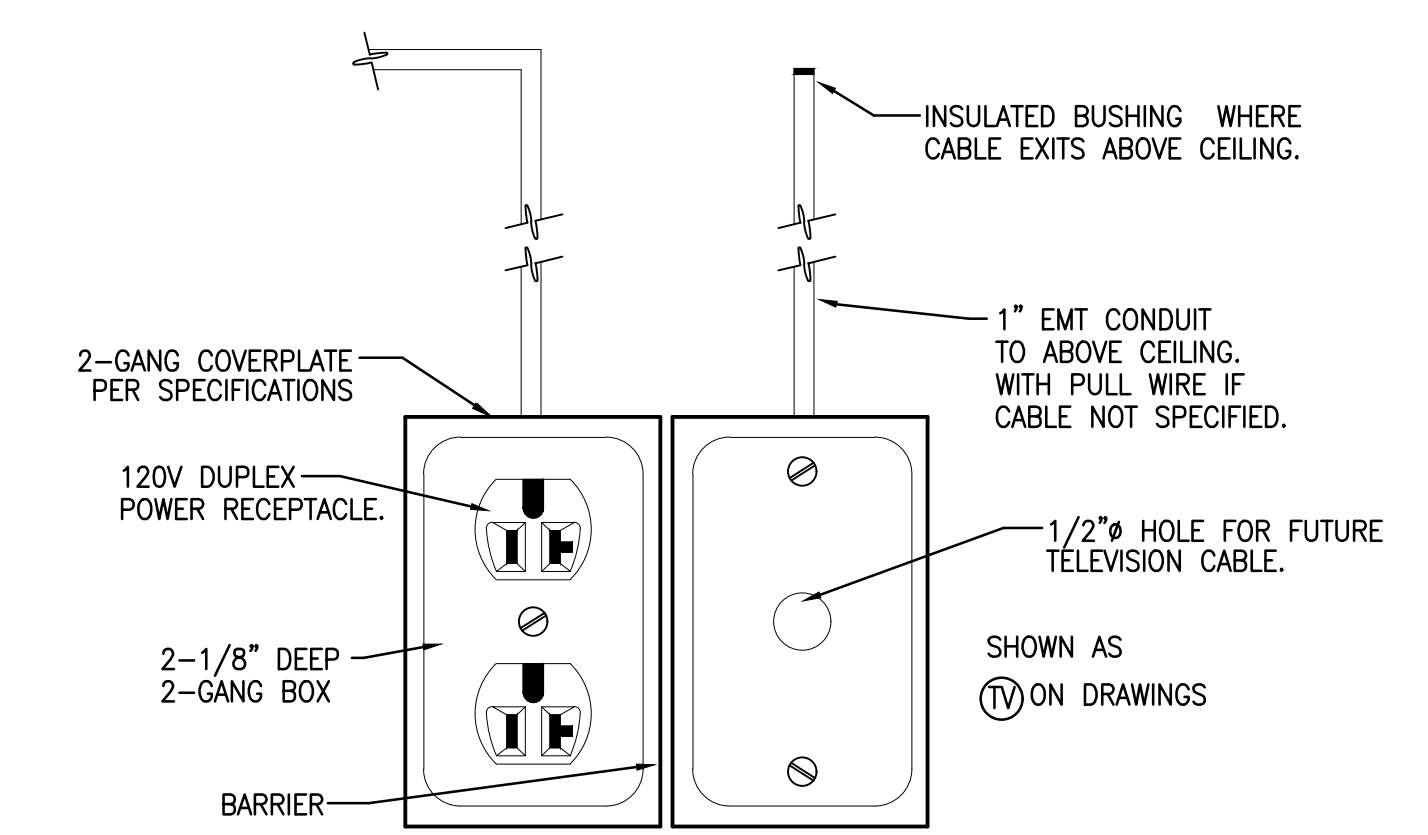
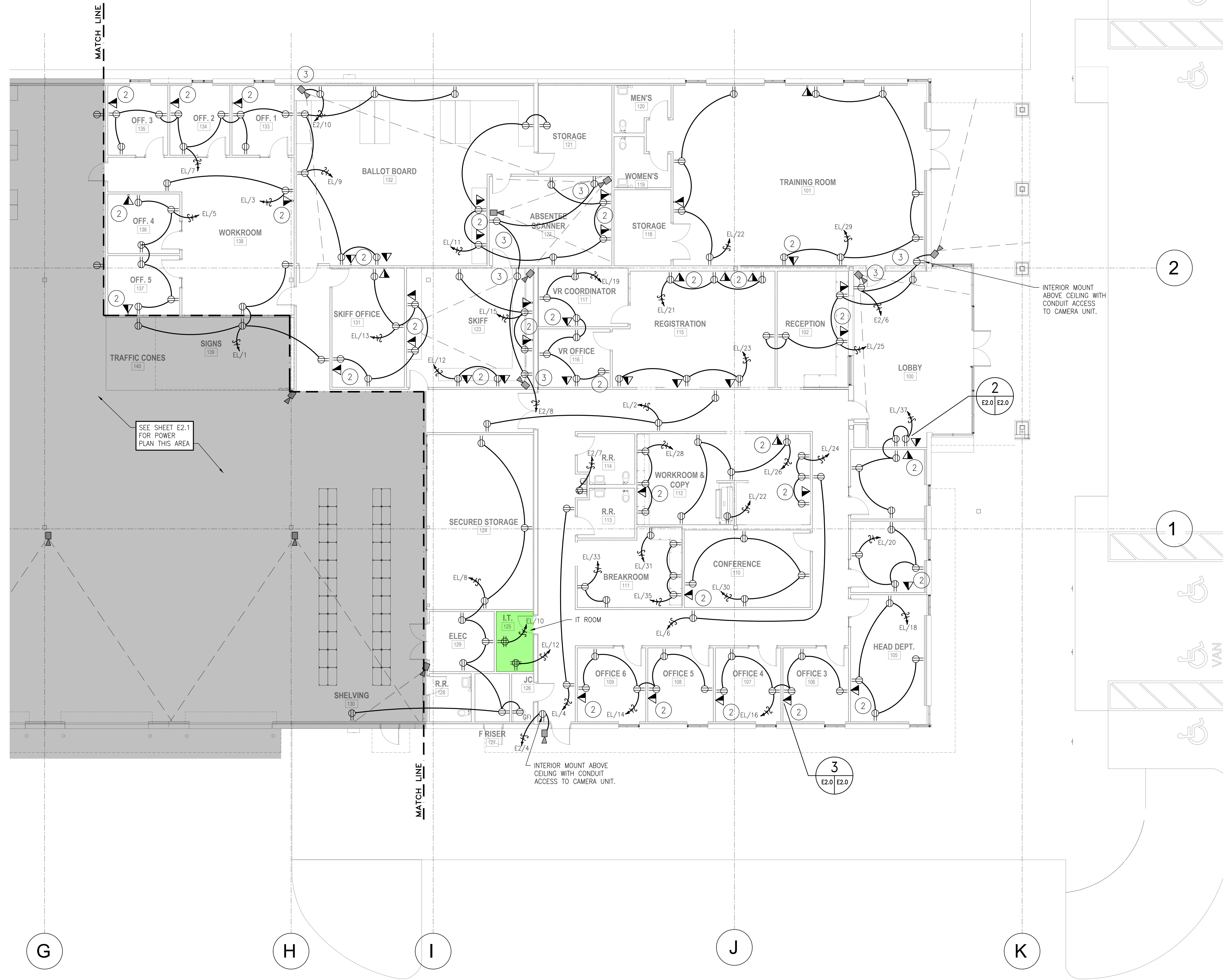
No.	Description	Date

KEYNOTES:

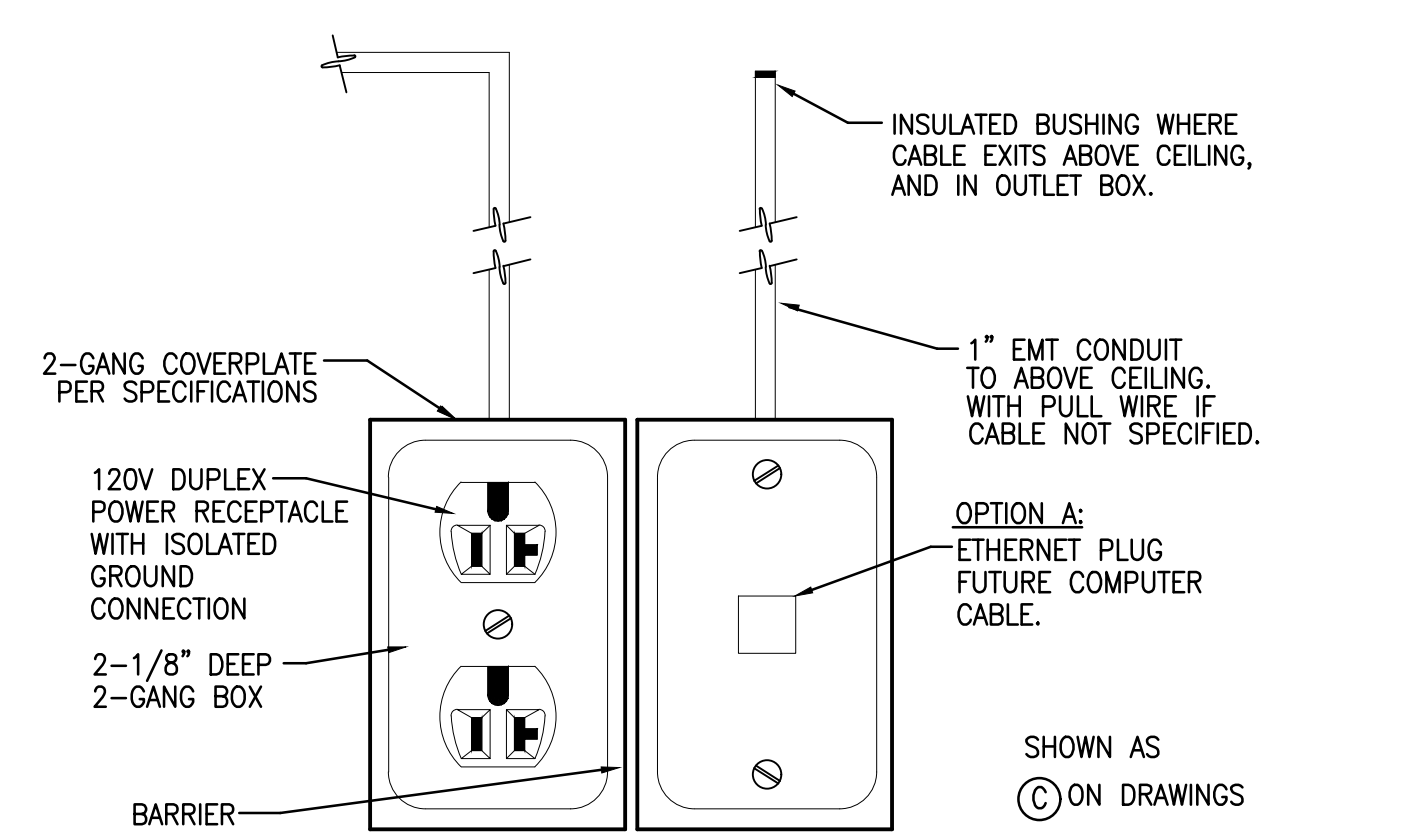
- PROVIDE RETRACTING CORD REEL, 120V, 20 AMP WITH QUAD PLUG OUTLET, UNIT SHALL MOUNT BUILDING STRUCTURE. PROVIDE MOUNTS AND EXTEND STEEL AS REQUIRED. PROVIDE REEL CRAFT UNIT MODEL L550-123-700, WITH NEMA 5-20P OUTLET, NEMA-LS-20P TWIST LOCK INLET, 50 FT SJEOW CORD, INCLUDE REELCRAFT MODEL 5600608 - 340° PIVOT BASE FOR MOUNTING. PROVIDE 2x4 J-BOX STRUCTURE MOUNTED AT UNIT WITH NEMA-LS-20P, RECEPTACLE HOME RUN POWER TO PANEL INDICATED. MAINTAIN 3% MAXIMUM VOLTAGE DROP ON CONDUCTOR.
- PROVIDE CONDUIT ACCESS, 3/4"Ø, EMT FROM DATA POINT INDICATED BACK TO IT RM 125. PROVIDE MULE TAPE PULL STRONG, NETWORK CABLE AND TERMINATION BY OTHERS.
- PROVIDE 120V PLUG POWER TO CAMERA, VERIFY UNITS DO NOT USE POWER OVER I.P.. PROVIDE ALL POWER ON EMERGENCY CIRCUITS THROUGH PANEL E2. CEILING MOUNT PLUGS ON BUILDING STRUCTURE. CCTV CONTRACTOR SHALL PROVIDE TRANSFORMER/ADAPTER TO MATCH CAMERA INLET. PROVIDE 3/4" CONDUIT TO IT RM 125, WITH MULE TAPE PULL STRING, CCTV CABLE/NETWORK CABLE BY OTHERS.

**WIRING DEVICE LEGEND AND SCHEDULE**  
REFER TO SPECS FOR COLOR AND MATERIAL

SYMBOL	CHARACTERISTICS	RATING	VOLTS	AMPS	DESCRIPTION	P. & S.	LEVITON	REMARKS
S	SPST	120-277	20		SINGLE POLE SWITCH	20AC1-I	1221-I	
S2	DPST	120-277	20		DOUBLE POLE SWITCH	20AC2-I	1222-I	
S3	3-WAY	120-277	20		THREE-WAY SWITCH	20AC3-I	1223-I	
S4	4-WAY	120-277	20		FOUR-WAY SWITCH	20AC4-I	1224-I	
Sp	SPST-PILOT LIGHT	120-277	20		SINGLE POLE SWITCH WITH INTEGRAL PILOT LIGHT	20AC1-CPL	1221-7PG	NORMALLY "OFF"
Sp2	SPST-PILOT LIGHT	120-277	20		SINGLE POLE SWITCH WITH INTEGRAL PILOT LIGHT	20AC1-ISL	---	NORMALLY "ON"
S5S	SPST-DOOR SWITCH	120	6		DOOR SWITCH	1200	---	"ON" ON DOOR OPEN "OFF" ON DOOR CLOSED
S5	ELECTRONIC DIMMER	120	---	---	SINGLE POLE SLIDE DIMMER SWITCH	860800-I	---	800 WATTS UNLESS NOTED
Sp5P	SPST-WEATHERPROOF	120-277	20		SINGLE POLE SWITCH-WEATHERPROOF	2221/4515	---	
S5	SPST-KEYED	120-277	20		SINGLE POLE SWITCH-KEY LOCK	20AC1-L	1221-IL	
CO	NEMA 5-15R	125	15		DUPLEX CONVENIENCE OUTLET	5252-I	5252-I	
CO	NEMA 5-20R	125	20		DUPLEX ISOL. GND RECEPTACLE	19 8350	5362-IG	ORANGE OR SS PLATE TO MATCH SPECS
CO	UL 1449	125	20		DUPLEX SURGE SUPPRESSOR RECEPTACLE	5380-I	---	
CO	NEMA 5-20R	125	20		GRD RECEPTACLE	2091-F1	6899-I	
CO	NEMA 5-15R	125	15		SINGLE CLOCK OUTLET RECEPTACLE	2123	658	
CO	NEMA 5-15R	125	15		DUPLEX CONVENIENCE OUTLET WEATHERPROOF	6207	---	WP LOCKING COVER
CO	NEMA 5-20R	125	20		HEAVY DUTY CONVENIENCE OUTLET	5352-I	5352	
CO	NEMA 6-20R	250	20		SINGLE 50 VOLT 3-WIRE GROUNDING RECEPTACLE	5351-I	5461-I	
CO	NEMA 14-20R	125/250	20		SINGLE PHASE, 3-WIRE, GRND RECEPTACLE	5331	---	
CO	NEMA 14-30R	125/250	30		SINGLE PHASE, 3-WIRE, GRND RECEPTACLE	5744	278	
CO	NEMA 14-50R	125/250	50		SINGLE PHASE, 3-WIRE, GRND RECEPTACLE	5754	279	
CO	NEMA 14-60R	125/250	60		SINGLE PHASE, 3-WIRE, GRND RECEPTACLE	9460	---	
CO	NEMA 18-20R	120/208	20		2-PHASE, 4-WIRE, 4-POLE RECEPTACLE	7250	---	
CO	NEMA 18-30R	120/208	30		2-PHASE, 4-WIRE, 4-POLE RECEPTACLE	8330	---	
CO	NEMA 18-50R	120/208	50		2-PHASE, 4-WIRE, 4-POLE RECEPTACLE	8350	---	
CO	NEMA 18-60R	120/208	60		2-PHASE, 4-WIRE, 4-POLE RECEPTACLE	8301	---	



**2 DUPLEX AND TELEVISION OUTLET DETAIL**  
NOT TO SCALE



**3 DUPLEX AND COMPUTER OUTLET DETAIL**  
NOT TO SCALE

OPTION B: QUAD BOX FOR CATEGORY 5 (NO POWER)  
OPTION C: FOUR MODULAR SPACE SINGLE GANG FACE PLATE WITH 4 KRONE 7568B MODULAR JACKS SHOWN AS:

**ELECTRICAL POWER PLAN - ADMINISTRATION**  
SCALE: 1/8"=1'-0"

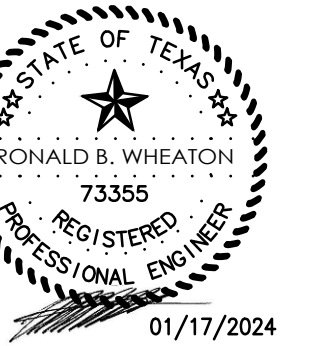
PANEL 'E2'												
100 AMP, M.C.B., 120Y/208V, 3PH, 4W, SURFACE, NEMA I, 45 KAIC												
CKT #	LOAD SERVED	LOAD	CONDUIT & WIRE SIZE	BKR SIZE	A	B	C	BKR SIZE	CONDUIT & WIRE SIZE	LOAD	LOAD SERVED	CKT #
1	WH RM 125	3000	3/4"Ø, 2-#10, 1-#12G	30/1	A	B	C	3/4"Ø, 2-#12, 1-#12G	300	CAMERAS WAREHOUSE	2	2
3	WH RM 126	3000	3/4"Ø, 2-#10, 1-#12G	30/1	A	B	C	3/4"Ø, 2-#12, 1-#12G	100	CAMERAS SOUTH	4	4
5	TRUCK ACCESS LT	600	3/4"Ø, 2-#12, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#12, 1-#12G	200	CAMERAS EAST	6	6
7	DRINKING FOUNTAIN	1100	3/4"Ø, 2-#12, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#12, 1-#12G	400	CAMERAS RIFF	8	8
9					A	B	C	3/4"Ø, 2-#12, 1-#12G	100	CAMERAS BALLOT	10	10
11					A	B	C					12
13					A	B	C					14
15					A	B	C					16
17					A	B	C					18
19					A	B	C					20
21					A	B	C					22
23					A	B	C					24
25					A	B	C					26
27					A	B	C					28
29					A	B	C					30
31					A	B	C					32
33					A	B	C					34
35					A	B	C					36
37					A	B	C					38
39					A	B	C					40
41					A	B	C					42

CONNECTED LOAD = 8800 VA    PHASE A = 4800 VA    PHASE B = 3200 VA    PHASE C = 800 VA  
CONNECTED LOAD = 24.44 AMP

PANEL 'E1'												
200 AMP, M.C.B., 120Y/208V, 3PH, 4W, SURFACE, NEMA I, 45 KAIC												
CKT #	LOAD SERVED	LOAD	CONDUIT & WIRE SIZE	BKR SIZE	A	B	C	BKR SIZE	CONDUIT & WIRE SIZE	LOAD	LOAD SERVED	CKT #
1	SIGN/WORK ROOM PG	1000	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	500	CORRIDOR 119 PG	2	2
3	WORK 140 PG	1000	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	500	CORRIDOR 146 PG	4	4
5	OFF PG 141, 142	800	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	500	CORRIDOR 102/106 PG	6	6
7	OFF PG 143, 145	800	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	500	SECOND ST. PG	8	8
9	BALLOT RM PG	800	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	1500	IT GUARD	10	10
11	BALLOT RM PG	800	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	1500	IT GUARD	12	12
13	SHOFF PG	800	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	800	OFF 109, 110 PG	14	14
15	SHOFF PG	800	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	800	OFF 107, 108 PG	16	16
17	SHOFF PG	800	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	800	HEAD OFF 105 PG	18	18
19	VR OFF PG	800	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	800	OFF 101, 104 PG	20	20
21	REG PG	800	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	1500	RM 114, COPY PG	22	22
23	REG PG	800	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	1000	RM 116, PRINT	24	24
25	REG PG	800	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	800	WORK 118 PG	26	26
27	TRAINING PG	800	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	800	WORK 118 PG	28	28
29	TRAINING PG	800	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	800	CONFERENCE 115 PG	30	30
31	REFRIG. 114 PG	800	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	800	LOBBY TV PG	32	32
33	MICRO 114 PG	1100	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	3000	WH RM 111	34	34
35	BREAK RM 114 PG	800	3/4"Ø, 2-#10, 1-#12G	20/1	A	B	C	3/4"Ø, 2-#10, 1-#12G	3000	WH RM 114	36	36
37		5000			A	B	C	3/4"Ø, 2-#10, 1-#12G	3000	WH RM 119	38	38
39	PANEL E2	5000	1.1/2"Ø, 4-#1, 1-#8G	100/3	A	B	C	3/4"Ø, 2-#10, 1-#12G	3000	WH RM 120	40	40
41		5000			A	B	C	3/4"Ø, 2-#10, 1-#12G	3000	WH RM 120	42	42

CONNECTED LOAD = 56000 VA    PHASE A = 17200 VA    PHASE B = 21400 VA    PHASE C = 17400 VA  
CONNECTED LOAD = 155.56 AMP

**ELECTRICAL POWER PLAN ADMINISTRATION E2.0**



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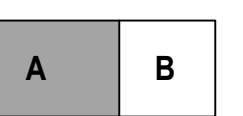
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FOR BID AND PERMIT



**KEY PLAN**  
PLAN NORTH  
TRUE NORTH

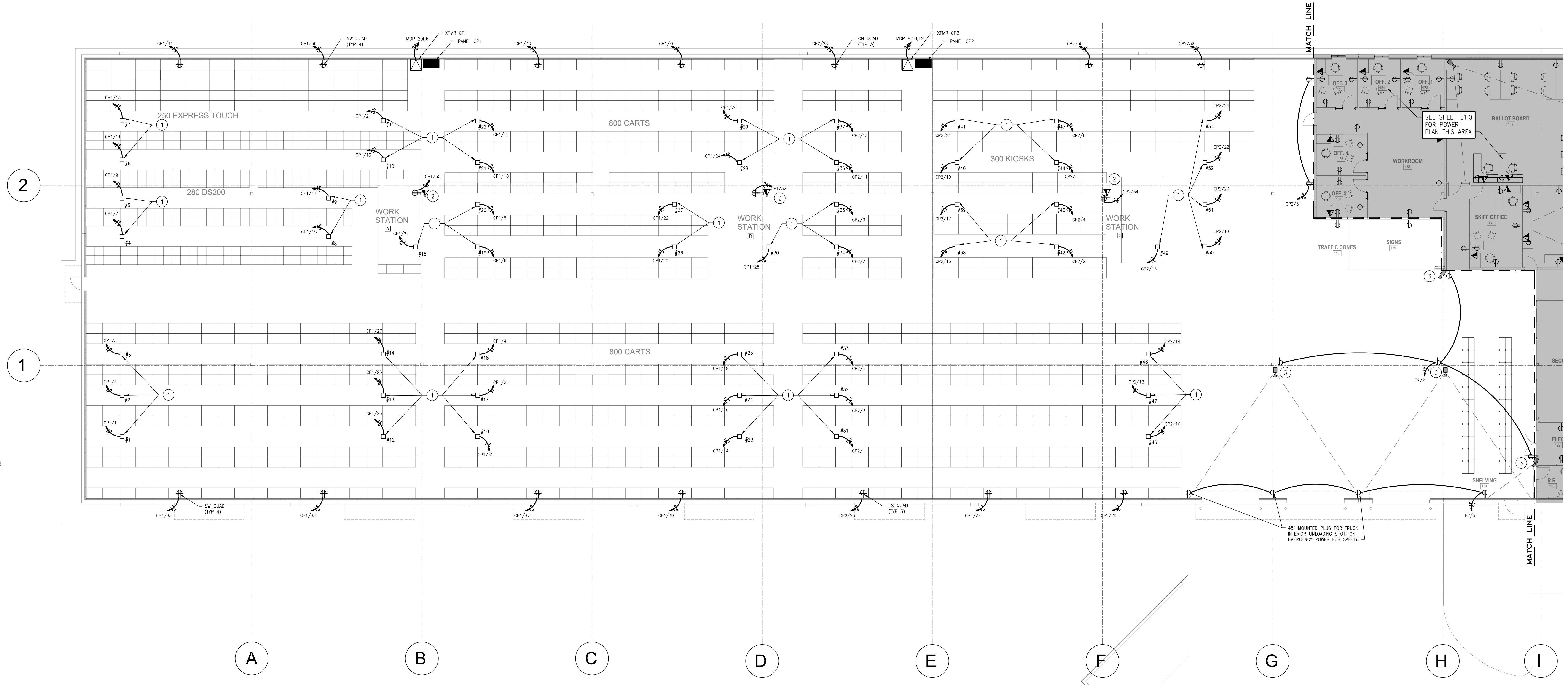
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Drawing Date: .  
Drawn by: C.R.C.  
Checked: R.B.W.  
Scale: AS NOTED

Issue Log:  
No. Descriptor Date

Revisions:  
No. Description Date

**ELECTRICAL POWER PLAN WAREHOUSE**  
**E2.1**



**ELECTRICAL POWER PLAN – WAREHOUSE**  
SCALE: 3/32"=1'-0"

PANEL 'CP1'												
200 AMP, M.C.B., 120Y208V, 3PH, 4W, SURFACE, NEMA 1, 45 KAIC												
CKT #	LOAD SERVED	LOAD	CONDUIT & WIRE SIZE	BKR SIZE	A	B	C	BKR SIZE	CONDUIT & WIRE SIZE	LOAD	LOAD SERVED	CKT #
1	REEL #1	1500	3/4"C, 2-#10, 1-#126	20/1	A	B	C	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #17	2
3	REEL #2	1500	3/4"C, 2-#10, 1-#126	20/1	B	C	A	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #18	4
5	REEL #3	1500	3/4"C, 2-#10, 1-#126	20/1	C	A	B	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #19	6
7	REEL #4	1500	3/4"C, 2-#10, 1-#126	20/1	A	B	C	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #20	8
9	REEL #5	1500	3/4"C, 2-#10, 1-#126	20/1	B	C	A	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #21	10
11	REEL #6	1500	3/4"C, 2-#10, 1-#126	20/1	C	A	B	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #22	12
13	REEL #7	1500	3/4"C, 2-#10, 1-#126	20/1	A	B	C	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #23	14
15	REEL #8	1500	3/4"C, 2-#10, 1-#126	20/1	B	C	A	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #24	16
17	REEL #9	1500	3/4"C, 2-#10, 1-#126	20/1	C	A	B	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #25	18
19	REEL #10	1500	3/4"C, 2-#10, 1-#126	20/1	A	B	C	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #26	20
21	REEL #11	1500	3/4"C, 2-#10, 1-#126	20/1	B	C	A	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #27	22
23	REEL #12	1500	3/4"C, 2-#10, 1-#126	20/1	C	A	B	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #28	24
25	REEL #13	1500	3/4"C, 2-#10, 1-#126	20/1	A	B	C	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #29	26
27	REEL #14	1500	3/4"C, 2-#10, 1-#126	20/1	B	C	A	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #30	28
29	REEL #15	1500	3/4"C, 2-#10, 1-#126	20/1	C	A	B	20/1	3/4"C, 2-#10, 1-#126	1500	WORKSTATION A	30
31	REEL #16	1500	3/4"C, 2-#10, 1-#126	20/1	A	B	C	20/1	3/4"C, 2-#10, 1-#126	1500	WORKSTATION B	32
33	SW QUAD	1500	3/4"C, 2-#10, 1-#126	20/1	B	C	A	20/1	3/4"C, 2-#10, 1-#126	1500	NW QUAD	34
35	SW QUAD	1500	3/4"C, 2-#10, 1-#126	20/1	C	A	B	20/1	3/4"C, 2-#10, 1-#126	1500	NW QUAD	36
37	SW QUAD	1500	3/4"C, 2-#10, 1-#126	20/1	A	B	C	20/1	3/4"C, 2-#10, 1-#126	1500	NW QUAD	38
39	SW QUAD	1500	3/4"C, 2-#10, 1-#126	20/1	B	C	A	20/1	3/4"C, 2-#10, 1-#126	1500	NW QUAD	40
41					C	A	B				NW QUAD	42

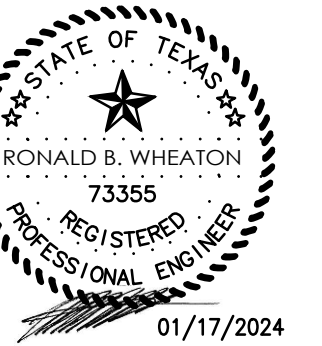
CONNECTED LOAD = 59500 VA  
CONNECTED LOAD = 166.28 AMPS  
PHASE A = 20500 VA    PHASE B = 21000 VA    PHASE C = 18000 VA

PANEL 'CP2'												
200 AMP, M.C.B., 120Y208V, 3PH, 4W, SURFACE, NEMA 1, 45 KAIC												
CKT #	LOAD SERVED	LOAD	CONDUIT & WIRE SIZE	BKR SIZE	A	B	C	BKR SIZE	CONDUIT & WIRE SIZE	LOAD	LOAD SERVED	CKT #
1	REEL #31	1500	3/4"C, 2-#10, 1-#126	20/1	A	B	C	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #42	2
3	REEL #32	1500	3/4"C, 2-#10, 1-#126	20/1	B	C	A	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #43	4
5	REEL #33	1500	3/4"C, 2-#10, 1-#126	20/1	C	A	B	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #44	6
7	REEL #34	1500	3/4"C, 2-#10, 1-#126	20/1	A	B	C	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #45	8
9	REEL #35	1500	3/4"C, 2-#10, 1-#126	20/1	B	C	A	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #46	10
11	REEL #36	1500	3/4"C, 2-#10, 1-#126	20/1	C	A	B	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #47	12
13	REEL #37	1500	3/4"C, 2-#10, 1-#126	20/1	A	B	C	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #48	14
15	REEL #38	1500	3/4"C, 2-#10, 1-#126	20/1	B	C	A	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #49	16
17	REEL #39	1500	3/4"C, 2-#10, 1-#126	20/1	C	A	B	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #50	18
19	REEL #40	1500	3/4"C, 2-#10, 1-#126	20/1	A	B	C	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #51	20
21	REEL #41	1500	3/4"C, 2-#10, 1-#126	20/1	B	C	A	20/1	3/4"C, 2-#10, 1-#126	1500	REEL #52	22
23					C	A	B				REEL #53	24
25	CS QUAD	1500	3/4"C, 2-#10, 1-#126	20/1	A	B	C					26
27	CS QUAD	1500	3/4"C, 2-#10, 1-#126	20/1	B	C	A					28
29	CS QUAD	1500	3/4"C, 2-#10, 1-#126	20/1	C	A	B					30
31	EAST WALL	1000	3/4"C, 2-#10, 1-#126	20/1	A	B	C					32
33					B	C	A					34
35					C	A	B					36
37					A	B	C					38
39					B	C	A					40
41					C	A	B					42

CONNECTED LOAD = 45500 VA  
CONNECTED LOAD = 126.39 AMPS  
PHASE A = 16000 VA    PHASE B = 16000 VA    PHASE C = 13500 VA

- KEYNOTES:
- PROVIDE RETRACTING CORD REEL, 120V, 20 AMP WITH QUAD PLUG OUTLET, UNIT SHALL MOUNT BUILDING STRUCTURE. PROVIDE MOUNTS AND EXTEND STEEL AS REQUIRED. PROVIDE REEL CRAFT UNIT MODEL LS550-123-70C, WITH NEMA 5-20R OUTLET, NEMA-LS-20P TWIST LOCK INLET, 50 FT SUEDEW CORD, INCLUDE REELCRAFT MODEL 5600608 - 340" PIVOT BASE FOR MOUNTING. PROVIDE 2X4 J-BOX STRUCTURE MOUNTED AT UNIT WITH NEMA-LS-20P RECEPTACLE HOME RUN POWER TO PANEL INDICATED. MAINTAIN 3% MAXIMUM VOLTAGE DROP ON CONDUCTOR.
  - PROVIDE CONDUIT ACCESS, 3/4" EMT FROM DATA POINT INDICATED BACK TO IT RM 125. PROVIDE MULE TAPE PULL STRONG, NETWORK CABLE AND TERMINATION BY OTHERS.
  - PROVIDE 120V PLUG POWER TO CAMERA, VERIFY UNITS DO NOT USE POWER OVER I.P.. PROVIDE ALL POWER ON EMERGENCY CIRCUITS THROUGH PANEL E2. CEILING MOUNT PLUGS ON BUILDING STRUCTURE. CCTV CONTRACTOR SHALL PROVIDE TRANSFORMER/ADAPTER TO MATCH CAMERA INLET. PROVIDE 3/4" CONDUIT TO IT RM 125, WITH MULE TAPE PULL STRING. CCTV CABLE/NETWORK CABLE BY OTHERS.





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**FBC Elections Administration Building**

3700 BAMBRE ROAD  
ROSENBERG, TX 77471  
FOR BID AND PERMIT

A B

KEY PLAN  
PLAN NORTH TRUE NORTH

Project No.:

Drawing Date: C.R.C.  
Checked: R.B.W.  
Scale: AS NOTED

Issue Log:

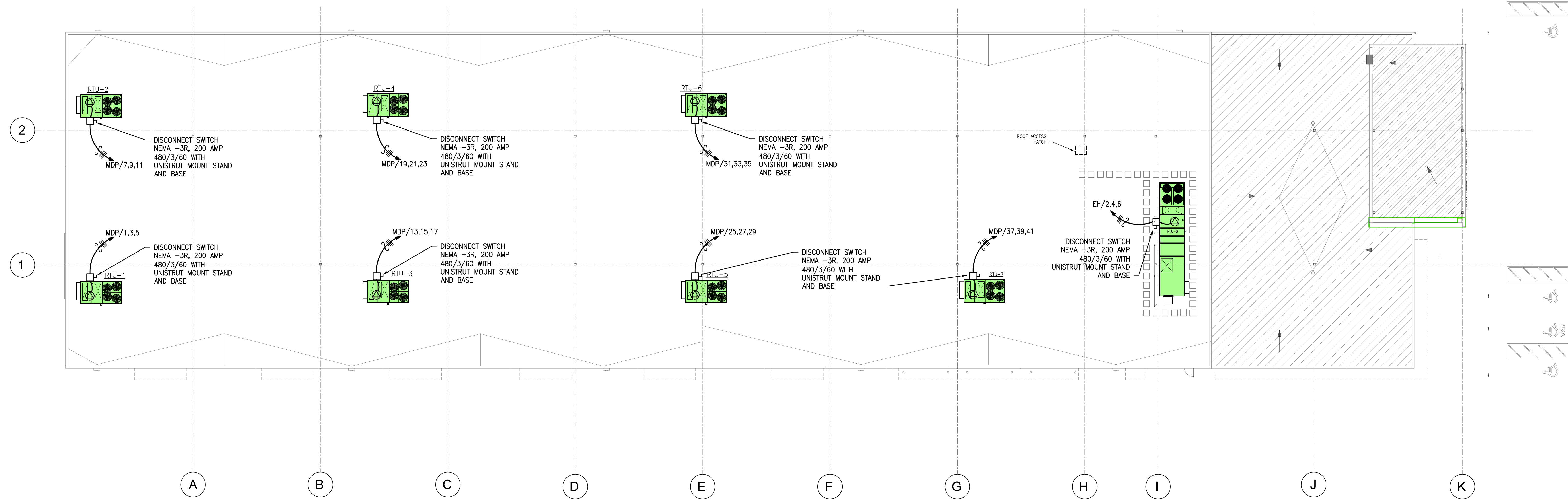
No.	Descriptor	Date

Revisions:

No.	Description	Date

**ELECTRICAL  
ROOF PLAN**

**E2.2**



**1 ELECTRICAL ROOF PLAN**  
SCALE: 1/16"=1'-0"



**2 ELECTRICAL MECHANICAL EQUIPMENT PLAN**  
SCALE: 1/8"=1'-0"

KEY NOTES:

1. PROVIDE 480/3/60 POWER CIRCUIT TO VAV BOX GROUPS. PROVIDE J-BOX AND CONTINUOUS CIRCUIT. FEED EACH VAV FUSED DISCONNECT THROUGH J-BOX. FULL CIRCUIT CONDUCTOR VAV WILL BE PROTECTED BY FUSE SYSTEM. MEET NEC DISCONNECT REQUIREMENTS. CONDUCTOR AND CIRCUIT PROTECT FROM PANEL BREAKER.
2. PROVIDE NEMA-3R DISCONNECT ON ROOF. CONNECT EF UNIT TO LIGHTING CIRCUIT TO BE CONTROL THROUGH LP, MOTION DETECTOR. ROUTE 3/4", 2-#12, 1-#12G TO SWITCH.
3. PROVIDE INSTA-HOT WATER HEATER, 120V, 30 AMP GFCI PLUG, MAX LOAD 2.4KW.

PANEL 'MDP'												
1200 AMP, M.C.B., 277Y480V, 3PH, 4W, SURFACE, NEMA 1, 60 KAIC												
CKT #	LOAD SERVED	LOAD	CONDUIT & WIRE SIZE	BKR SIZE	A	B	C	BKR SIZE	CONDUIT & WIRE SIZE	LOAD	LOAD SERVED	CKT #
1	-	21000	-	-	A	B	C	100/0	1 1/2" C, 4 #1, 1 #8G	21000	-	2
3	RTU-1	21000	1 1/2" C, 4 #2, 1 #8G	110/0	B	C	A	100/0	1 1/2" C, 4 #1, 1 #8G	21000	XFRM-CP1	4
5	-	21000	-	-	A	B	C	-	-	21000	-	6
7	-	21000	-	-	A	B	C	-	-	18000	-	8
9	RTU-2	21000	1 1/2" C, 4 #2, 1 #8G	110/0	B	C	A	100/0	1 1/2" C, 4 #1, 1 #8G	16000	XFRM-CP2	10
11	-	21000	-	-	A	B	C	-	-	16000	-	12
13	-	21000	-	-	A	B	C	-	-	108000	-	14
15	RTU-3	21000	1 1/2" C, 4 #2, 1 #8G	110/0	B	C	A	600/0	2 3/4" C, 4 #00KCMIL, 1 #4/0G	108000	PANEL-EH	16
17	-	21000	-	-	A	B	C	-	-	108000	-	18
19	-	21000	-	-	A	B	C	-	-	-	-	20
21	RTU-4	21000	1 1/2" C, 4 #2, 1 #8G	110/0	B	C	A	-	-	-	-	22
23	-	21000	-	-	A	B	C	-	-	-	-	24
25	-	21000	-	-	A	B	C	-	-	-	-	26
27	RTU-5	21000	1 1/2" C, 4 #2, 1 #8G	110/0	B	C	A	-	-	-	-	28
29	-	21000	-	-	A	B	C	-	-	-	-	30
31	-	21000	-	-	A	B	C	-	-	-	-	32
33	RTU-6	21000	1 1/2" C, 4 #2, 1 #8G	110/0	B	C	A	-	-	-	-	34
35	-	21000	-	-	A	B	C	-	-	-	-	36
37	-	21000	-	-	A	B	C	-	-	-	-	38
39	RTU-7	21000	1 1/2" C, 4 #2, 1 #8G	110/0	B	C	A	-	-	-	-	40
41	-	21000	-	-	A	B	C	-	-	-	-	42
CONNECTED LOAD = 920100 VA PHASE A = 306700 VA PHASE B = 306700 VA PHASE C = 306700 VA												
CONNECTED LOAD = <b>1108.6</b> AMPS												

PANEL 'EH'												
600 AMP, M.C.B., 277Y480V, 3PH, 4W, SURFACE, NEMA 1, 60 KAIC												
CKT #	LOAD SERVED	LOAD	CONDUIT & WIRE SIZE	BKR SIZE	A	B	C	BKR SIZE	CONDUIT & WIRE SIZE	LOAD	LOAD SERVED	CKT #
1	-	11000	-	-	A	B	C	150/0	2 1/2" C, 4 #1, 0, 1 #8G	34270	-	2
3	VAV-1,2	11000	1" C, 4 #6, 1 #10G	60/0	B	C	A	-	-	34270	RTU-8	4
5	-	11000	-	-	A	B	C	-	-	34270	-	6
7	-	18100	-	-	A	B	C	-	-	-	-	8
9	VAV-3,4,5	18100	1 1/2" C, 4 #1, 1 #8G	90/0	B	C	A	-	-	-	-	10
11	-	18100	-	-	A	B	C	-	-	-	-	12
13	-	15400	-	-	A	B	C	-	-	-	-	14
15	VAV-6,7,8	15400	1 1/4" C, 4 #1, 1 #10G	75/0	B	C	A	-	-	-	-	16
17	-	15400	-	-	A	B	C	-	-	-	-	18
19	-	15400	-	-	A	B	C	-	-	-	-	20
21	-	8400	-	-	A	B	C	-	-	-	-	22
23	-	8400	-	-	A	B	C	-	-	-	-	24
25	-	8400	-	-	A	B	C	-	-	-	-	26
27	XFRM LP	8400	1" C, 4 #6, 1 #10G	45/0	B	C	A	-	-	-	-	28
29	-	8400	-	-	A	B	C	-	-	-	-	30
31	-	18700	-	-	A	B	C	-	-	18700	-	32
33	-	18700	-	-	A	B	C	100/0	1 1/2" C, 4 #1, 1 #8G	18700	XFRM EL	34
35	-	18700	-	-	A	B	C	-	-	18700	-	36
37	-	18700	-	-	A	B	C	-	-	-	-	38
39	-	18700	-	-	A	B	C	-	-	-	-	40
41	-	18700	-	-	A	B	C	-	-	-	-	42
CONNECTED LOAD = 317610 VA PHASE A = 105870 VA PHASE B = 105870 VA PHASE C = 105870 VA												
CONNECTED LOAD = <b>392.65</b> AMPS												

**ELECTRICAL  
ROOF PLAN**

**E2.2**



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FBC Elections Administration Building

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FOR BID AND PERMIT

A B

KEY PLAN  
PLAN NORTH  
TRUE NORTH

Project No.:

Drawing Date: .  
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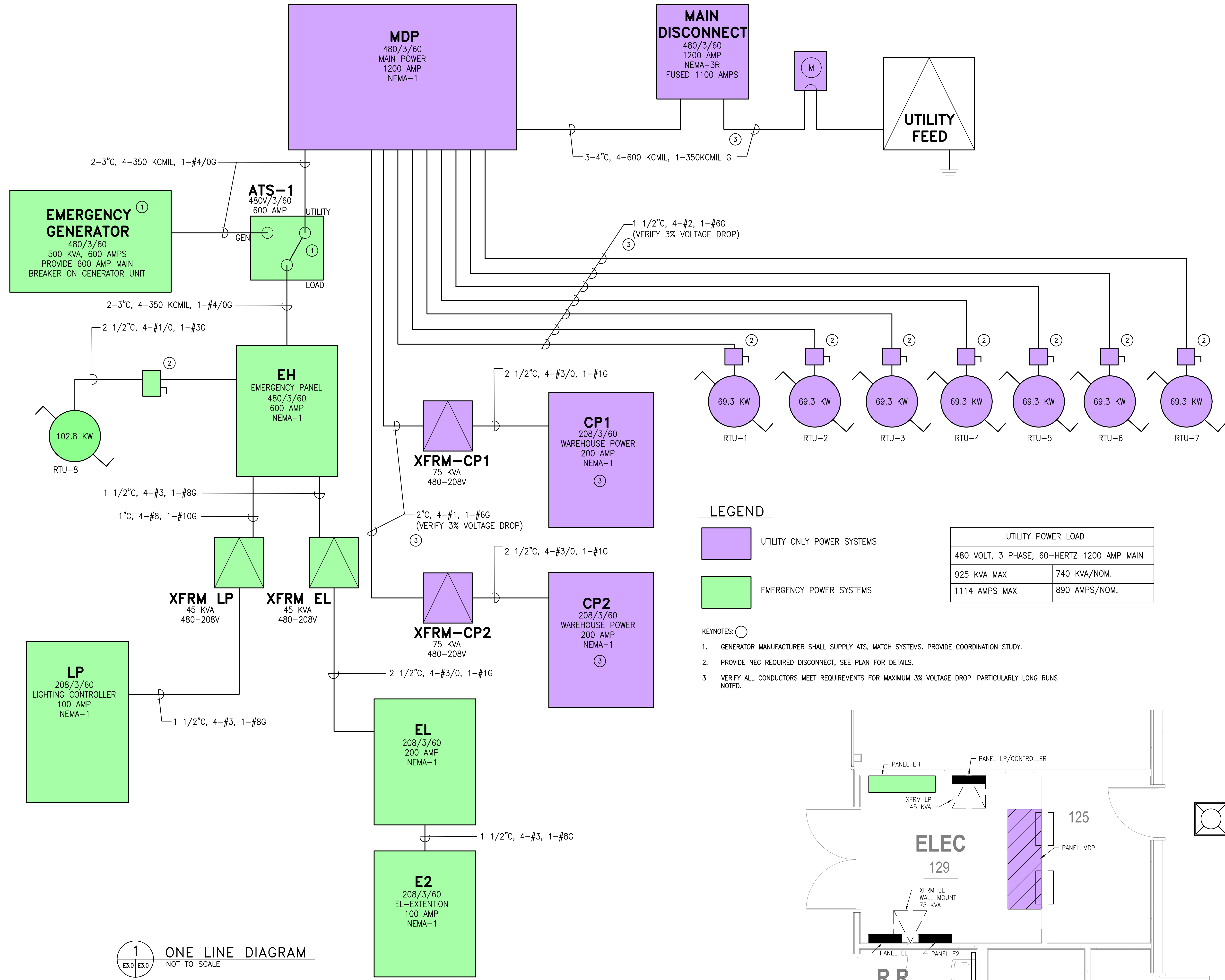
ELECTRICAL  
ONE LINE  
DIAGRAM

E3.0

GENERAL NOTES - ELECTRICAL:  
APPLY TO ALL ELECTRICAL DRAWINGS

- THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING THE WORK UNDER THIS SECTION OF THE CONTRACT IN FULL COMPLIANCE WITH NEC—MOST RECENT EDITION AND ALL APPLICABLE LOCAL, STATE, AND FEDERAL CODES. IF THE CONTRACTOR DETERMINES THAT THE CONTRACT DOCUMENTS AND PLANS ARE NOT IN COMPLIANCE WITH THE APPLICABLE LOCAL CODES, HE SHALL INFORM THE ARCHITECT/ENGINEER FOR DIRECTION PRIOR TO BIDDING THE JOB. FAILURE TO DO SO SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO MEET APPLICABLE LOCAL CODES AT HIS COST.
- THE ELECTRICAL DISTRIBUTION SYSTEM SIZING IS BASED ON EQUIPMENT DATA FROM THE SPECIFIED SUPPLIER OR A TYPICAL SUPPLIER. THE CONTRACTOR IS FULLY RESPONSIBLE FOR PROVIDING THE CORRECTLY SIZED ELECTRICAL SYSTEM TO MATCH THE REQUIREMENTS OF THE ELECTRICALLY POWERED EQUIPMENT ACTUALLY INSTALLED. USE NEC MINIMUM CONDUIT AND CONDUCTOR SIZE WHERE NOT INDICATED. FIELD VERIFY POWER REQUIREMENT FROM NAMEPLATE DATA.
- THE BIDDER SHALL VISIT THE SITE OF THE PROPOSED WORK AND SHALL FULLY INFORM HIMSELF REGARDING THE FACILITIES. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR WORK OR MATERIAL OMITTED FROM BIDDER'S CONTRACT PROPOSAL DUE TO HIS FAILURE TO SO INFORM HIMSELF BY SUCH INVESTIGATION.
- CONTRACTOR SHALL COORDINATE ALL WORK WITH ARCHITECTURAL DRAWINGS, OTHER TRADES, AND VERIFY LOCATION OF ALL EQUIPMENT WITH OWNER OR ARCHITECT BEFORE CONSTRUCTION. FAILURE TO DO SO MIGHT RESULT IN MOVING EQUIPMENT AT NO COST TO OWNER.
- CONTRACTOR SHALL BE RESPONSIBLE TO REPAIR OR REPLACE, TO THE SATISFACTION OF THE OWNER, ARCHITECT, AND ENGINEER, ANY UTILITIES, MATERIALS, EQUIPMENT, WALLS, FOUNDATIONS, ETC. DAMAGED, DISASSEMBLED, REMOVED OR AFFECTED BY CONSTRUCTION, EXCAVATION, INSTALLATION, REMOVAL, OR ACCIDENT.
- ALL CONDUCTORS SHALL BE COPPER, ROUTED IN CONDUIT WITH SPLICES IN APPROVED ACCESSIBLE JUNCTION BOXES. INSULATION SHALL BE AS THIN, THIN UNLESS OTHERWISE NOTED.
- BRANCH CIRCUITS SHALL BE #12 MINIMUM WITH 1P/20A INVERSE TIME CIRCUIT BREAKERS (REFER TO #2 ABOVE). TWENTY-AMP CIRCUIT RUNS EXCEEDING 100 FEET SHALL BE WITH MINIMUM #10 COPPER CONDUCTORS.
- CONTRACTOR SHALL SIZE CONDUCTORS AS REQUIRED TO MAINTAIN A MAXIMUM VOLTAGE DROP OF 3 PERCENT FROM SERVICE TO DEVICE.
- CONTRACTOR SHALL PROVIDE CIRCUIT CONTINUITY OF ALL BRANCH CIRCUITS AND ACCESSIBLE JUNCTION BOXES WITH SPLICES SO THAT ANY RECEPTACLE, LIGHT, OR DEVICE MAY BE REMOVED WITHOUT INTERRUPTION OF CIRCUIT CONTINUITY.
- ALL INTERIOR CONDUIT SHALL BE NEC MINIMUM SIZE EMT COMPRESSION FITTINGS EMT, ROUTED PARALLEL OR PERPENDICULAR TO WALLS, NEAR CEILINGS (IF EXPOSED OVERHEAD), WITH PULL BOXES AND EXPANSION UNIONS AS REQUIRED UNLESS OTHERWISE NOTED.
- ALL EXTERIOR EXPOSED CONDUIT SHALL BE NEC MINIMUM SIZE RGS UNLESS OTHERWISE NOTED.
- ALL CONDUIT DIRECT BURIED, UNDER SLAB, OR IN DUCT BANK SHALL BE PVC SCHEDULE 40, SUITABLE FOR ITS INTENDED USE, NEC MINIMUM SIZE AND 24 INCHES MINIMUM BURIAL DEPTH UNLESS OTHERWISE NOTED. STUB-UP (PVC) ELBOWS LARGER THAN 1-INCH SHALL BE SCHEDULE 80, WITH CONCRETE EMBEZZMENT FOR PULLING STRENGTH. ALL STUB-UPS SHALL BE RGS UP TO 8 FEET ABOVE FINISHED FLOOR. (INSTALLATION IN CONCRETE SHALL HAVE MINIMUM 3-INCH COVERING, ALL OTHER INSTALLATIONS SHALL HAVE 24 INCHES MINIMUM OF SAND.)
- CONTRACTOR SHALL LOCATE ALL EXISTING UNDERGROUND UTILITIES AND EQUIPMENT PRIOR TO ANY EXCAVATIONS.
- NO CONDUIT SHALL BE ROUTED EXPOSED ON HORIZONTAL SURFACES SO AS TO CREATE A TRIPPING HAZARD.
- ALL STRUCTURE PENETRATIONS SHALL BE SEALED IN SUCH A MANNER AS TO EQUAL OR EXCEED THE ORIGINAL STRUCTURE CHARACTERISTICS, INCLUDING FIRE RATINGS, WEATHERPROOFING, ETC. PROVIDE METALIC CONDUIT AND INTUMESCENT PUTTY SEAL ON ALL FIRE BARRIER PENETRATIONS.
- ALL ELECTRICAL EQUIPMENT USED FOR THIS PROJECT SHALL BE U.L. APPROVED, COMMERCIAL GRADE, AND SUITABLE FOR ITS INTENDED PURPOSE.
- MOUNTING OF ALL DEVICES SHALL BE AS FOLLOWS UNLESS OTHERWISE NOTED. CENTERLINE OF DEVICES SHALL BE:
 

UTILITY POWER LOAD	
RECEPTACLES 18" AFF	740 KVA/NOM.
TOGGLE SWITCHES 48" AFF	890 AMPS/NOM.
PANEL BOARDS 60" AFF	
SAFETY SWITCHES 60" AFF	
- ALL EQUIPMENT SHALL BEAR A PERMANENT LABEL FOR IDENTIFICATION. DISCONNECTS AND DEVICES FOR EQUIPMENT SHALL BE LOCKABLE AND PANELS SHALL BE WITH LOCK AND KEY.
- ALL BRANCH AND FEEDER CIRCUITS SHALL BE LABELED AT THEIR RESPECTIVE OVERCURRENT PROTECTIVE DEVICE WITH AN ADEQUATE DESCRIPTION OF PURPOSE AND LOCATION.
- ALL PANELBOARDS SHALL BE SQUARE D, G.E. OR CUTLER-HAMMER WITH BOLT-ON CIRCUIT BREAKERS, NEUTRAL BUS AND GROUND BUS.
- ALL SURFACE MOUNT (EXPOSED) BOXES SHALL BE FD TYPE.
- PROVIDE DISCONNECTING MEANS WITHIN SIGHT OF EQUIPMENT AS REQUIRED BY ARTICLE 430, LATEST EDITION OF NEC. PROVIDE ONE DISCONNECT TO EACH EQUIPMENT UNIT.
- INSTALLATION FOR SPECIAL EQUIPMENT SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTION.
- CONTRACTOR SHALL BALANCE ALL LOADS ON THE ELECTRICAL SYSTEM.
- CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS, PAY ALL LEGAL FEES AND CHARGES PERTAINING TO WORK UNDER THIS PROJECT.
- CONTRACTOR SHALL PROVIDE EQUIPMENT SUITABLE FOR ISOLATED GROUND INSTALLATIONS; ISOLATED GROUND CIRCUIT CONDUCTOR, ISOLATED GROUND BUS BAR IN PANEL, ISOLATED GROUNDING ELECTRODE CONDUCTOR, CONNECTORS, CONDUIT, AND ALL ASSOCIATED EQUIPMENT WHEN ANY DEVICE IS DESIGNATED ISOLATED GROUND (IG). ISOLATED GROUND CIRCUIT CONDUCTOR SHALL BE GREEN COLOR AND EQUAL IN SIZE AND INSULATION TO CIRCUIT CONDUCTORS. ISOLATED GROUND ELECTRODE CONDUCTOR SHALL BE SIZED ACCORDING TO QUANTITY AND SIZE OF ISOLATED GROUND CIRCUITS CONNECTED.
- ALL TELEPHONE, COMMUNICATION, COMPUTER, FAX, MODEM, OR OTHER NON-POWER OUTLETS SHALL BE A RECEPTACLE BOX MOUNTED 18 INCHES AFF AND 3/4-INCH EMT CONDUIT WITH PULL WIRE STUBBED-UP 4 INCHES ABOVE CEILING IN AN ACCESSIBLE LOCATION UNLESS OTHERWISE NOTED.
- ALL CONDUITS INSTALLED BY CONTRACTOR FOR USE BY OTHERS OR WITH NO CONDUCTORS SHALL CONTAIN PULL WIRES.
- PROVIDE 120V, 1pH, 60HZ POWER TO ALL HVAC DEVICES TO SUPPORT DDC PANELS, SMOKE DAMPERS, SUPPLY FAN DAMPERS AND VALVE ACTUATORS, INCLUDING CONDUIT CONDUCTOR, DISCONNECT DEVICE, FLEXIBLE CONNECTORS AND ALL TERMINATIONS. PROVIDE POWER TO LOW VOLTAGE TRANSFORMERS.
- VERIFY THE LOCATION OF ALL WALLS, PARTITIONS, DOORS, CABINETS, AND CEILINGS FROM ACTUAL FIELD MEASUREMENTS.
- ELECTRICAL SHALL PROVIDE SMOKE DETECTOR AND SHUTDOWN CONTROLS ON ALL AIR HANDLERS AND SUPPLY FANS. MECHANICAL WILL MOUNT DETECTORS.
- PROVIDE FIRE ALARMS, BOTH AUDIO AND VISUAL INCLUDING DETECTION SYSTEMS, TO MEET THE REQUIREMENTS OF TEXAS DEPARTMENT OF LICENSING AND REGULATIONS. ALL DEVICES SHALL BE MOUNTED PER LATEST EDITION OF NEC (NFPA).



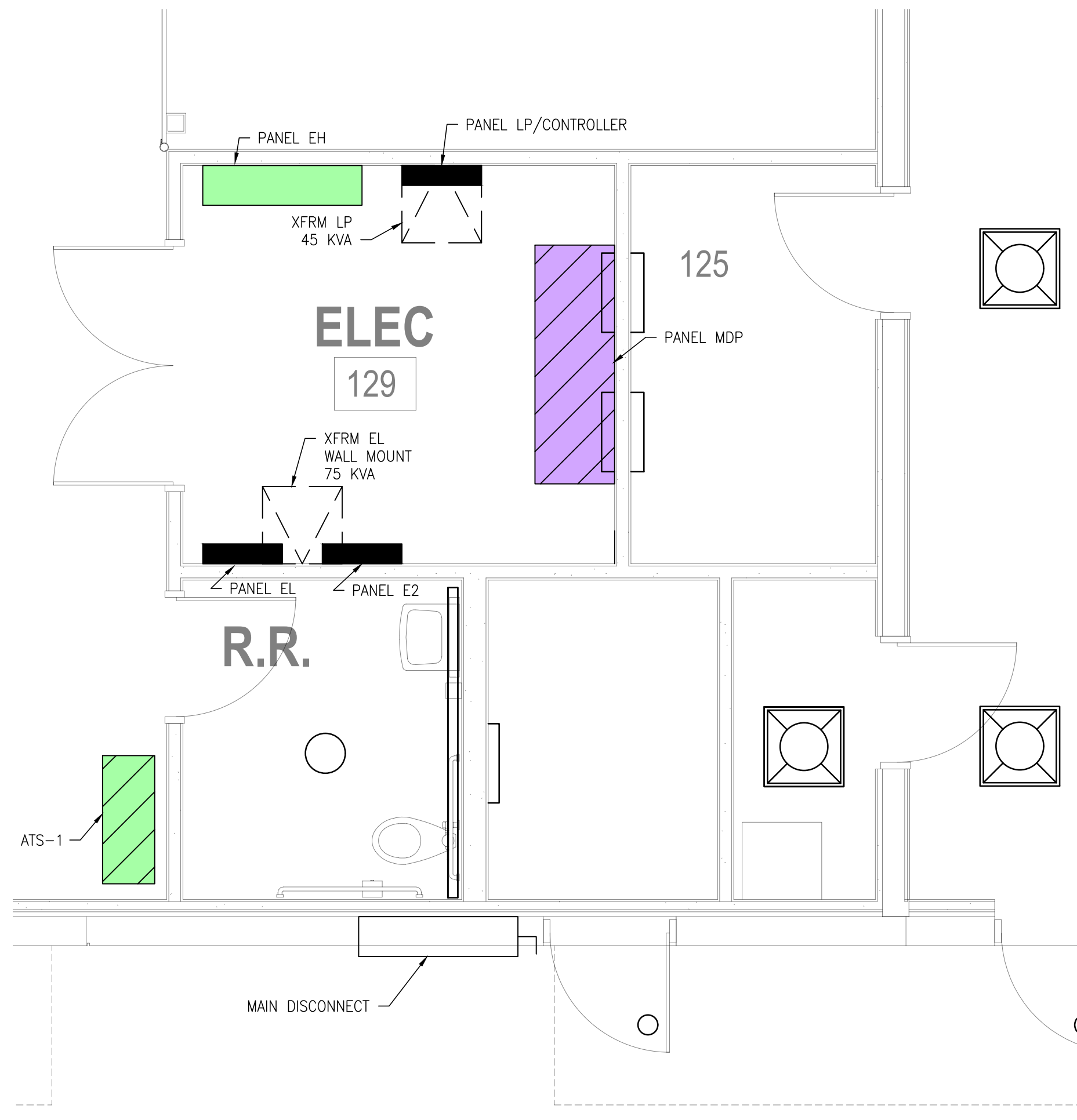
LEGEND

- UTILITY ONLY POWER SYSTEMS
- EMERGENCY POWER SYSTEMS

UTILITY POWER LOAD	
480 VOLT, 3 PHASE, 60-HERTZ 1200 AMP MAIN	
925 KVA MAX	740 KVA/NOM.
1114 AMPS MAX	890 AMPS/NOM.

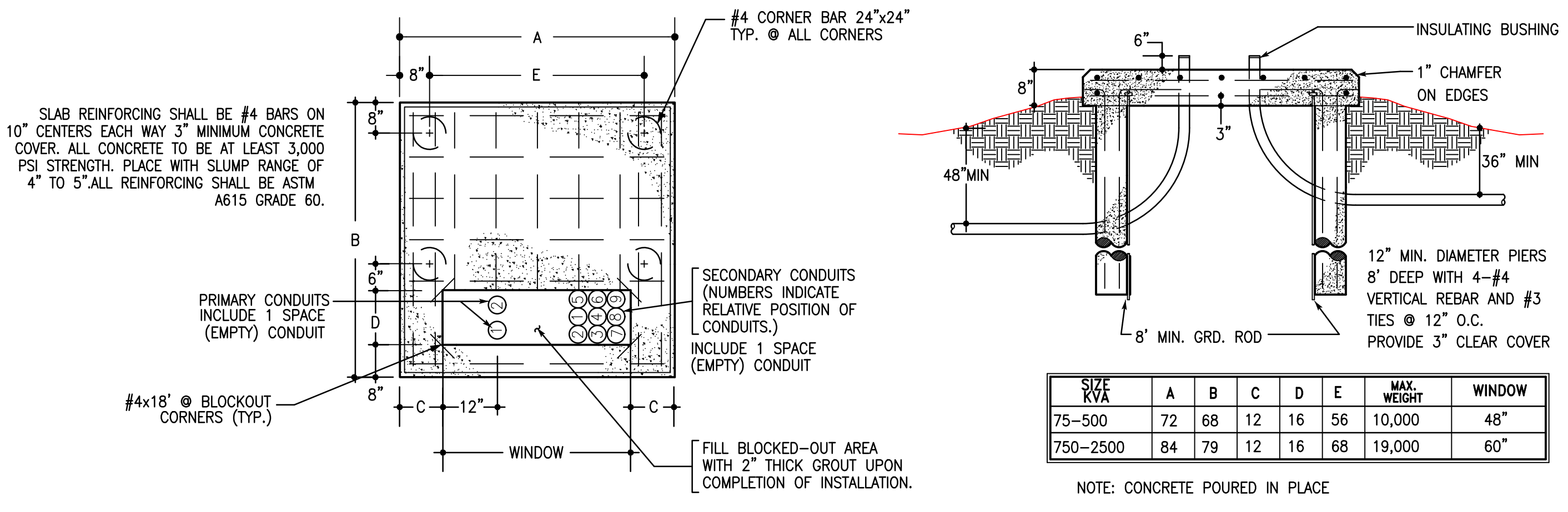
KEYNOTES:

- GENERATOR MANUFACTURER SHALL SUPPLY ATS, MATCH SYSTEMS. PROVIDE COORDINATION STUDY.
- PROVIDE NEC REQUIRED DISCONNECT, SEE PLAN FOR DETAILS.
- VERIFY ALL CONDUCTORS MEET REQUIREMENTS FOR MAXIMUM 3% VOLTAGE DROP, PARTICULARLY LONG RUNS NOTED.



2 ELECTRICAL ROOM  
SCALE: 3/8" = 1'-0"

1 ONE LINE DIAGRAM  
E3.0 E3.0 NOT TO SCALE

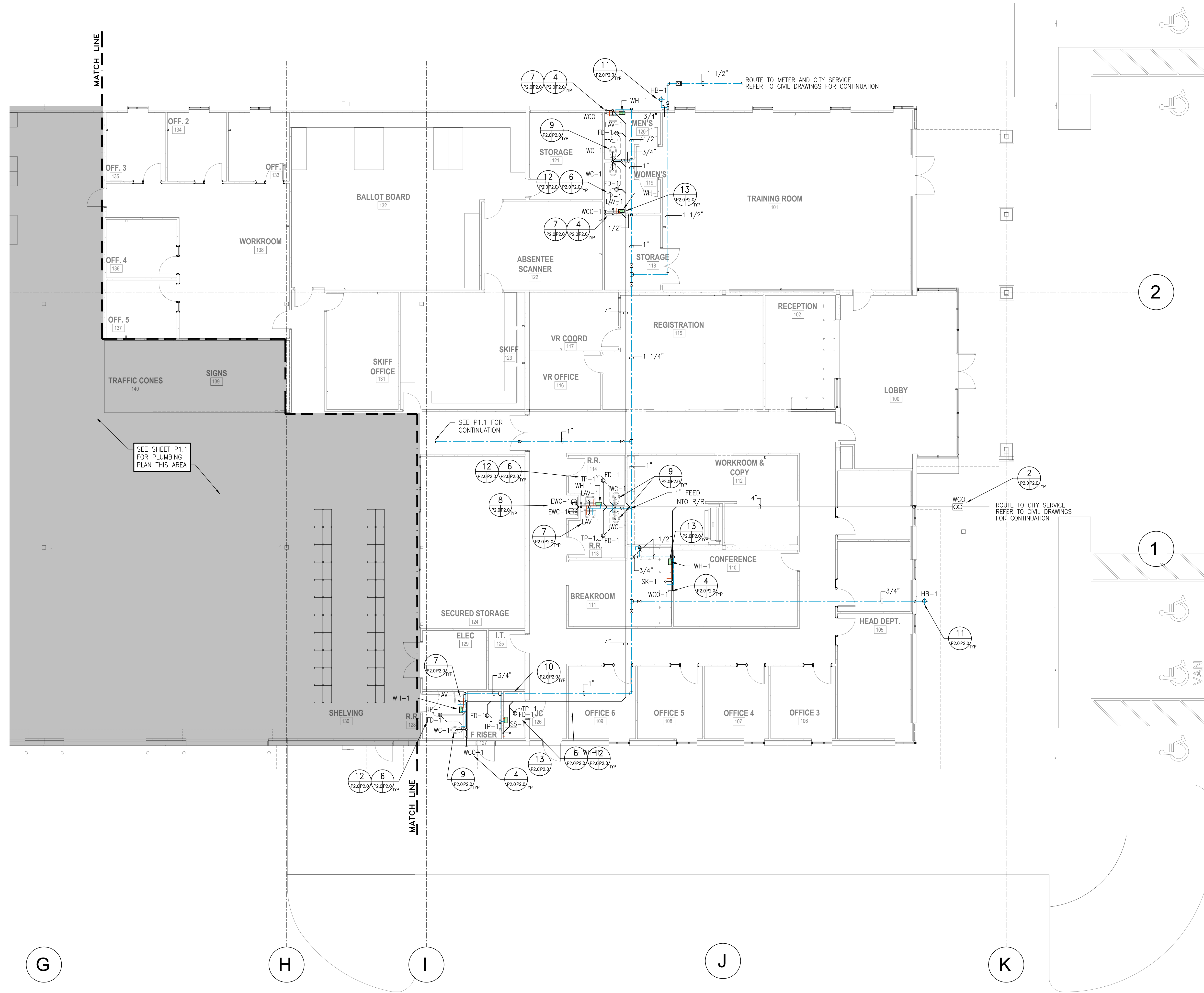


3 TRANSFORMER PAD DETAIL  
E3.0 E3.0 NOT TO SCALE

THIS DRAWING IS PROVIDED FOR ESTIMATING PURPOSES ONLY. ALL DIMENSIONS MUST BE CERTIFIED BY UTILITY DISTRICT ENGINEER BEFORE ERECTION.

**GENERAL NOTES - PLUMBING:**

- THESE NOTES COVER ALL PLUMBING WORK REQUIRED BY THE PROJECT AND ILLUSTRATED ON THE PLUMBING DRAWINGS.
- CONTRACTOR SHALL COORDINATE WORK WITH OTHER TRADES AND WORK WITH THEM IN VERIFYING INSTALLATION LOCATIONS FOR ALL PLUMBING FIXTURES, TRIM, DRAIN LINES, VENT LINES AND WATER LINES. CONTRACTOR SHALL MAKE HIMSELF KNOWLEDGEABLE OF THE SCOPE OF THE ENTIRE PROJECT AND WITH ALL MECHANICAL HVAC AND ELECTRICAL WORK.
- ALL OPENINGS CUT IN MASONRY AND PLASTER WALLS, OR CONCRETE FLOORS SHALL BE CORE DRILLED OR SAWED WHEN POSSIBLE. CONTRACTOR SHALL CHECK BUILDING CONSTRUCTION BEFORE MAKING PENETRATIONS TO AVOID CUTTING THROUGH STRUCTURAL BEAMS AND REINFORCING. CONTRACTOR SHALL INFORM THE ENGINEER IF REINFORCING IS CUT OR DAMAGED WHILE MAKING OPENINGS. CONTRACTOR SHALL REINFORCE ALL OPENINGS AS REQUIRED BY DRAWINGS AND SPECIFICATIONS. PATCH AND SEAL OPENINGS WITH 8000 PSI SAND CEMENT GROUT. INSTALL DECORATIVE TRIM (EQUIPMENT FLANGES, FRAMING OR ESCUTCHEONS) AROUND OPENINGS IN FINISHED AREAS. COORDINATE ALL CUTTING AND PATCHING WITH THE OTHER TRADES.
- ON ANY WORK SHOWN ON PLUMBING DRAWINGS WHICH REQUIRES DEMOLITION OF NEW BUILDING STRUCTURES AND PAVING, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLETE THE NECESSARY DEMOLITION. CONTRACTOR SHALL PATCH AND REPAIR ALL DEMOLITION WORK. PATCHING SHALL BE COMPLETED WITH THE SAME MATERIALS AS THE SURROUNDING AREAS, OR WITH ARCHITECT-APPROVED PATCHING MATERIALS. REPAIRS SHALL BE COMPLETED AS PER ARCHITECTURAL SPECIFICATIONS. ALL REFINISHING SHALL MATCH SURROUNDING FINISHES. COLOR SELECTION SHALL BE APPROVED BY THE ARCHITECT.
- ALL PLUMBING WORK SHALL BE COMPLETED IN STRICT COMPLIANCE WITH THE INTERNATIONAL PLUMBING CODE REQUIREMENTS AND LOCAL CODES. CONTRACTOR SHALL COORDINATE FINAL TIE INS, PLUMBING LINES AND FIXTURES SHALL BE IN ACCORDANCE WITH LOCAL CODES, STATE AND FEDERAL HANDICAPPED CODES AND REQUIREMENTS.
- CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL PARTITIONS, WALLS, FIXTURES, ETC., WITH DIMENSIONED ARCHITECTURAL PLANS AND SITE SURVEYS, DRAWINGS AND RISERS ARE SCHEMATIC AND EXACT DIMENSIONS SHALL BE VERIFIED IN ALL CASES.
- COORDINATE THE FINAL LOCATION ON ALL FLOOR CLEANOUTS (C.O.), HUB DRAINS (H.D.), AND FLOOR DRAINS (F.D.) TO FIT INTO STRUCTURES. LOCATE ALL CLEANOUTS SO AS NOT TO OBSTRUCT ARCHITECTURAL BUILD OUT. PROVIDE TRAP PRIMERS ON ALL HUB AND FLOOR DRAINS.
- COORDINATE ALL EQUIPMENT CONNECTION SIZES TO MATCH THOSE INDICATED OR REQUIRED BY THE FIXTURE MANUFACTURE, WHICH EVER IS LARGEST. CONVERT PVC LINES TO COPPER ON ALL DW LINES WHICH PENETRATE FIRE BARRIERS. CONVERT LINES FROM CAST IRON TO PVC AS NECESSARY TO TIE INTO UTILITY LINES. ALL DW LINES UNDER BUILDINGS OR PAVING SHALL BE PVC, CAST IRON, OR COPPER. PROVIDE FIRE BARRIER MATERIAL AT ALL FIRE BARRIER PENETRATIONS.
- VERIFY THE DEPTH AND DIRECTION OF FLOW OF THE SANITARY SEWER OUTLET BEFORE ORDERING PARTS OR STARTING WORK ON THE PROJECT. VERIFY THAT ALL NEW LINE INVERTS ARE OBTAINABLE BEFORE STARTING ANY FABRICATION.
- ALL MAIN WATER PIPING SHALL BE LOCATED IN THE ATTIC SPACE, WALLS AND PLUMBING CHASES. ALL PRIMARY SANITARY SEWER AND CONDENSATE LINES SHALL BE LOCATED IN PLUMBING CHASES OR BELOW FLOOR. MAIN BUILDING WATER TIE INS SHALL INCLUDE VALVE, VALVE BOX AND BUILDING DRAIN. WATER LINES RUN BELOW THE SLAB SHALL BE SEAMLESS ANNEALED COPPER. NO FITTINGS SHALL BE ALLOWED BELOW GRADE.
- ALL REQUIRED UTILITIES CONNECTION FEES, TAPS, VALVES, METERS AND OTHER SERVICE CONNECTION DEVICES OR REQUIREMENTS NECESSARY TO COMPLETE THE PLUMBING SYSTEM AND TIE INTO CITY UTILITIES SHALL BE INCLUDED HEREIN.
- ALL FIXTURES AND DEVICES SHOWN AND REQUIRED SHALL BE INCLUDED IN THE CONSTRUCTION. FIXTURES NOT INDICATED ON THE DRAWINGS SHALL BE SELECTED AS APPROPRIATE FOR THE INSTALLATION USING THE PLUMBING FIXTURE SCHEDULE (I.E.: CLEANOUTS, DRAINS, ETC.). ANY DEVIATION FROM THE SCHEDULED FIXTURES, PIPE ROUTING, OR OTHER SYSTEM COMPONENTS OR FUNCTIONS SHALL BE APPROVED BY THE ENGINEER. ALL WALL HUNG FIXTURES SHALL BE WITH FLOOR MOUNTED CHAIR CARRIER.
- ADJUST ALL FIXTURE MOUNTINGS AND ROUGHING DIMENSIONS AS NECESSARY. VERIFY ROUGH-INS BEFORE PURCHASING EQUIPMENT AND FIXTURES. PROVIDE NEW WAX RINGS, AND CLAMPS AT ALL NEW WATER CLOSETS. PROVIDE CHAIR CARRIERS, DRAIN CONNECTIONS, AND WATER PIPING AT ALL FIXTURES. ALL CHAIR CARRIERS SHALL BE CONCEALED TYPE WITH FLOOR MOUNTED, BOLT DOWN SUPPORTS.
- PROVIDE THE SERVICE SINK WITH EITHER A WALL- OR FLOOR-MOUNTED MANUFACTURER-SUPPLIED P TRAP. VERIFY THE CORRECT DIMENSIONAL AND POSITION REQUIREMENTS IN THE FIELD AND PROVIDE THE PROPER UNIT.
- COORDINATE THE POSITION, CLEARANCES AND MOUNTING HEIGHTS OF ALL FIXTURES INCLUDING HANDICAPPED UNITS. REFER ANY DISCREPANCIES ON MOUNTINGS TO THE ARCHITECT FOR VERIFICATION BEFORE COMPLETING CONSTRUCTION WORK.
- VERIFY POSITION AND DEPTH OF FAUCETS AND SINK BOWLS ON ALL HANDICAPPED SINK FIXTURES BEFORE ORDERING PARTS.
- VERIFY BEAM PENETRATION REQUIREMENTS AND COORDINATE WITH THE ENGINEER TO DETERMINE PROPER REINFORCING REQUIREMENT. AVOID BORING THROUGH BEAMS AND STRUCTURAL MEMBERS.
- CONTRACTOR SHALL SUPPLY AND INSTALL ALL PLUMBING PIPING SHOWN AND REQUIRED TO COMPLETE THE SYSTEM ILLUSTRATED IN THIS DRAWING PACKAGE. ALL TRENCH WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE PIPE TRENCH DETAIL SHOWN. ALL UNDERGROUND PIPING SHALL BE AS SPECIFIED FOR EXTERIOR LINES OR AS A CONTINUATION OF INTERIOR SYSTEMS AND MATERIALS. ALL PIPE AND FITTINGS SHALL BE PROTECTED WITH MANUFACTURER'S APPROVED CORROSION PROTECTION SYSTEMS.
- CONTRACTOR SHALL MAKE ALLOWANCE FOR THERMAL EXPANSION USING A TEMPERATURE CHANGE OF 60 DEGREES F. OR AS APPROPRIATE.
- CONTRACTOR SHALL INSTALL UNDERGROUND PIPING IN A CLEAN EXCAVATED TRENCH AND COMPACT THE BEDDING AGAINST VIRGIN SOILS. COMPACT ALL BACKFILL TO 95 PERCENT OF STANDARD PROCTOR.
- ALL BACKFILL MATERIALS, THEIR HAULAGE, AND THE REMOVAL AND DISPOSAL OF EXCAVATED MATERIAL ARE THE RESPONSIBILITY OF THE CONTRACTOR.
- CONTRACTOR SHALL NOT COVER UP ANY PART OF THE PIPE LINES BEFORE THEY ARE BOTH VISUALLY INSPECTED BY THE ENGINEER AND OWNER AND WITNESSED HYDROTEST HAS BEEN COMPLETED AND APPROVED.
- ALL GAS PIPING LOCATED IN BUILDINGS SHALL BE INSTALLED IN A VENTED SPACE OR ENCASED IN A DIRECTLY VENTED CAST IRON PIPE. NO GAS PIPING SHALL BE INSTALLED IN A CONFINED SPACE OR BELOW ANY BUILDINGS.
- ALL GAS PIPING INSTALLATIONS SHALL MEET THE REQUIREMENTS OF NFPA-54. ALL GAS LINES SERVING EQUIPMENT SHALL HAVE A GAS COCK AT EACH UNIT CONNECTION ALONG WITH A DIRT LEG AND SCREEN DEVICE.
- ROOF-MOUNTED GAS PIPING SHALL CONTAIN A SWING JOINT AT ALL VERTICAL RISERS AND EXPANSION LOOPS TO OFFSET A 100 DEGREE F. TEMPERATURE CHANGE. ALL ROOF MOUNTED PIPE SHALL BE SUPPORTED ON ROLLER OR SLIDE BLOCK SUPPORTS.
- PROVIDE A GAS MAIN SHUT OFF VALVE TO EACH DISTINCT AREA OF A FACILITY, PRIMARY ENTRANCE, EACH FLOOR, EACH WING, ETC.
- VERIFY THAT GAS LINE SIZING AND LINE PRESSURES MATCH THE INSTALLED EQUIPMENT BEFORE FABRICATION OF THE GAS SYSTEM.
- PROVIDE CATHODIC PROTECTION ON ALL BURIED METAL GAS PIPE.
- FIRE PROTECTION SHALL BE DESIGNED, INSTALLED, TESTED, AND DOCUMENTED IN ACCORDANCE WITH NFPA 13 AND THE CITY FIRE DEPARTMENT CODES AND REGULATIONS. CONTRACTOR SHALL PROVIDE DESIGN TO THE FIRE DEPARTMENT, AND SHALL OBTAIN APPROVAL, BEFORE BEGINNING CONSTRUCTION.
- SYSTEM SHALL BE DESIGNED TO PROTECT THE ENTIRE BUILDING AS SHOWN IN PLUMBING DRAWINGS. LAYOUT OF SYSTEM AS SHOWN IS SCHEMATIC ONLY AND IS INTENDED TO IDENTIFY GENERAL LOCATIONS OF PIPING. CONTRACTOR SHALL THOROUGHLY REVIEW SPRINKLER SYSTEM REQUIREMENTS BEFORE BIDDING JOB AND DETERMINE ALL ASPECTS OF CONSTRUCTION NECESSARY TO PROVIDE A CERTIFIABLE SYSTEM.
- UPON FINAL INSPECTION AND TEST BY THE FIRE DEPARTMENT, IF CHANGES ARE REQUIRED AS A RESULT OF NON-APPROVED INSTALLATION, CONTRACTOR SHALL CORRECT SUCH DEFECTS AND RE TEST AT NO COST TO OWNER.
- FIRE PROTECTION CONTRACTOR AND FIRE ALARM CONTRACTOR SHALL COORDINATE ON INTERFACES AND PROVIDE CERTIFIED SYSTEM TO OWNER.
- LOCATION OF SPRINKLER HEADS: HEADS SHALL BE LOCATED AS REQUIRED BY CODE IN ALL ACCESSIBLE AND INACCESSIBLE SPACES, INCLUDING ATTICS. SPRINKLER HEAD SPACING SHALL BE AS REQUIRED BY NFPA 13 AND CAPABILITIES OF THE EQUIPMENT TO BE INSTALLED.
- ALL GRAVITY DRAINAGE PIPING, INCLUDING CONDENSATE AND SANITARY SEWER SHALL BE SLOPED PER CODE, BUT NOT LESS THAN 1/8" PER FOOT AWAY FROM THE SOURCE.



**1 PLUMBING PLAN - ADMINISTRATION**  
SCALE: 1/8" = 1'-0"

PLUMBING FIXTURE BRANCH SIZES				
DESCRIPTION	SOIL OR WASTE	VENT	COLD WATER	HOT WATER
WATER CLOSET	4"	* 2", 3", 4"	3/4"	-
URNAL	2"	1 1/2"	3/4"	-
LAVATORY	2"	* 1 1/4"	1/2"	1/2"
SINK	2"	1 1/2"	1/2"	1/2"
MOP BASIN	3"	2"	3/4"	3/4"
ELECTRIC WATER COOLER	2"	1 1/4"	1/2"	-
FLOOR DRAIN	3"	2"	1/2" TRAP PRIMER	-

\* SEE SCHEMATIC PIPING



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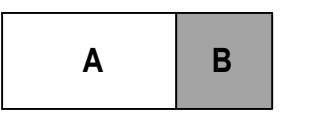
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**KEY PLAN**  
PLAN NORTH  
TRUE NORTH

Project No.:

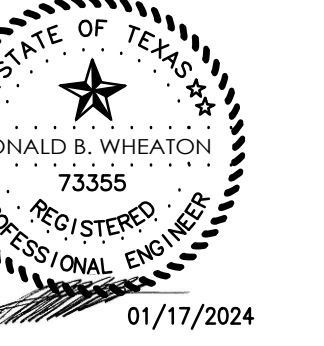
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No.	Description	Date

Revisions:		
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**PLUMBING PLAN ADMINISTRATION P1.0**



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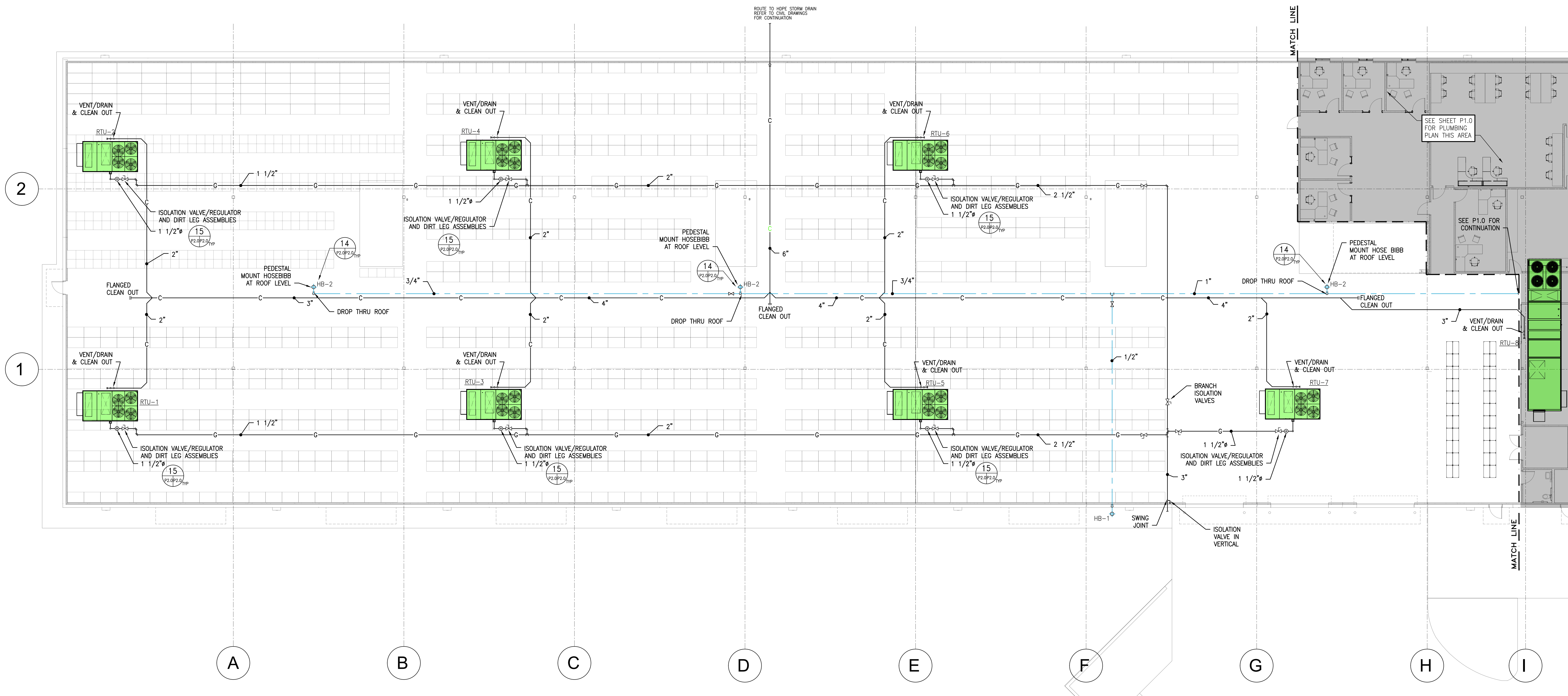
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**1** PLUMBING PLAN - WAREHOUSE  
SCALE: 3/32" = 1'-0"



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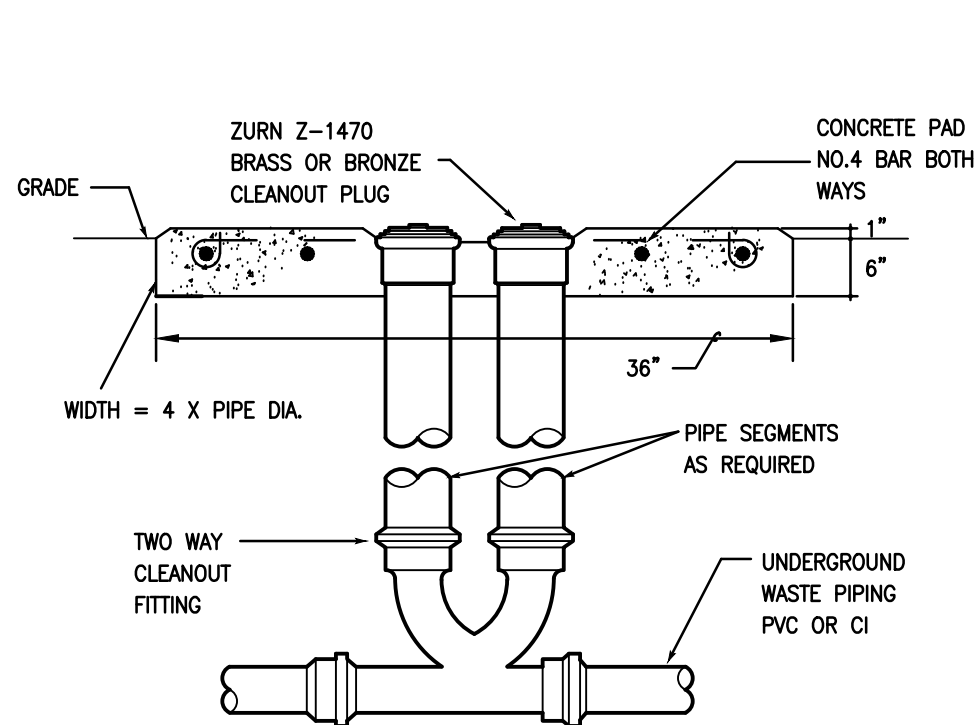
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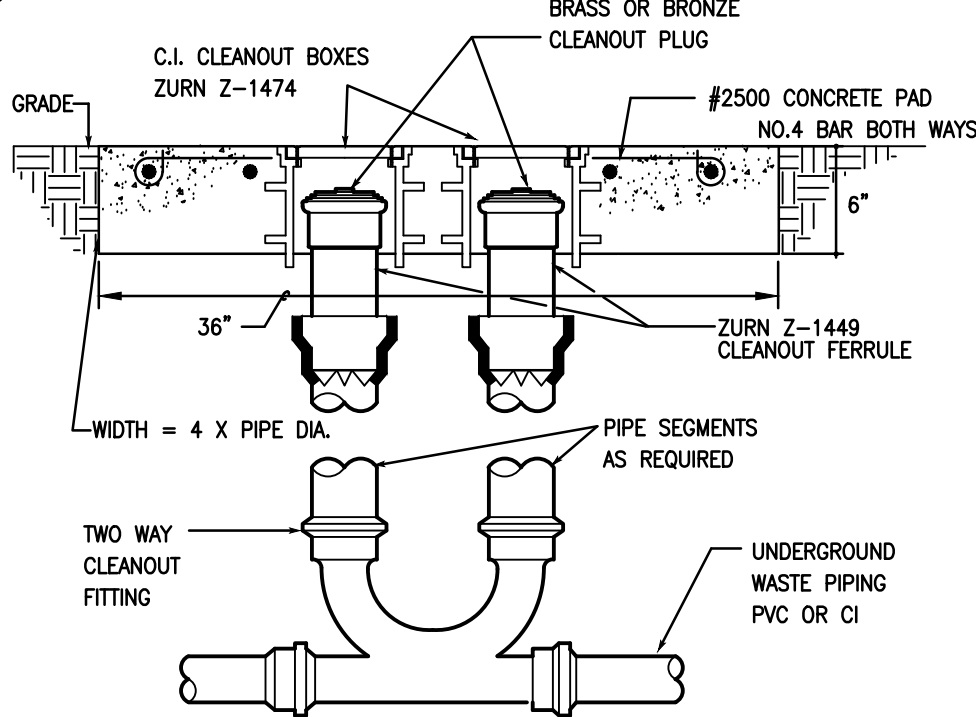
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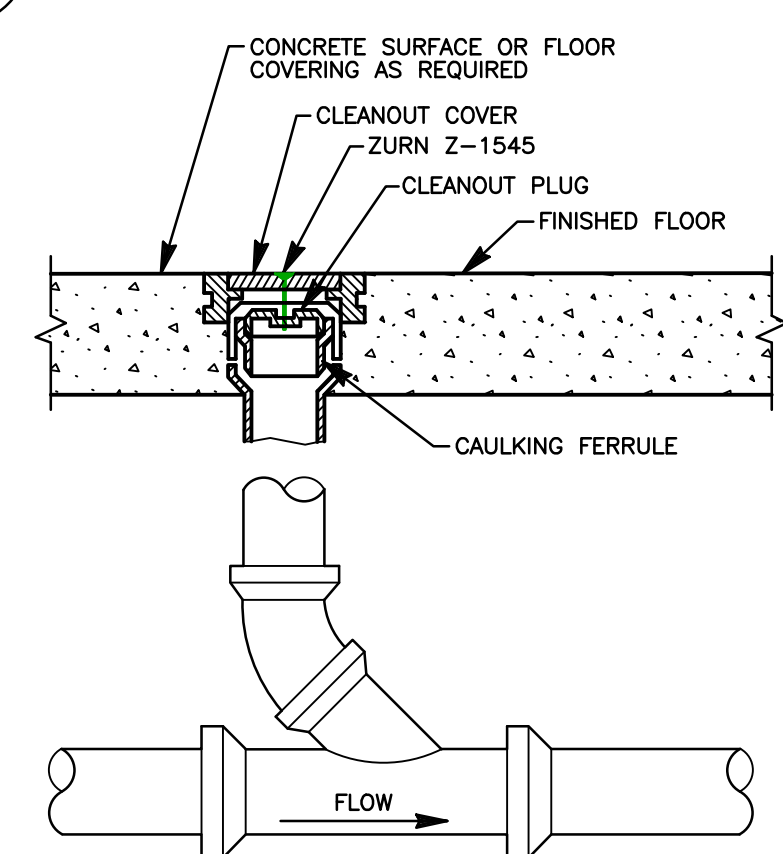
**PLUMBING PLAN WAREHOUSE P1.1**



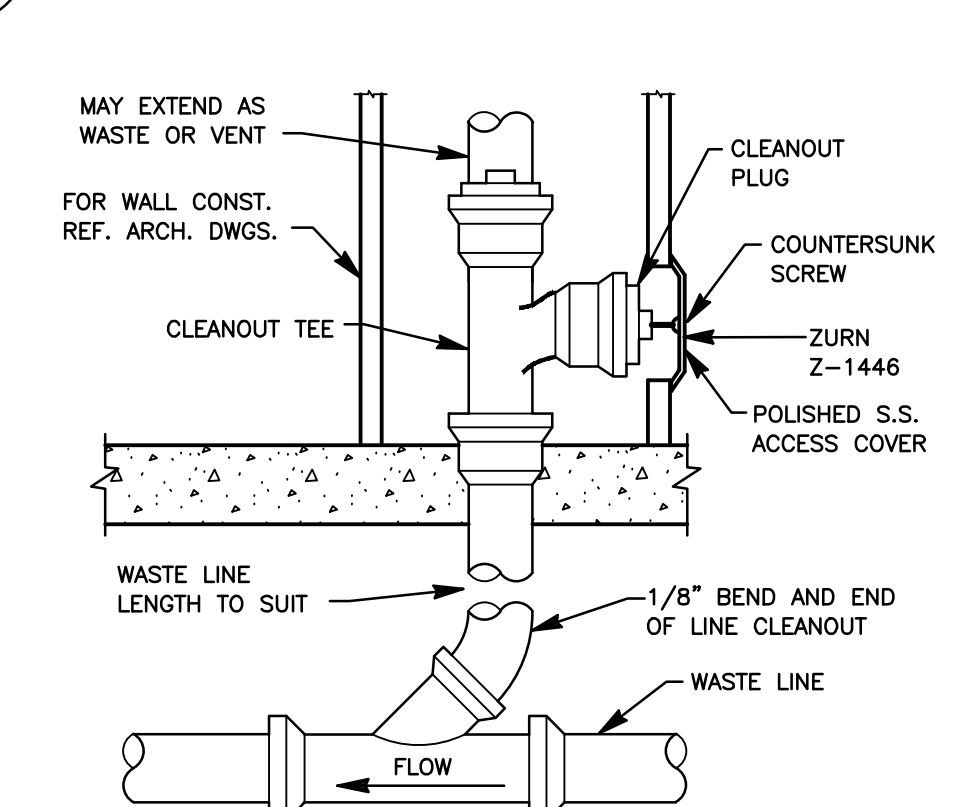
**1** TYPICAL TWIN EXTERIOR CLEANOUT  
P2.0 P2.0 NOT TO SCALE



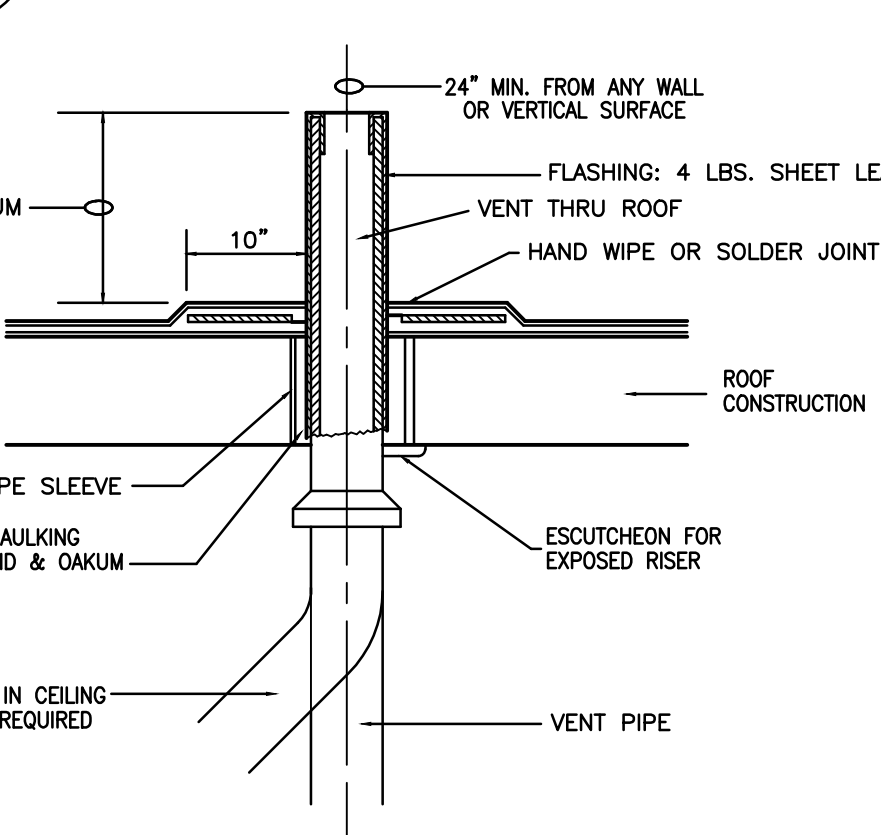
**2** TYPICAL TWIN EXTERIOR CLEANOUT (FINISHED & PAVED AREAS)  
P2.0 P2.0 NOT TO SCALE



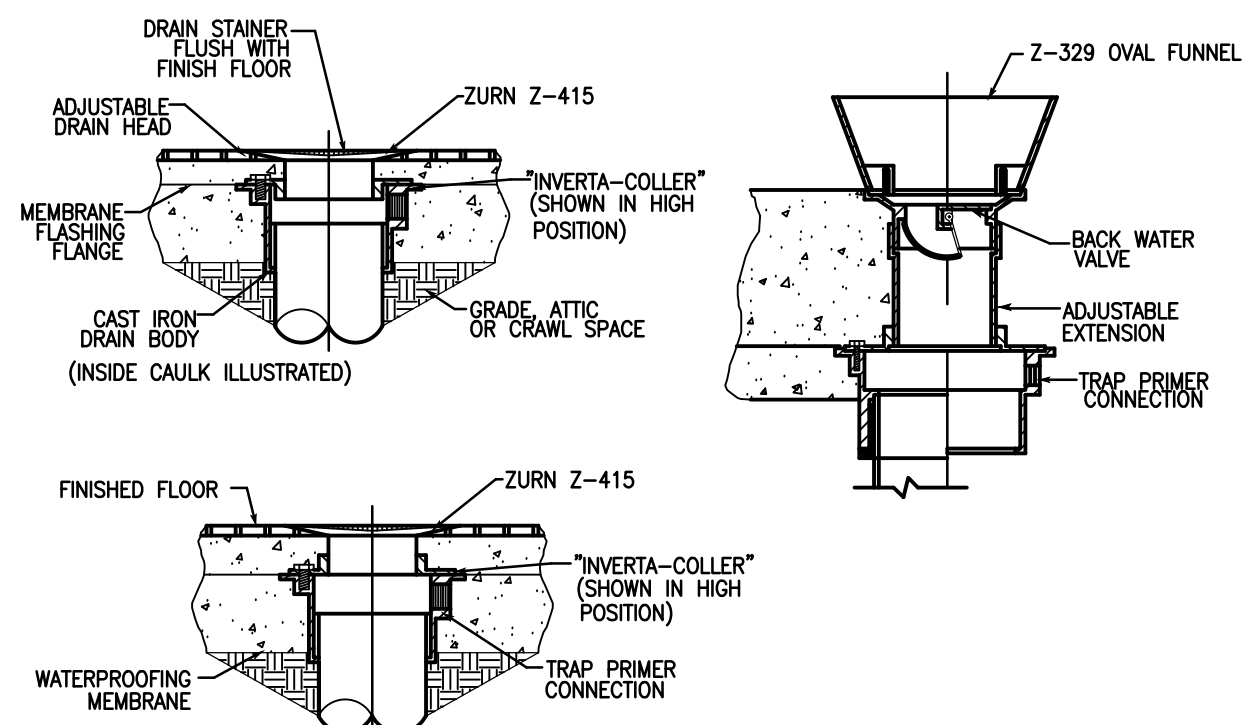
**3** FLOOR CLEANOUT-FINISHED ROOMS  
P2.0 P2.0 NOT TO SCALE



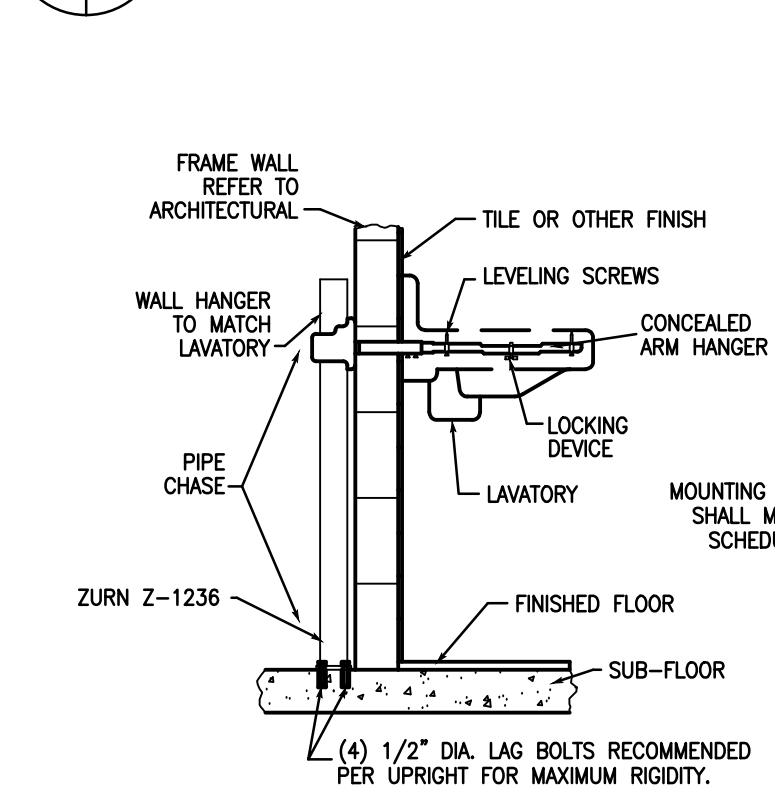
**4** WALL CLEANOUT-FINISHED ROOMS  
P2.0 P2.0 NOT TO SCALE



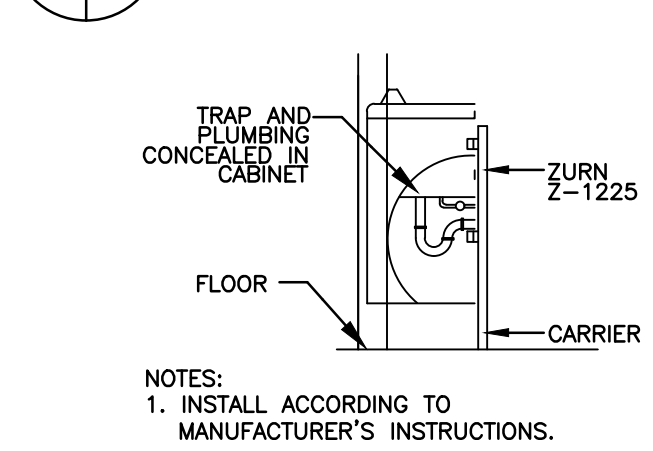
**5** VENT THRU ROOF DETAIL  
P2.0 P2.0 NOT TO SCALE



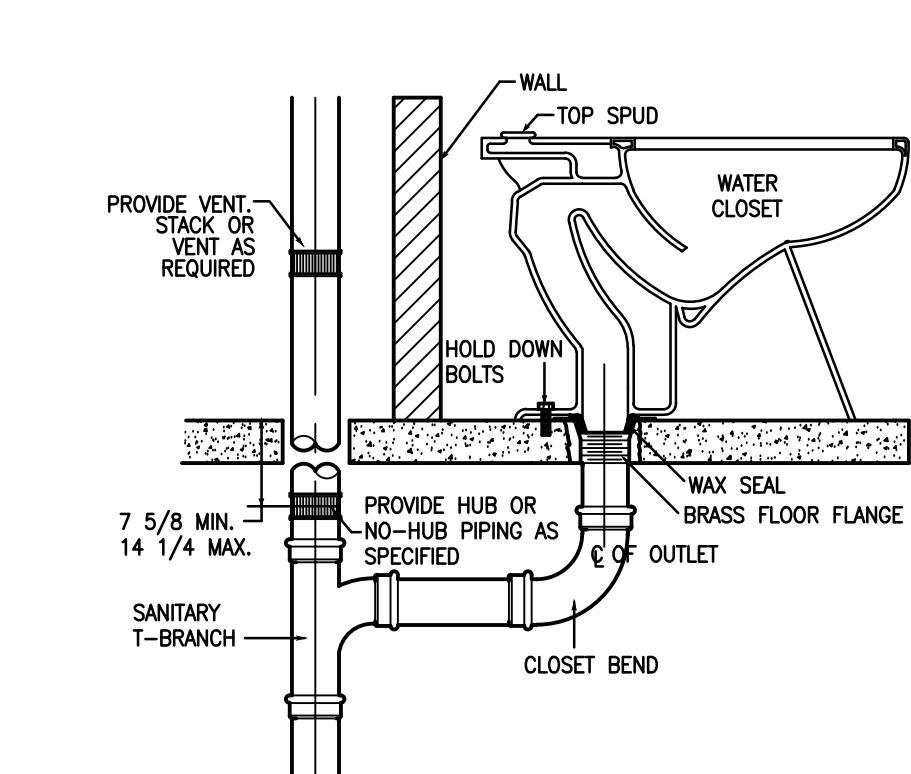
**6** TYPICAL FLOOR DRAIN INSTALLATIONS  
P2.0 P2.0 NOT TO SCALE



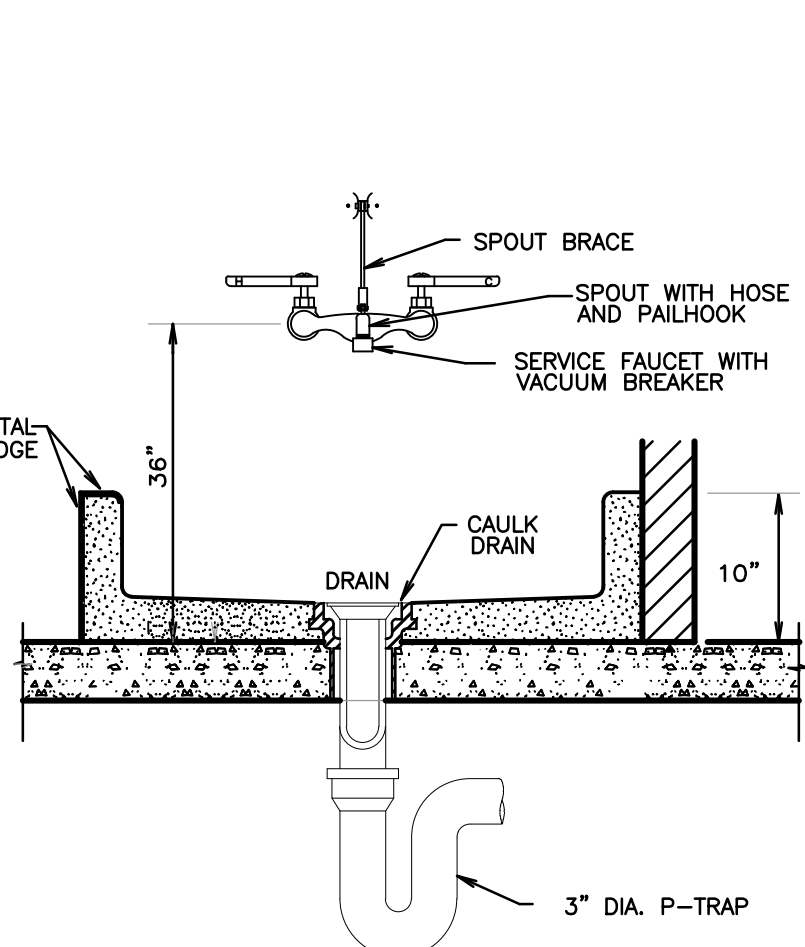
**7** TYPICAL LAVATORY INSTALLATIONS  
P2.0 P2.0 NOT TO SCALE



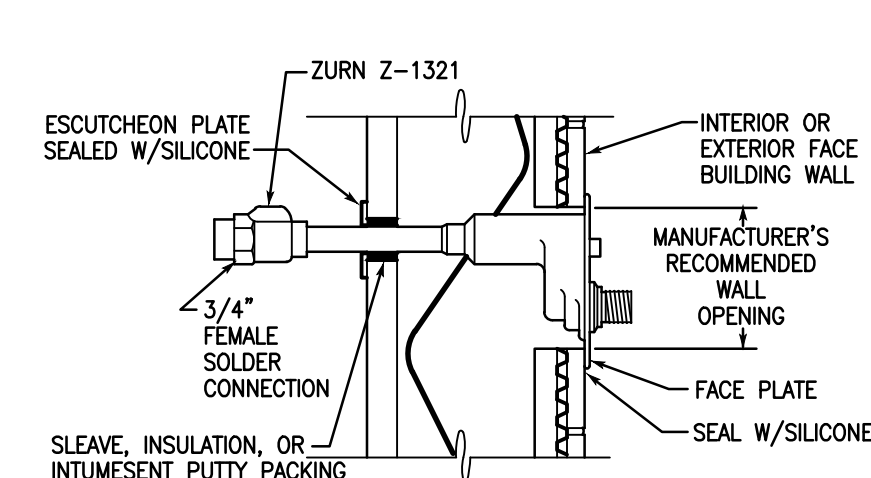
**8** WALL-HUNG DRINKING WATER COOLER  
M2.0 M2.0 NOT TO SCALE



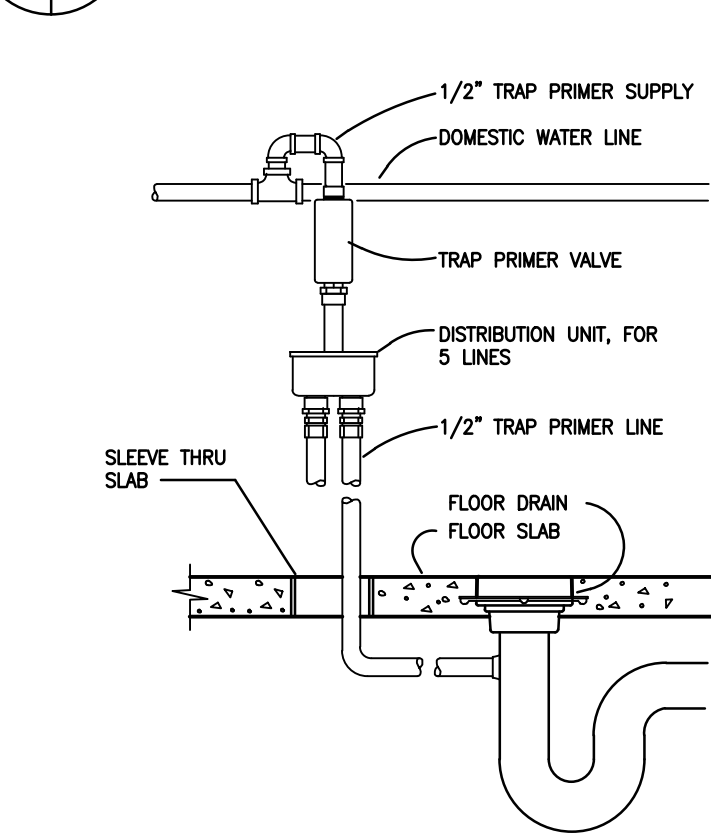
**9** TYPICAL FLOOR MOUNTED WATER CLOSET INSTALLATION  
M2.0 M2.0 NOT TO SCALE



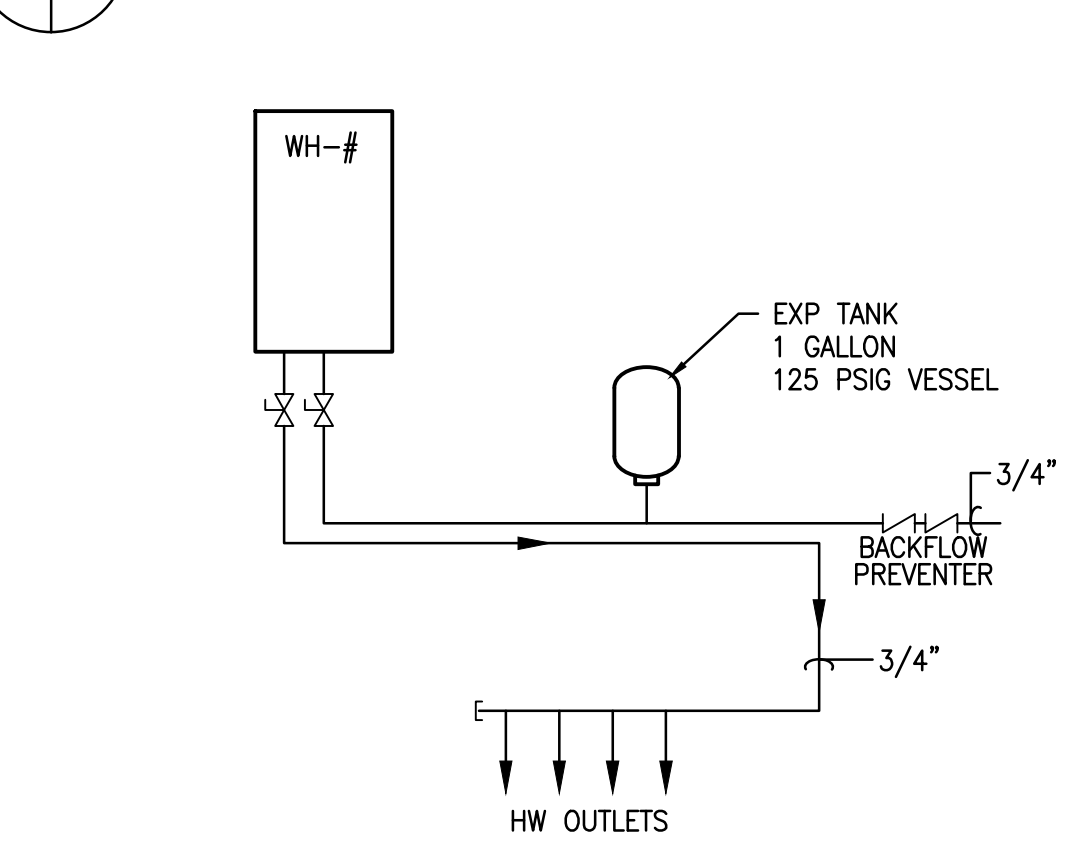
**10** MOP SINK DETAIL  
P2.0 P2.0 NOT TO SCALE



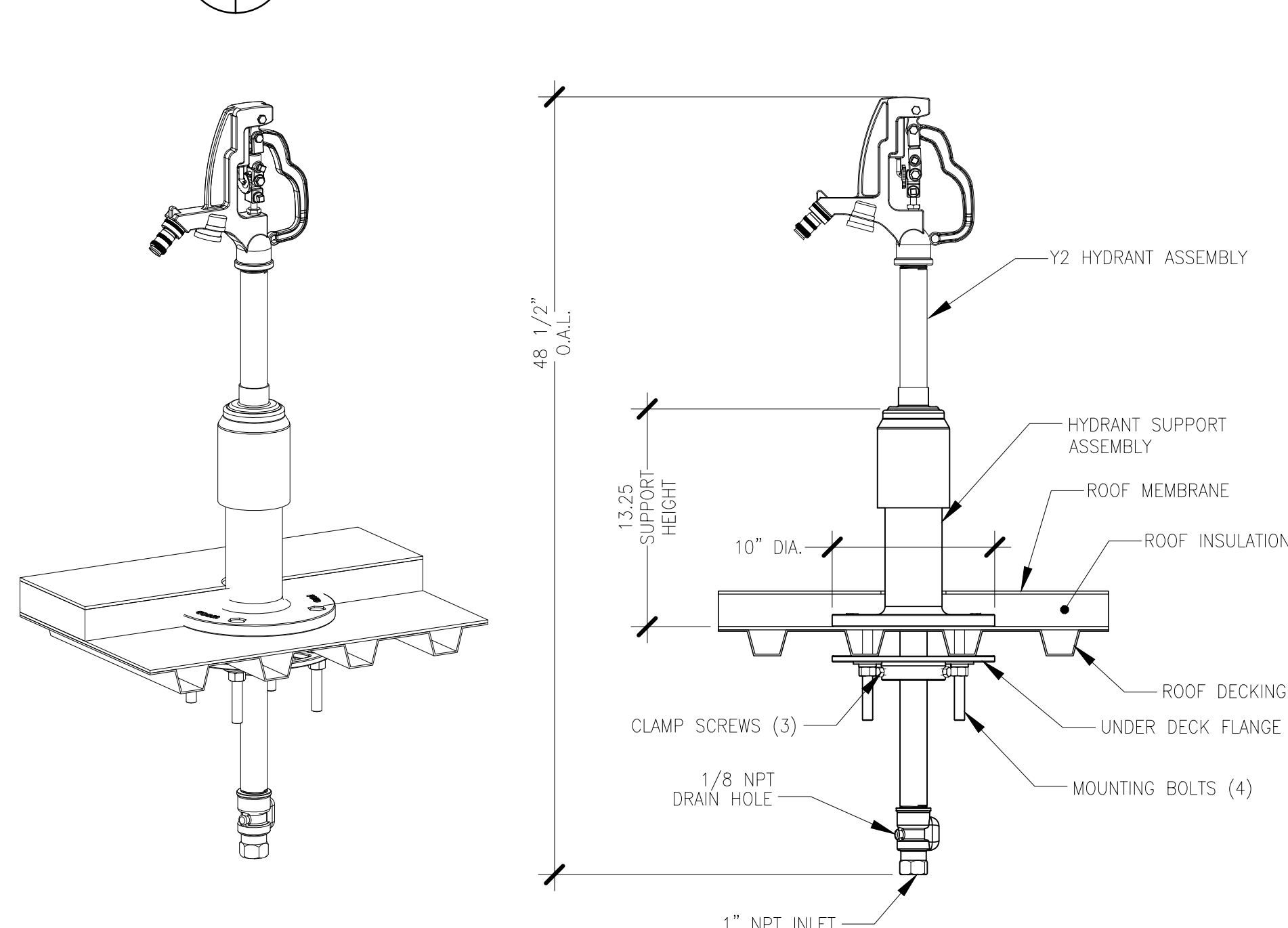
**11** EXPOSED WALL HYDRANT  
P2.0 P2.0 NOT TO SCALE



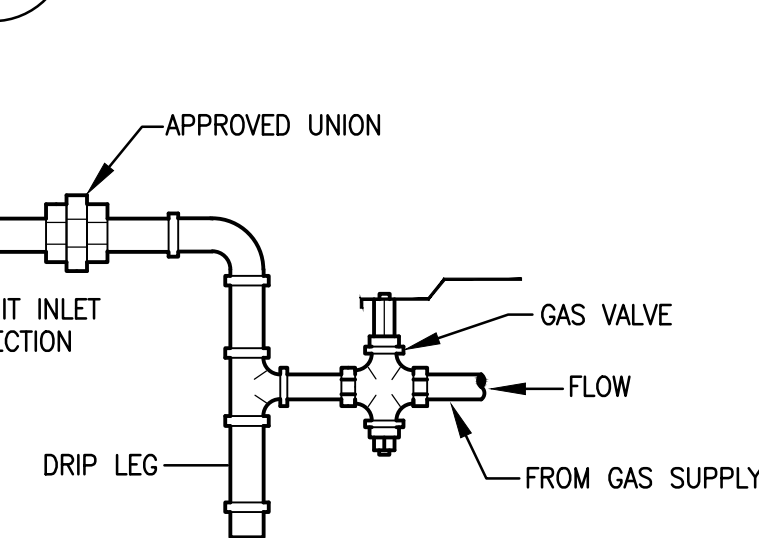
**12** TRAP SEAL PRIMER DETAIL  
P2.0 P2.0 NOT TO SCALE



**13** TANKLESS WATER HEATER INSTALLATION  
P2.0 P2.0 NOT TO SCALE



**14** FREEZELESS ROOF HYDRANT DETAIL  
P2.0 P2.0 NOT TO SCALE



**15** GAS CONNECTION DETAIL  
P2.0 P2.0 NOT TO SCALE

PLUMBING FIXTURE SCHEDULE									
MARK	FIXTURE			TRIM			REMARKS	MOUNTING HEIGHT	
	TYPE	MANU.	MODEL	TYPE	MANU.	MODEL			
SK-1	COUNTER TOP S.S. SINK	ELKAY 302	9\"/>						
WC-1	FLOOR MOUNTED FLUSH VALVE	KOHLER	HIGHLINE LITE 12-3519	ADA OPEN FRONT CONTOUR SEAT WITH CHECK	CHURCH KOHLER	9400C K-4670-C	WHITE 1.0 GAL. FLUSH WITH SLOAN ROYAL FLUSH VALVE	SEAT 17\"/>	
LAV-1	WALL MOUNT CHINA PLAT TOP	ADA COMPLIANT KOHLER	JAMESTOWN K-2053	8\"/>					
SS-1	WALL MOUNT ENAMELED CAST IRON	KOHLER	BANION K-6716/6871	8\"/>					
FD-1	3\"/>								
WCO-1	WALL CLEAN OUT W/ COVER	ZURN	Z-1446	NA			SS COVER	12\"/>	
TR-1	TRAP PRIMER FOR FLOOR DRAIN	PRECISION PLUMBING PRODUCT	P-1				PROVIDE DISTRIBUTION UNIT AS REQUIRED		
WH-1	ON DEMAND WATER HEATER	STIEBEL ELTRON	MINI 2.5	2400 WATT			21 AMP 120 VOLT	PER ARCH	
FD-2	FLOOR CLEAN OUT C.I. TYPE	ZURN	ZB-1400-K	NA			SIZE SHALL MATCH THE CONNECTED LINE	FLUSH W/ FINISH FLOOR	
EMC-1	WALL MOUNTED ELECTRIC WATER COOLER	HALSEY TAYLOR	WM-BA-2				PLATINUM VINYL 3.1A, 120V	40\"/>	
HB-1	HOSE BIBB	ZURN	Z-1321				NON-FREEZE ANTI-SIPHON AUTO DRAINING	PER ARCH	
HB-2	HOSE BIBB ROOF HYDRANT	WOODFORD	RHY-2-1-MS				FREEZELESS ROOF HYDRANT		



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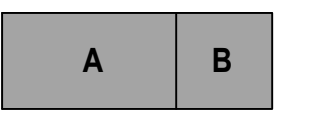
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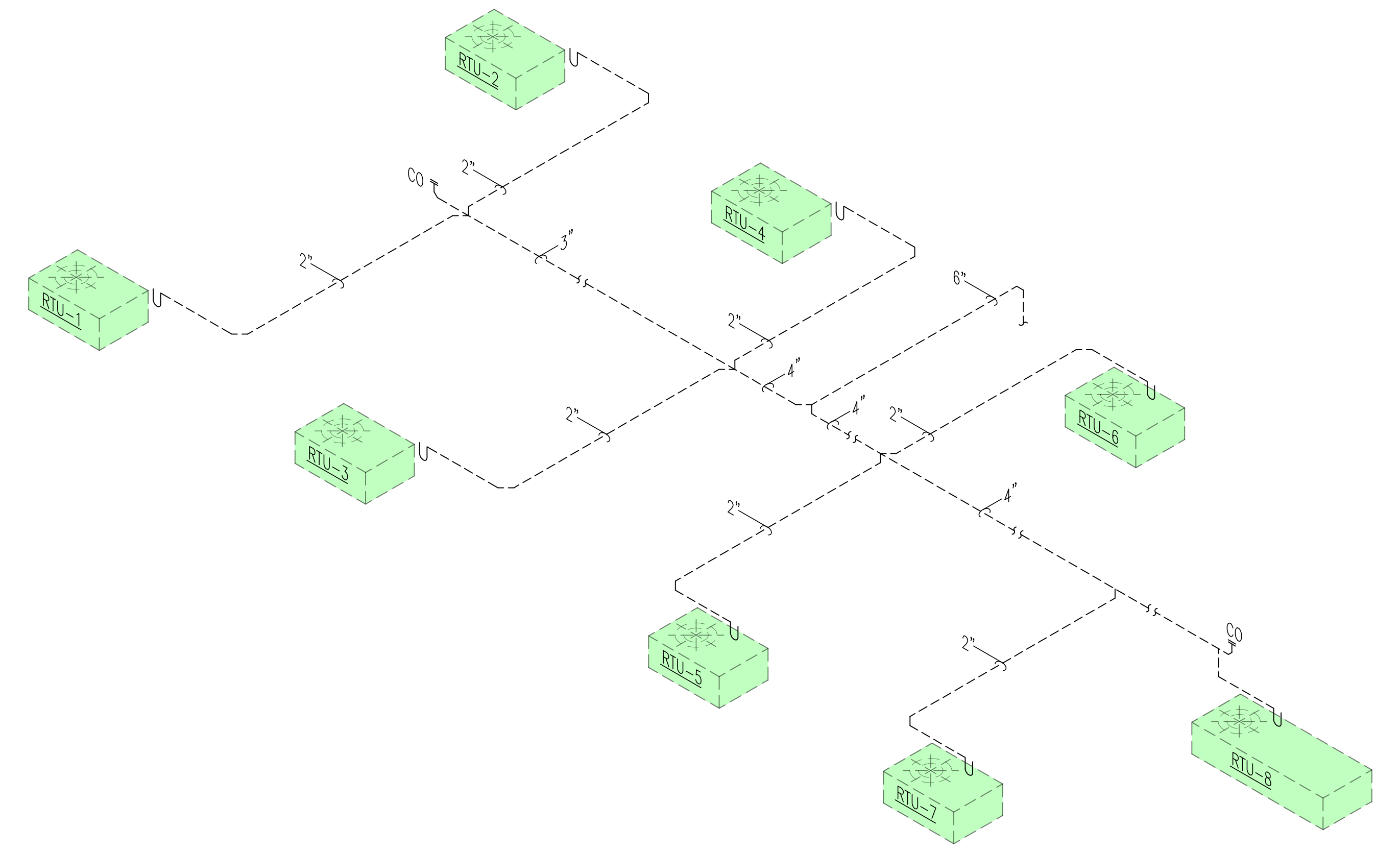
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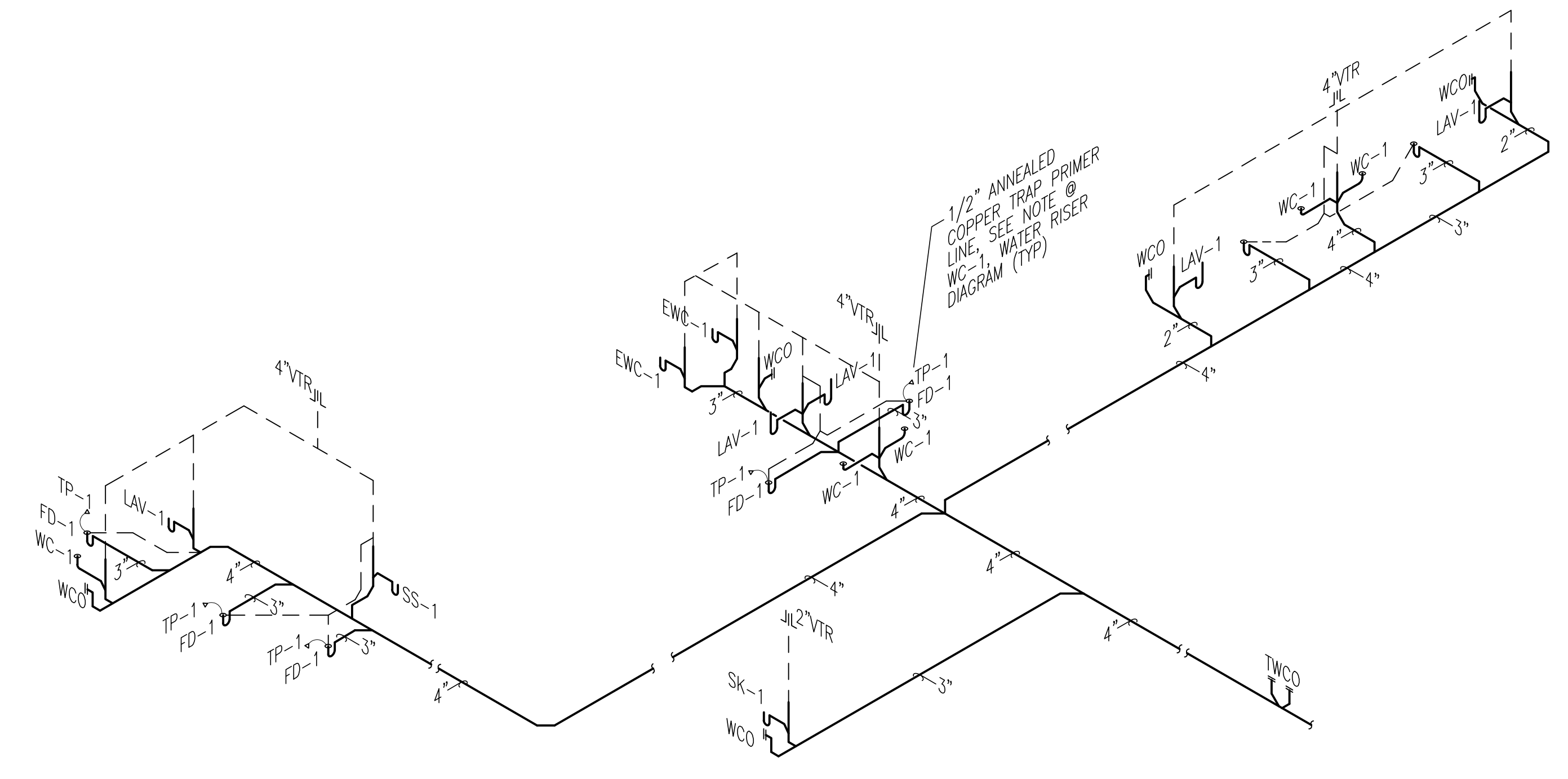
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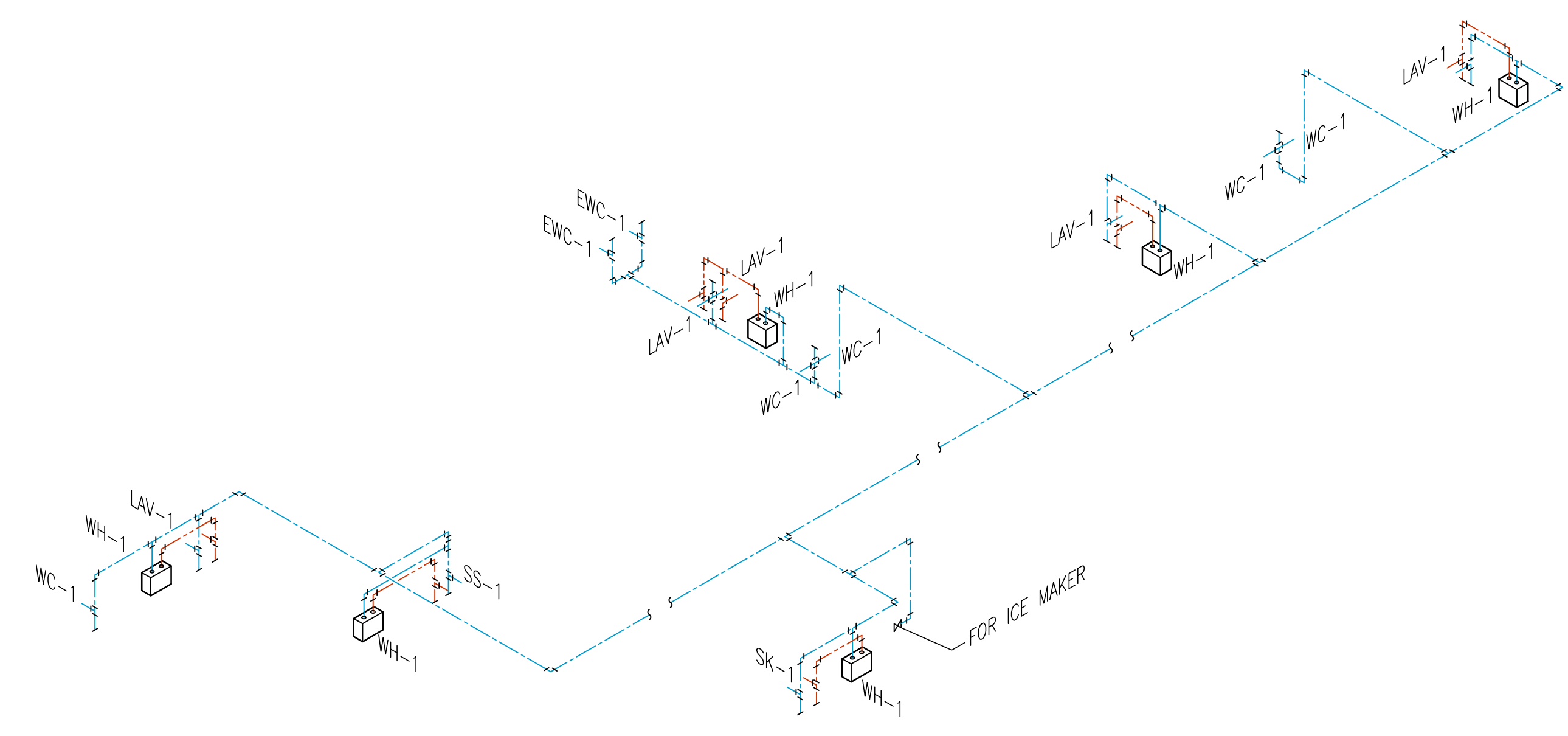
No.	Description	Date



**1** CONDENSATE DRAINS RISER DIAGRAM  
P2.1 P2.1 NOT TO SCALE



**2** SEWER RISER DIAGRAM  
P2.1 P2.1 NOT TO SCALE



**3** WATER RISER DIAGRAM  
P2.1 P2.1 NOT TO SCALE

PLUMBING FIXTURE BRANCH SIZES				
DESCRIPTION	SOIL OR WASTE	VENT	COLD WATER	HOT WATER
WATER CLOSET	4"	* 2",3",4"	3/4"	-
URINAL	2"	1 1/2"	3/4"	-
LAVATORY	2"	* 1 1/4"	1/2"	1/2"
SINK	2"	1 1/2"	1/2"	1/2"
MOP BASIN	3"	2"	3/4"	3/4"
ELECTRIC WATER COOLER	2"	1 1/4"	1/2"	-
FLOOR DRAIN	3"	2"	1/2" TRAP PRIMER	-

\* SEE SCHEMATIC PIPING

PLUMBING  
RISER DIAGRAMS

P2.1