



PROJECT MANUAL

FOR

MIMS PARK
Restroom / Concession
5400 Grishilde Drive
Mobile, Alabama 36633

Project #PR-048-24B C0037

October 16, 2024



Christian Preus Landscape Architecture, PLLC
307 De La Mare Avenue
Fairhope, Alabama 36532

City of Mobile
Architectural Engineering Department
205 Government Plaza
P.O. Box 1827
Mobile, Alabama 36633-1827

Bid Date: 11/06/2024

Set Number: _____

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SECTION 00100

INVITATION TO BID

You are invited to submit a sealed bid for construction of the following facility:

PROJECT NAME: Mims Park – Athletic Restroom / Concession
PROJECT LOCATION: 5400 Grishilde Drive, Mobile, Alabama
36633 PROJECT NUMBER: PR-048-248B

1 BID DATE:

- A. Sealed Bids will be received and clocked in until 2:15 PM local time, Wednesday, the 6th day of November, 2024. Bidders shall insert sealed Bids into a receptacle, marked “City of Mobile Bids”, located in the elevator lobby outside the office of the City Clerk Office, 9th Floor South Tower, Government Plaza, 205 Government Street, Mobile, Alabama 36602.
- B. All Bids not clocked in at the City Clerk’s Office prior to the time specified, or Bids received after the specified time, will be automatically rejected and returned immediately, unopened.
- C. Bids will be publicly opened and read at 2:30 PM local time, in the Atrium Lobby of Government Plaza.

2 SPECIFICATIONS AND DRAWINGS:

- A. Specifications and Drawings are on file and may be examined and obtained from the following location: <https://www.cityofmobile.org/bids/>
- B. Bidders shall use complete sets of Bid Documents in preparing their bid. Neither the Owner nor Architect/Engineer assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bid Documents.
- C. **Addenda will be issued via e-mail to all Pre-Bid Conference attendees.**
- D. **This is a tax exempt project and shall be certified by the requirements of the Alabama Department of Revenue. Bidders shall NOT include sales and use taxes with their bid amounts. Bidders shall complete the Sales Tax Form C-3A and include it as an attachment to their Bid Form (see Section 00400).**
- E. Bidders must be pre-qualified before submitting a bid (see Section 01400 for requirements).
- F. Product Substitutions must be pre-approved before the bid (see Section 01400 for requirements).
- G. Subcontractors must be pre-qualified before submitting a bid (see section 01400 for requirements).

3 BID SURETY: Required on Bids \$10,000.00 or more

- A. A Cashier’s Check drawn on a bank registered to do business in the State of Alabama and which is a member of the Federal Deposit Insurance Corporation, or a Bid Bond

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payable to Owner, City of Mobile, in the amount of 5% of the Base Bid, but in no event more than \$10,000.00 is required to accompany Bid.

- B. Bid Bond must be issued by a Surety licensed to do business in the State of Alabama. Bidder shall require the attorney in fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.
- C. No Bid may be modified, withdrawn, or canceled for a period of sixty (60) days after the time designated above for receipt of bids.
- D. The City of Mobile will have sixty (60) days from the bid opening date to award contract.

4 SURETY QUALIFICATIONS:

- A. A Surety authorized to do business in the State of Alabama must issue Bonds.
- B. If the Base Bid is \$50,000 or more, the Surety must have a minimum rating of A/Class VI as reported by the latest issue of Best Key Rating Guide Property-Casualty published by Alfred M. Best Company, Inc.

5 IRREGULARITIES AND REJECTION:

- A. The City of Mobile reserves the right to waive irregularities in the Bid and in Bidding, and to reject any or all Bids.

6 BIDDER QUALIFICATIONS:

- A. Bids for Work costing \$50,000 or more must be licensed pursuant to current Alabama law and of classifications compliant with the State of Alabama Licensing Board for General Contractors. Note that if the contract amount is \$10,000 or greater, both a Performance Bond and a Labor and Material Payment Bond shall be required. **Before Bidding, Contractor shall verify their license classification of their General Contractors license with the State of Alabama Licensing Board for General Contractors to verify classification is acceptable to perform 51% of the Scope of Work.**
- B. In case of a joint venture of two or more Contractors, the amount for the bid shall be within the maximum bid limitations as set by the State of Alabama Licensing Board for General Contractors of at least one of the partners to the joint venture.

7 NON-RESIDENT CONTRACTORS:

- A. Except for contracts funded in whole or part with funds received from a federal agency, preference shall be given to resident Contractors on the same basis as the nonresident Contractor's state awards contracts to Alabama Contractors bidding in similar circumstances.
- B. Nonresident Bidders shall, prior to submitting a bid, be registered with the Alabama Secretary of State and the Alabama Department of Revenue. Provide the Secretary of State Business "Entity ID Number" on the Bid Form in the space provided.

8 PRE-BID CONFERENCE:

- A. A Pre-Bid Conference shall be held on October 23, 2024, **at Mims Park Site**, at 10:00 AM local time. The conference will include a walkthrough of the site location. Social

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distancing practices shall be observed, including wearing of face coverings/masks by all participants. A representative of the Bidder is encouraged to be present at the meeting. However, if no representative can be present in person, the Bidder shall contact the Project Manager at (251) 406-2678, at least 24 hours prior to the meeting, in order to coordinate attendance of the meeting by conference call. Bidders are required to participate in the Pre-Bid Conference, visit the site prior to submitting a Bid and include all costs associated with the project in their Bids.

B. Minutes of this conference will be made as an Addendum for the project.

9 BID SUBMITTAL:

A. Bids must be submitted on copies of the Bid Forms furnished in the bidding documents.

B. Bid, with Bid Security, Sales Tax Form C-3A, City of Mobile Subcontracting and Major Supplier Plan and other supporting data specified, shall be contained in a sealed, opaque envelope, approximately 9x12 inches or larger and be marked on the outside with the words "**SEALED BID FOR MIMS PARK RESTROOM / CONCESSION AND FIELD IMPROVEMENTS - PROJECT NUMBER: PR-048-24B**".

C. The Bid envelope shall be clearly addressed to the Owner as indicated on the Bid Form and include the bid date, the name, address and State License number and classification of the Bidder issued by the State of Alabama Licensing Board for General Contractors.

D. All Bids of \$50,000 or more must include the bidder's State of Alabama General Contractor's License information written on the outside of the bid envelope. Any bid submitted without such license information may be rejected and returned to the bidder unopened.

E. In addition, in large letters on both front and back of envelope, write the following: **DO NOT OPEN UNTIL TWO-THIRTY PM, NOVEMBER 6, 2024**

F. For a bid to be valid it shall be delivered at designated location prior to time and date for receipt of Bids indicated in INVITATION TO BID, or prior to any extension thereof issued to Bidders. After that time no Bid will be received or withdrawn.

G. When sent by mail, preferably special delivery, express service, or registered mail, the sealed Bid, marked as indicated above, shall be enclosed in another envelope for mailing such that the exterior mailing container or envelope may be opened without revealing the contents of the Bid. It is the Contractors responsibility to assure delivery of the bid to the City Clerk's Office prior the time and date established.

10 EQUAL OPPORTUNITY:

A. The City of Mobile, Alabama is an Equal Opportunity Employer and requires that all Contractors comply with the Equal Employment Opportunity laws and the provisions of the Bid Documents in this regard.

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- B. The City of Mobile also encourages and supports the utilization of Minority Business Enterprises on these and all other publicly solicited Bids, and shall be in compliance with the City of Mobile's Minority Utilization Plan as adopted by the City Council.
- C. Contractor shall provide an appropriately completed copy of the "City of Mobile Subcontracting and Major Supplier Plan" in the envelope with their Bid Form. Form shall document DBE Subcontractors participating in the project and, should the total % of DBE participation not meet the 15% minimum, all efforts to obtain DBE Subcontractors shall be documented on or attached to the DBE Form when submitted. During construction, contractors are required to submit a "DBE Utilization Report" with every Pay Application.
- D. Contractors should contact the City of Mobile, Supplier Diversity Manager for assistance with DBE Subcontractor information and any questions regarding the DBE Compliance Forms. Contact Archnique Kidd at 251-208-7967.
- E. A Directory of DBE Vendors can be found at the following location:
<https://workwith.cityofmobile.org/>

11 ADDITIONAL BIDDING PROCEDURES:

- A. Refer to the complete information in the Bid Documents prior to submitting a bid. Additional Bidding Procedure information is contained therein, particularly in the specification Section 00200 "Instructions to Bidders - AIA Document A701" and in the specification Section 00300 "Supplementary Instructions to Bidders".

12 STATE OF ALABAMA IMMIGRATION ACT

"The State of Alabama, under the Beason-Hammon Alabama Taxpayer and Citizen Protection Act, Act No. 2011-535, Alabama Code Section 31-13-1, et. Seq., requires:

- A. That the Contractor shall be enrolled in the E-Verify Program, shall participate in that Program during the performance of the contract, and shall verify the immigration status of every employee who is required to be verified, according to the applicable federal rules and regulations; and
- B. That it will attach to the contract the company's documentation of enrollment in E-Verify.
- C. The subcontractor must also enroll in the E-Verify Program prior to performing any work on the contract and shall attach to its sworn affidavit documentation establishing that the subcontractor is enrolled in the E-Verify Program.

13 PUBLIC CONTRACTS WITH ENTITIES ENGAGING IN CERTAIN BOYCOTT ACTIVITIES

- A. By signing this contract, Contractor further represents and agrees that it is not currently engaged in, nor will it engage in, any boycott of a person or entity based

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in or doing business with a jurisdiction with which the State of Alabama can enjoy open trade.

14 FEDERAL CONDITIONS

- A. This project is funded by HUD through the CDBG Program and has specific regulations and requirements. These requirements include, but are not limited to, the information included in Section 00800 Supplementary Conditions (Federal Conditions).
- B. Job site postings, including the Notice to All Employees working on Federal or Federally Financed Construction Projects and the EEO (Equal Employment Opportunity) poster, will be required to be maintained and shall be in a location accessible to all employees.
- C. Employee interviews for Davis-Bacon wage compliance will be conducted with the assistance of the Project Manager, as coordinated with the Contractor. Certified Payrolls are required. Contractors may become more familiar with these procedures by viewing "A Contractor's Guide to Prevailing Wage Requirements for Federally-Assisted Construction Projects", on-line at <http://portal.hud.gov/hudportal/documents/huddoc?id=DOC12590.pdf>

15 FEDERAL CONDITIONS

- A. This project is covered by the Davis Bacon and Related Acts (DBRA). See Section 00800 Federal Conditions.

END OF SECTION 00100

SECTION 00200

INSTRUCTIONS TO BIDDERS

USE THIS FORM IF YOU ARE **NOT** USING AN AIA CONTRACT

THE ATTENTION OF ALL BIDDERS IS CALLED TO THE FOLLOWING INSTRUCTIONS AND CONDITIONS:

I. BIDDING DOCUMENTS:

- A. Bidders may obtain complete sets of Bid Documents and Specifications (Project Manual) from the Department of Architectural Engineering as listed in the Invitation to Bid.
- B. Bidders shall use the complete set of documents in preparing their bid. The City of Mobile assumes no responsibility for errors or misinterpretations resulting from use of an incomplete set of documents.

2. INTERPRETATION OF BID DOCUMENTS:

- A. Bidders shall carefully study and compare the Bidding Documents and compare various components of the Bidding Documents with each other, shall examine the site and local conditions and shall at once report to the Project Manager any errors, inconsistencies or ambiguities discovered.
- B. Bidders requiring clarification or interpretation of the Bidding Documents shall make a written request to the Project Manager by 3:00 PM at least five (5) calendar days prior to the date for receipt of Bids. E-mail requests are required and should be addressed to christian@christianpreus.com
- C. Interpretations, corrections and changes to the Bidding Documents will be made by a formal, written Addendum. Interpretations, corrections and changes to the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely on them.
- D. Any discrepancy not resolved prior to Bidding shall be bid by the Contractor to provide for the most costly and/or restrictive interpretation of the documents.

3. BIDDING PROCEDURES:

- A. No Bid will be considered unless made out and submitted on a copy of the Bid Form as set forth by the Bid Documents.
- B. All blanks on the Bid Form shall be legibly executed in a non-erasable medium.
- C. Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.
- D. Interlineations, alterations and erasures must be initialed by the signer of the Bid.

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- E. All requested Alternates, Unit Prices and Allowances shall be bid as indicated on the Bid Form and the Bid Documents.
- F. Addenda shall be considered as a part of the Bid Documents and those issued prior to the opening of Bids shall be acknowledged on the Bid Form and any adjustment in cost shall be included in the Contract Sum.

4. BID SECURITY:

- A. Bid Bond shall be valid for a minimum of sixty (60) days from the date of the Bid. The Owner reserves the right to retain the security of all Bidders until the successful Bidder enters into the Contract or until (60) days after Bid opening, whichever is sooner.
- B. Bonds must be issued by a Surety licensed to do business in the State of Alabama. If the project cost is more than \$50,000.00 the Surety must have a minimum rating of A/Class VI as reported by the latest issue of Best's Key Rating Guide Property-Casualty published by Alfred M. Best Company, Inc.
- C. Power of Attorney is required for all Bonds.

5. EXAMINATION OF DOCUMENTS AND SITE WORK:

- A. Before submitting a Bid, Bidders should carefully examine the Bid Documents, visit the site of the Work, including attendance at the Pre-Bid conference, fully inform themselves as to existing conditions and limitations, and include in the Bid a sum to cover the cost of all items included in the Contract and necessary to perform the Work. The submission of a Bid will be considered as conclusive evidence that the Bidder has made such examination.

6. SUBMISSION OF BIDS:

- A. Bid, with Bid Security, Sales Tax Form C-3A, and other supporting data specified, shall be contained in a sealed, opaque envelope, approximately 9x12 inches or larger and be marked on the outside with the words "SEALED BID FOR MIMS PARK –RESTROOM / CONCESSION - PROJECT NUMBER: PR-039-22", the Bid Date, and Contractor's name, address, and City of Mobile Business License number. And, if bidding in an amount \$50,000 or greater, the State of Alabama General Contractor's License number and classification of the Bidder issued by the State of Alabama Licensing Board for General Contractors shall be written on the envelope.
- B. Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date specified in the Invitation to Bid, or as modified by Addendum, will not be considered. Late Bids will be returned to the Bidder unopened.
- C. The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

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- D. Oral, telephonic, facsimile or other electronically transmitted bids will not be considered.

7. MODIFICATION OR WITHDRAWAL OF BIDS:

- A. A Bid may not be modified, withdrawn, or canceled by the Bidder for a period of sixty (60) days following the time and date designated for receipt of bids, and each Bidder so agrees in submitting a Bid.

8. CONSIDERATION AND AWARD OF BIDS:

- A. At the discretion of the City, the properly identified Bids received on time will be publicly opened and will be read aloud.
- B. The City shall have the right to reject any and all Bids. A Bid not accompanied by a required Bid security or a Bid which is in any way incomplete or irregular is subject to rejection.
- C. It is the intent of the City to award a Contract to the lowest qualified Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The City shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the City's judgment, is in the City's best interest.
- D. The award shall be based on the lowest Total Bid for the Base Bid and any allowances, plus any alternates that may be accepted, as listed on the Bid Form.

9. PROOF OF COMPETENCY OF BIDDER:

- A. Bidders may be required to furnish evidence satisfactory to the City of Mobile that they have sufficient means and experience in the types of work called for to assure the completion of the Contract in a satisfactory manner.

10. SIGNING OF CONTRACT:

- A. The Standard Agreement between the City of Mobile and the Contractor, included herein, shall serve as the Agreement between the City and the Contractor.
- B. The Bidder to whom the Contract is awarded shall, within ten (10) calendar days of receiving the Contract Forms, properly execute and deliver to the Owner, the following items with the signed Agreement:
 - (1). Performance Bond and Labor and Material Payment Bond (originals);
 - (2). Certificate of Insurance (original) with endorsements to City of Mobile;
 - (3). Evidence of enrollment in the E-Verify program.
 - (4). Other documentation as required by the Contract Documents.
- C. Failure or refusal to sign the Agreement or to provide Certificates of Insurance in a form satisfactory to the City of Mobile, E-Verify verification, or other

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required documentation, shall subject the Bidder to immediate forfeiture of Bid Security.

- D. On all documents: City of Mobile Business License, the Alabama Secretary of State Business Identity, the Alabama Secretary of State Certificate of Authority (out of state contractors), E-verify documentation, and ACORD Insurance Form, the Contractors name shall be EXACTLY the same.

11. NONDISCRIMINATION:

- A. Contractor shall comply with all Federal, State and local laws concerning discrimination, including Section 14.1 and Section 14.2, Code of the City of Mobile, adopted December 10, 1991.

12. AMERICANS WITH DISABILITIES ACT (ADA):

- A. Bidders shall comply with the provisions of the Americans with Disabilities Act (ADA) of 1990 which prohibits discrimination against individuals with disabilities.

13. USE OF DOMESTIC PRODUCTS:

- A. Section 39-3-1, Alabama Code, 1975, provides that the Contractor agree, in the execution of this Contract, to use materials, supplies and products manufactured, mined, processed or otherwise produced in the United States or its territories, if available at reasonable prices, and that breach of this Agreement by the Contractor shall result in the assessment of liquidated damages in an amount not less than \$500.00 nor more than twenty (20) percent of gross amount of the Contract Price.

14. NON-RESIDENT (OUT OF STATE) CONTRACTORS:

- A. Preference to Resident Contractors: Section 39-3-5, Code of Alabama, 1975, provides that a non-resident (out of State) bidder domiciled in a state which grants a preference to local Contractors is to be awarded a public contract on the same basis as the non-resident bidder's state awards contracts to Alabama bidders. Alabama bidders are given a preference to the same extent that a non-resident bidder receives a preference in his home state. A non-resident bidder must include with any written bid documents a written opinion of an attorney licensed to practice in the non-resident bidder's state declaring what preferences, if any, exists in the non-resident's state.
- B. Certificate of Authority: All non-resident (out of State) corporations must register with the Secretary of State and obtain a Certificate of Authority before doing business in the State of Alabama. Out of state Bidders should register and secure the required Certificate before submitting a Bid. The account number shall be included on the Bid Form.

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15. ALABAMA IMMIGRATION ACT:

- A. The State of Alabama Immigration Law (Act No. 2011-535 as amended by Act No. 2012-491), requires that Contractors not violate federal immigration law or knowingly employ, hire for employment, or continue to employ an unauthorized alien within the State of Alabama. In addition, Contractors are required to enroll in the federal E-Verify program and submit verification of enrollment to the City of Mobile within ten (10) days of receiving the contract forms (see Section 00600).

16. CITY OF MOBILE BUSINESS LICENSE:

- A. A City of Mobile Business License is required and must be current at time of contract award and throughout contract period.

17. CITY OF MOBILE CONTRACTOR'S BUSINESS LICENSE:

- A. A City of Mobile Contractor's Business License is required and must be current at time of contract award and throughout contract period.
- B. Contractor must qualify and post a \$10,000 surety bond with the Land Use/Code Administration Department before a Contractor's Business License will be issued by the Revenue Department. Information on the City Contractor's License may be obtained by writing or calling:

Land Use/Code Administration
P.O. Box 1827
Mobile, Alabama 36633-1827
Phone: 251-208-7421

Revenue Department
P.O. Box 1827
Mobile, Alabama 36633-1827
Phone: 251-208-7461

18. CITY OF MOBILE BUILDING PERMIT:

- A. A City of Mobile Building Permit is required and shall be obtained from the City of Mobile, but at no cost to the Contractor.
- B. Contractor is responsible for ensuring that all inspections are successfully performed in accordance with City of Mobile regulations.

19. CONSTRUCTION SCHEDULE AND ACCESS:

- A. The project shall be completed within two hundred and seventy (270) days from the date indicated by the Notice to Proceed. Contract days are defined as 'calendar days', which **include** weekends and holidays.
- B. Mims Park will remain in use throughout the Construction period and the Contractor is directed to coordinate all areas of work and scheduling of work with the Owner. Within five days of the bid opening, the Apparent Low Bidder Contractor shall meet with the Owner to discuss Owner scheduling and priorities.

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Apparent Low Bidder shall then provide a proposed schedule within 5 calendar days of the initial meeting for Owner review and approval.

- C. Contractor shall have access to Mims Park as approved by the Owner, but typically **Monday through Friday from 7:30 A.M. to 4:30 P.M** Contractor is directed to coordinate all areas of work and scheduling with the Owner. After hours and weekend work will require prior approval of the City of Mobile and may require hiring of a guard at the contractor's expense.
- D. The Contractor may be allowed additional construction days due to inclement conditions ("rain days") only as such are appropriately documented and are in excess of the NOAA/National Weather Service average (previous 5 years) for the given month. A "rain day" is defined as more than a "trace" (0.10") of rain falling within a given 24 hour period. The Contractor shall provide documentation and formally request any "rain days" they feel are legitimately due. Documentation shall be submitted to the Project Manager, in writing, within ten (10) calendar days of the rain event. Claim shall include documentation of trades adversely impacted and the impacted activities of each trade.

20. SITE CONSIDERATIONS:

- A. It is the Contractor's responsibility to carefully remove and store any items not permanently installed within the work areas. It is recommended that the Contractor photograph, videotape or in some manner document any features to be removed and their condition, prior to removal.
- B. Noise and strong smells shall be isolated or kept to a minimum when adjacent portions of the site are occupied.
- C. Contractor shall be responsible to leave the work area and adjacent site clear of equipment and debris, etc. at the end of each work day. All final cleaning is the responsibility of the Contractor and shall be executed prior to acceptance for reuse of any portion of the site.
- D. A dumpster and lay down area for Contractor materials and staging may be located at the site and located per the direction of the Owner. The Contractor is responsible for the removal of the dumpster, any storage containers and any security fencing, temporary erosion control (BMPs), etc. as soon as practical after their use by the Contractor or the work is complete.

21. SALES AND USE TAX EXEMPTION:

- A. As per the State of Alabama ACT 2013-205, the Alabama Department of Revenue (ADOR) has been granted the authority to issue a "Certificate of Exemption from Sales and Use Tax for Governmental Entities" on construction projects. Therefore, this project shall qualify for State of Alabama Sales and Use Tax Exemptions under this ACT. It is the responsibility of the Bidder to confirm the potential tax exempt status of their bid with the ADOR and include any such

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savings in their bid, as well as accounting for same on their bid form attachment Sales Tax Form C-3A.

- B. The full text of ACT 2013-205 is available on the State of Alabama Building Commission web-site at www.bc.alabama.gov .

22. SUBMISSION OF LIEN WAIVERS

- A. At each monthly Application for Payment submitted to the owner, the Contractor shall provide completed lien waivers, including those from Subcontractors and material suppliers.

23. NOTICE OF COMPLETION:

- A. For Contracts \$50,000 or less:
Contractor shall provide proof of publication of Notice of Completion one time in a local newspaper, as required in the Title 39, Section 39-1-1, Subsection (g), of the Code of Alabama. Contractor shall also provide an electronic or hard copy of advertisement verbiage to the City of Mobile on Contractor letterhead for public posting for one week. This advertisement shall not begin until the Project has been accepted by the City of Mobile.
- B. For Contracts \$50,000 or greater:
Contractor shall provide proof of publication of Notice of Completion four successive weeks in a local newspaper, as required in the Title 39, Section 39-1-1, Subsection (f), of the Code of Alabama. This advertisement shall not begin until the Project has been accepted by the City of Mobile.
- C. Notice of Completion advertisement shall read as follows:

STATE OF ALABAMA

COUNTY OF MOBILE

NOTICE OF COMPLETION

In accordance with Chapter 1, Title 39, Code of Alabama, 1975, NOTICE IS HEREBY given that (COMPANY NAME) has completed the contract for City of Mobile, Alabama, MIMS PARK –RESTROOM / CONCESSION - PROJECT NUMBER: PR-039-22, in Mobile, Alabama. All persons having any claims for labor, material or otherwise in connection with this project should immediately notify the Architectural Engineering Department, City of Mobile, P.O. Box 1827, Mobile, Alabama 36633-1827.

- C. Advertisement shall not begin until the Project has been accepted by the City of Mobile as Substantially Complete.

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24. CONTRACTOR WARRANTY AND CERTIFICATION:

- A. Upon completion of the contract, the Contractor shall certify under oath that all bills have been paid in full.
- B. Contractor shall provide a one year Labor and Materials Warranty on company letterhead in addition to other warranties required by the Bid Documents.

25. LIQUIDATED DAMAGES

- A. A time charge equal to Two Hundred Fifty Dollars (\$250.00) per calendar day will be made against the Contractor for the entire period that any part of the Work remains uncompleted, or any required closeout documents are not acceptably submitted, for more than thirty (30) calendar days after the time specified for the Substantial Completion for the Work, the amount of which shall be deducted by the owner, and shall be retained by the Owner out of monies otherwise due the Contractor at the final payment, not as a penalty, but as liquidated damages sustained.

END OF SECTION

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SECTION 00200
INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

- A. This section includes the INSTRUCTIONS TO BIDDERS, AIA Document A701 to be utilized with the Owner's most recent modifications and which shall be used in conjunction with the entire Bid Documents and Section 00300 SUPPLEMENTARY INSTRUCTIONS TO BIDDERS for this project.

SECTION 00300
SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

**THE ATTENTION OF ALL BIDDERS IS CALLED TO THE FOLLOWING
INSTRUCTIONS AND CONDITIONS:**

I. BIDDING DOCUMENTS:

- A. Bidders may obtain complete sets of Bid Documents and Specifications (Project Manual) from the Department of Architectural Engineering as listed in the Invitation to Bid.
- B. Bidders shall use the complete set of documents in preparing their bid. Neither the City of Mobile nor the Landscape Architect, assume responsibility for errors or misinterpretations resulting from use of an incomplete set of documents.

2. INTERPRETATION OF BID DOCUMENTS:

- A. Bidders shall carefully study and compare the Bidding Documents and compare various components of the Bidding Documents with each other, shall examine the site and local conditions and shall at once report to the Project Manager any errors, inconsistencies or ambiguities discovered.
- B. Bidders requiring clarification or interpretation of the Bidding Documents shall make a written request to the Project Manager by 3:00 PM at least five (5) calendar days prior to the date for receipt of Bids. E-mail requests are required and should be addressed to christian@christianpreus.com Interpretations, corrections and changes to the Bidding Documents will be made by a formal, written Addendum. Interpretations, corrections and changes to the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely on them.
- C. Any discrepancy not resolved prior to Bidding shall be bid by the Contractor to provide for the most costly and/or restrictive interpretation of the documents.

3. BIDDING PROCEDURES:

- A. No Bid will be considered unless made out and submitted on a copy of the Bid Form as set forth by the Bid Documents.
- B. All blanks on the Bid Form shall be legibly executed in a non-erasable medium.
- C. Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.
- D. Interlineations, alterations and erasures must be initialed by the signer of the Bid.

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- E. All requested Alternates, Unit Prices and Allowances shall be bid as indicated on the Bid Form and the Bid Documents.
- F. Addenda shall be considered as a part of the Bid Documents and those issued prior to the opening of Bids shall be acknowledged on the Bid Form and any adjustment in cost shall be included in the Contract Sum.

4. BID SECURITY:

- A. A Cashier's Check drawn on a bank registered to do business in the State of Alabama and which is a member of the Federal Deposit Insurance Corporation, or Bid Bond payable to Owner, City of Mobile, in the amount of 5% of the Base Bid, but in no event more than \$10,000.00, must accompany bid. By submitting a Bid Security, the Bidder pledges to enter into a Contract with the City of Mobile on the terms stated in the Bid, and will, if required, furnish bonds covering faithful performance of the Contract and required insurance certificate. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds or insurance or any other required document, the amount of the Bid security shall be forfeited to the Owner as liquidated damages, not as a penalty.
- B. Bid Bond shall be valid for a minimum of sixty (60) days from the date of the Bid. The Owner reserves the right to retain the security of all Bidders until the successful Bidder enters into the Contract or until (60) days after Bid opening, whichever is sooner.
- C. Bonds must be issued by a Surety licensed to do business in the State of Alabama. If the project cost is more than \$50,000.00 the Surety must have a minimum rating of A/Class VI as reported by the latest issue of Best's Key Rating Guide Property-Casualty published by Alfred M. Best Company, Inc.
- D. Power of Attorney is required for all Bonds.
- E. The Surety company shall be required to execute AIA Document G-707, "Consent of Surety to Final Payment" prior to Final Payment of retainage being made to the Contractor.

5. EXAMINATION OF DOCUMENTS AND SITE WORK:

- A. Before submitting a Bid, Bidders should carefully examine the Bid Documents, visit the site of the Work, including attendance at the Pre-Bid conference, fully inform themselves as to existing conditions and limitations, and include in the Bid a sum to cover the cost of all items included in the Contract and necessary to perform the Work. The submission of a Bid will be considered as conclusive evidence that the Bidder has made such examination.

6. SUBMISSION OF BIDS:

- A. Bid, with Bid Security, Sales Tax Form C-3A, City of Mobile Subcontracting & Major Supplier Plan and other supporting data specified, shall be contained in a sealed, opaque envelope, approximately 9 x 12 inches or larger and be marked

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on the outside with the words "SEALED BID MIMS PARK RESTROOM AND CONCESSION PR-048-24B", the Bid Date, and Contractor's name, address, and City of Mobile Business License number. And, if bidding in an amount \$50,000 or greater, the State of Alabama General Contractor's License number and classification of the Bidder issued by the State of Alabama Licensing Board for General Contractors shall be written on the envelope.

- B. Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date specified in the Invitation to Bid, or as modified by Addendum, will not be considered. Late Bids will be returned to the Bidder unopened.
- C. The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.
- D. Oral, telephonic, facsimile or other electronically transmitted bids will not be considered.

7. MODIFICATION OR WITHDRAWAL OF BIDS:

- A. A Bid may not be modified, withdrawn, or canceled by the Bidder for a period of sixty (60) days following the time and date designated for receipt of bids, and each Bidder so agrees in submitting a Bid.

8. CONSIDERATION AND AWARD OF BIDS:

- A. At the discretion of the City, the properly identified Bids received on time will be publicly opened and will be read aloud.
- B. The City shall have the right to reject any and all Bids. A Bid not accompanied by a required Bid security or a Bid which is in any way incomplete or irregular is subject to rejection.
- C. It is the intent of the City to award a Contract to the lowest qualified Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The City shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the City's judgment, is in the City's best interest.
- D. The award shall be based on the lowest Total Bid for the Base Bid and any allowances, plus any alternates and/or options that may be accepted, as listed on the Bid Form.

9. PROOF OF COMPETENCY OF BIDDER:

- A. Bidders may be required to furnish evidence satisfactory to the City of Mobile that they have sufficient means and experience in the types of work called for to assure the completion of the Contract in a satisfactory manner.

10. SIGNING OF CONTRACT:

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- A. The Standard Agreement between the City of Mobile and the Contractor, included herein, shall serve as the Agreement between the City and the Contractor.
- B. The Bidder to whom the Contract is awarded shall, within ten (10) calendar days of receiving the Contract Forms, properly execute and deliver to the Owner, the following items with the signed Agreement:
 - (1). Performance Bond and Labor and Material Payment Bond (originals);
 - (2). Certificate of Insurance (original) with endorsements to City of Mobile;
 - (3). Evidence of enrollment in the E-Verify program.
 - (4). Other documentation as required by the Contract Documents.
- C. Failure or refusal to sign the Agreement or to provide Certificates of Insurance in a form satisfactory to the City of Mobile, E-Verify verification, or other required documentation, shall subject the Bidder to immediate forfeiture of Bid Security.
- D. On all documents: City of Mobile Business License, the Alabama Secretary of State Business Identity, the Alabama Secretary of State Certificate of Authority (out of state contractors), E-verify documentation, and ACORD Insurance Form, the Contractor's name shall be EXACTLY the same.

11. NONDISCRIMINATION:

- A. Contractor shall comply with all Federal, State and local laws concerning nondiscrimination, including but not limited to City of Mobile Ordinance No. 14-034 which requires, inter alia, that all contractors performing work for the City of Mobile not discriminate on the basis of race, creed, color, national origin or disability, require that all subcontractors they engage do the same, and make every reasonable effort to assure that fifteen percent of the work performed under contract be awarded to socially and economically disadvantaged individuals and business entities.

12. AMERICANS WITH DISABILITIES ACT (ADA):

- A. Bidders shall comply with the provisions of the Americans with Disabilities Act (ADA) of 1990 which prohibits discrimination against individuals with disabilities.

13. USE OF DOMESTIC PRODUCTS:

- A. Section 39-3-1, Alabama Code, 1975, provides that the Contractor agree, in the execution of this Contract, to use materials, supplies and products manufactured, mined, processed or otherwise produced in the United States or its territories, if available at reasonable prices, and that breach of this Agreement by the Contractor shall result in the assessment of liquidated damages in an amount not less than \$500.00 nor more than twenty (20) percent of gross amount of the Contract Price.

14. NON-RESIDENT (OUT OF STATE) CONTRACTORS:

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- A. Preference to Resident Contractors: Section 39-3-5, Code of Alabama, 1975, provides that a non-resident (out of State) bidder domiciled in a state which grants a preference to local Contractors is to be awarded a public contract on the same basis as the non-resident bidder's state awards contracts to Alabama bidders. Alabama bidders are given a preference to the same extent that a non-resident bidder receives a preference in his home state. A non-resident bidder must include with any written bid documents a written opinion of an attorney licensed to practice in the non-resident bidder's state declaring what preferences, if any, exists in the non-resident's state.
- B. Certificate of Authority: All non-resident (out of State) bidders shall be registered with the Alabama Secretary of State and the Alabama Department of Revenue prior to submitting a Bid. Provide the Secretary of State Business "Entity ID Number" on the Bid Form in the space provided.

15. ALABAMA IMMIGRATION ACT:

- A. The State of Alabama Immigration Law (Act No. 2011-535 as amended by Act No. 2012-491), requires that Contractors not violate federal immigration law or knowingly employ, hire for employment, or continue to employ an unauthorized alien within the State of Alabama. In addition, Contractors are required to enroll in the federal E-Verify program and submit verification of enrollment to the City of Mobile within ten (10) days of receiving the contract forms (see Section 00600).

16. CITY OF MOBILE BUSINESS LICENSE:

- A. A City of Mobile Business License is required and must be current at time of contract award and throughout contract period.

17. CITY OF MOBILE CONTRACTOR'S BUSINESS LICENSE:

- A. A City of Mobile Contractor's Business License is required and must be current when contractor signs the contract and throughout contract period.
- B. Contractor must qualify and post a \$10,000 surety bond with the Land Use/Code Administration Department before a Contractor's Business License will be issued by the Revenue Department. Information on the City Contractor's License may be obtained by writing or calling:

Land Use/Code Administration
P.O. Box 1827
Mobile, Alabama 36633-1827
Phone: 251-208-7421

Revenue Department
P.O. Box 1827
Mobile, Alabama 36633-1827
Phone: 251-208-7461


18. CITY OF MOBILE BUILDING PERMIT:

- A. A City of Mobile Building Permit/Electrical Permit/Plumbing Permit/HVAC Permit/Whatever Permit is required and shall be obtained from the Land Use/Code Administration Department, but at no cost to the Contractor.

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- B. Contractor is responsible for ensuring that all inspections are successfully performed in accordance with City of Mobile regulations.

19. CONSTRUCTION SCHEDULE AND ACCESS:

- A. The project shall be completed within two hundred and seventy (270) calendar days from the date indicated by the Notice to Proceed.
- B. At all buildings that will remain in use throughout the Construction period, the Contractor is directed to coordinate all areas of work and scheduling of work with the Owner. Within five days of the bid opening, the Apparent Low Bidder shall meet with the Owner to discuss Owner scheduling and priorities. Apparent Low Bidder shall then provide a proposed schedule within 5 calendar days of the initial meeting for Owner review and approval.
- C. Contractor shall have access to the various buildings as follows:
MIMS PARK: Monday thru Friday from dawn to dusk - 24/7.

- D. The Contractor may be allowed additional construction days due to inclement conditions ("rain days") only as such are appropriately documented and are in excess of the NOAA/National Weather Service average (previous 5 years) for the given month. A "rain day" is defined as more than a "trace" (0.10") of rain falling within a given 24 hour period. The Contractor shall provide documentation and formally request any "rain days" they feel are legitimately due. Documentation shall be submitted to the Project Manager, in writing, within ten (10) calendar days of the rain event. Claim shall include documentation of trades adversely impacted and the impacted activities of each trade.

20. SITE CONSIDERATIONS:

- A. It is the Contractor's responsibility to carefully remove and store any items not permanently installed within the work areas. We strongly recommend that the Contractor photograph, videotape or in some manner document any features to be removed and their condition, prior to removal.
- B. Noise and strong smells shall be isolated or kept to a minimum when adjacent portions of the site are occupied.
- C. Contractor shall be responsible to leave the work area and adjacent site clear of equipment and debris, etc. at the end of each work day. All final cleaning is the responsibility of the Contractor and shall be executed prior to acceptance for reuse of any portion of the site.
- D. A dumpster and lay down area for Contractor materials and staging may be located at the site and located per the direction of the Owner. The Contractor is responsible for the removal of the dumpster, any storage containers and any

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security fencing, temporary erosion control (BMPs), etc. as soon as practical after their use by the Contractor or the work is complete.

21. SALES AND USE TAX EXEMPTION:

- A. As per the State of Alabama ACT 2013-205, the Alabama Department of Revenue (ADOR) has been granted the authority to issue a "Certificate of Exemption from Sales and Use Tax for Governmental Entities" on construction projects. Therefore, this project shall qualify for State of Alabama Sales and Use Tax Exemptions under this ACT. It is the responsibility of the Bidder to confirm the potential tax exempt status of their bid with the ADOR and include any such savings in their bid, as well as accounting for same on their bid form attachment Sales Tax Form C-3A.
- B. The full text of ACT 2013-205 is available on the State of Alabama Building Commission web-site at www.bc.alabama.gov.

22. SUBMISSION OF LIEN WAIVERS AND DBE COMPLIANCE, UTILIZATION REPORTS:

- A. At each monthly Application for Payment submitted to the owner, the Contractor shall provide completed "City of Mobile DBE Compliance, Utilization Reports" and lien waivers, including those from Subcontractors and material suppliers.

23. NOTICE OF COMPLETION:

- A. For Contracts \$50,000 or greater:
Contractor shall provide proof of publication of Advertisement of Completion for four consecutive weeks in a local newspaper, as required in the Title 39, Section 39-1-1, Subsection (f), of the Code of Alabama. This Advertisement shall not begin until the Project has been accepted by the City of Mobile.
- B. Notice of Completion advertisement shall read as follows:

STATE OF ALABAMA

COUNTY OF MOBILE

NOTICE OF COMPLETION

In accordance with Chapter 1, Title 39, Code of Alabama, 1975, NOTICE IS HEREBY given that (COMPANY NAME) has completed the contract for City of Mobile, Alabama, Mims Park – Restroom / Concession - PR-039-22, Mobile, Alabama 36602. All persons having any claims for labor, material or otherwise in connection with this project should immediately notify the Architectural Engineering Department, City of Mobile, P.O. Box 1827, Mobile, Alabama 36633-1827.

- C. Advertisement shall not begin until the Project has been accepted by the City of Mobile as Substantially Complete.

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24. CONTRACTOR WARRANTY AND CERTIFICATION:

- A. Upon completion of the contract, the Contractor shall certify under oath that all bills have been paid in full.
- B. Contractor shall provide a one year Labor and Materials Warranty on company letterhead in addition to other warranties required by the Bid Documents.

25. LIQUIDATED DAMAGES

- A. A time charge equal to Two Hundred Fifty Dollars (\$250.00) per calendar day will be made against the Contractor for the entire period that any part of the Work remains uncompleted, or any required closeout documents are not acceptably submitted, for more than thirty (30) calendar days after the time specified for the Substantial Completion for the Work, the amount of which shall be deducted by the owner, and shall be retained by the Owner out of monies otherwise due the Contractor in the final payment, not as a penalty, but as liquidated damages sustained.

END OF SECTION

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SECTION 00400

BID FORM

Copies of the following Bid Forms shall be used. Bids submitted on alternate forms may be rejected. Fill in all blank spaces with an appropriate entry. Bid Form must be signed by an officer of the company and notarized.

TO: City of Mobile, 205 Government St., P.O. Box 1827, Mobile, AL, 36633

REF: PROJECT NO.: PR-048-24B
PROJECT NAME: Mims Park –Restroom / Concession
PROJECT LOCATION: 5400 Grishilde Drive
Mobile, Alabama, 36633

In compliance with the Bid Documents and having carefully and thoroughly examined said documents for the subject Work prepared by the City of Mobile, Architectural Engineering Department and CPLA Design + Planning Dated October 16, 2024; and all Addendum (a) Number(s) _____, dated _____, 2024 (CAUTION: before submitting any bid it is the Bidder's responsibility to check with the Architectural Engineering Department for all Addenda or special instructions that may impact the Bid) thereto, receipt of which is hereby acknowledged, the premises and all conditions affecting the Work prior to making this Proposal, the Undersigned Bidder, hereby

COMPANY NAME: _____

ADDRESS: _____ **PHONE** _____

ALABAMA GENERAL CONTRACTOR LICENSE NO. _____

CITY OF MOBILE BUSINESS LICENSE NO. _____

SECRETARY OF STATE OF ALABAMA BUSINESS IDENTITY NO. _____

SECRETARY OF STATE OF ALABAMA ACCOUNT NO. _____

(Note: Secretary of State Account Number shall be filled in only by non-resident bidders)

(Check one) A Corporation A Partnership An Individual Doing Business

hereby proposes to furnish all labor, materials, tools, equipment, and supplies and to sustain all the expenses incurred in performing the Work on the above captioned Project in accordance with the terms of the Contract Documents, and all applicable laws and regulations for the sum listed below. The initial term of the Contract shall extend for sixty (60) calendar days from the date of the Notice to Proceed.

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Base Bid: \$.00

Contingency Allowance: + \$ 50,000.00

Total Base Bid: \$.00
(Fill in here and in Total Bid below)

TOTAL BASE BID: _____

_____ Dollars, (\$.00)
(Amount in Words) (Amount in Figures)

Additive Alternate #1: ADA walkway and parking update.

_____ Dollars & No Cents \$.00
Amount in Words Amount in #'s

Additive Alternate #2: Resinous Flooring instead of sealed concrete floors.

_____ Dollars & No Cents \$.00
Amount in Words Amount in #'s

Additive Alternate #3: FRP Wall Cover instead of Gypsum Walls (toilets).

_____ Dollars & No Cents \$.00
Amount in Words Amount in #'s

Additive Alternate #4: Burnished Faced Block instead of Stained CMU Block.

_____ Dollars & No Cents \$.00
Amount in Words Amount in #'s

Additive Alternate #5: FRP exterior doors.

_____ Dollars & No Cents \$.00
Amount in Words Amount in #'s

(Note: Show amount in both words and figures. In case of discrepancy, the amount in words shall govern). **Bids shall be provided in whole dollar amount with no cents.**

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CONTINGENCY ALLOWANCE: \$50,000.00 lump sum Contingency Allowance shall be included in the Total Bid for work related to unforeseen conditions as approved by the Owner.

BID SECURITY: The undersigned Bidder agrees that the attached Bid Security, as a Cashier's Check drawn on a bank registered to do business in the State of Alabama and which is a member of the Federal Deposit Insurance Corporation, or a Bid Bond, made payable to the City of Mobile, in the amount of 5% of the bid amount, but in no event more than \$10,000, as the proper measure of liquidated damages which the City will sustain by the failure of the undersigned to execute the Contract. Said Bid Security shall become the property of the City of Mobile as liquidated damages as specified in the Contract Documents.

AMERICANS WITH DISABILITIES ACT (ADA): The undersigned Bidder agrees to fully comply with all requirements of the Americans with Disabilities Act of 1990 and the Amendment Act.

NONDISCRIMINATION: Contractor shall comply with all Federal, State and local laws concerning nondiscrimination, including but not limited to City of Mobile Ordinance No. 14-034 which requires, *inter alia*, that all contractors performing work for the City of Mobile not discriminate on the basis of race, creed, color, national origin or disability, require that all subcontractors they engage do the same, and make every reasonable effort to assure that fifteen percent of the work performed under contract be awarded to socially and economically disadvantaged individuals and business entities.

SIGNATURE: If the undersigned Bidder is incorporated, the entire legal title of the company followed by "a corporation" should be used. If Bidder is an individual, then that individual's full legal name followed by doing business as (d/b/a) and name of firm, if any, should be used. If Bidder is a partnership, then full name of each partner should be listed followed by "d/b/a" and name of firm, if any.

Ensure that name and exact arrangement thereof is the same on all forms submitted with this Bid. If a word is abbreviated in the official company name, such as "Co.", then use that abbreviation. If not abbreviated in the official name, spell out.

Bidder agrees not to revoke or withdraw this Bid until sixty (60) calendar days following the time and date for receipt of bids. If notified in writing of the acceptance of this Bid within this time period, Bidder agrees to execute a Contract based on this Bid on the proscribed form within ten (10) calendar days of said notification and to furnish Performance Bond and Materials and Payment Bond as specified.

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COMPANY NAME: _____
(Printed or Typed)

BY: _____
(Signature of Company Officer)

COMPANY OFFICER: _____
(Printed or Typed)

TITLE _____ **DATE** _____, 2021
(Printed or Typed)

Sworn to and subscribed before me this _____ day of _____ 2021

Notary Public

- Attachments: 1. Bid Security, with Power of Attorney
2. Secretary of State Authorization (Out of state bidders only)
3. Sales Tax Form C-3A
4. Supplier Diversity Subcontracting & Major Supplier Plan

END OF BID FORM

**ACCOUNTING OF SALES TAX
ATTACHMENT TO BID FORM SECTION 00400
SALES TAX FORM C-3A**

To: City of Mobile

Date: _____

Name of Project: Mims Park Restroom/Concession
Project Number: PR-048-24B

SALES TAX ACCOUNTING

Pursuant to Act 2013-205, Section 1(g) the Contractor accounts for the sales tax NOT included in the bid proposal form as follows:

ESTIMATED SALES TAX AMOUNT

<u>OPTION ONE BASE BID:</u>	\$ _____
<u>ADD ALT. #1:</u>	\$ _____
<u>ADD ALT. #2:</u>	\$ _____
<u>ADD ALT. #3:</u>	\$ _____
<u>ADD ALT. #4:</u>	\$ _____
<u>ADD ALT. #5:</u>	\$ _____

Failure to provide an accounting of sales tax shall render the bid non-responsive. Other than determining responsiveness, sales tax accounting shall not affect the bid pricing nor be considered in the determination of the lowest responsible and responsive bidder.

Legal Name of Bidder _____

Mailing Address _____

***By (Legal Signature)** _____

*Name (type or print) _____ (Seal)

*Title _____

Telephone Number _____

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SECTION 00500

STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

PART 1 GENERAL

- A. This section includes the STANDARD FORM OF AGREEMENT BETWEEN OWNER and CONTRACTOR, AIA Document A101, wherein the basis of payment is a Stipulated Sum; the document has been electronically modified to meet the Owner's requirements and shall be used for the Project.

SECTION 00600

BONDS, CERTIFICATES AND AFFIDAVITS

PART 1 GENERAL

This section includes the Bond Forms and Certificates that are to be used on this Project. No other forms will be accepted. Forms may be obtained from the Architectural Engineering Department, City of Mobile, telephone number 251-208-7454.

1.1 FORMS

- A. PERFORMANCE BOND. Owner's modified Performance Bond form.
- B. LABOR AND MATERIAL PAYMENT BOND. Owner's modified Payment Bond form.
- C. E-Verify Documentation (Sample)
- D. APPLICATION AND CERTIFICATION FOR PAYMENT - AIA Document G702 and AIA Document G703 and DBE Utilization Report
- E. CERTIFICATE of SUBSTANTIAL COMPLETION – AIA Document G704-2017
- F. CONTRACTOR'S AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS - AIA Document G706
- G. CONTRACTOR'S AFFIDAVIT OF RELEASE OF LIENS - AIA Document G706A.
- H. CONSENT OF SURETY TO FINAL PAYMENT - AIA Document G707
- I. Request for Taxpayer Identification Number and Certification, W-9 Form, and City of Mobile Vendor Information Form

PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner or other Party shall be considered plural where applicable.

KNOW ALL MEN BY THESE PRESENTS: That the Contractor, _____, _____, hereinafter called the Principal, and _____, hereinafter called the Surety, are held and firmly bound unto the **City of Mobile, P. O. Box 1827, Mobile, AL 36633**, hereinafter called the Owner, in the penal sum of _____ and xx/100 Dollars (\$_____.00) for payment of which we bind ourselves, our heirs, executors, administrators, successors, and assigns for the faithful performance of a certain written Contract dated the ____ day of _____, 2021 entered into between the Principal and the City of Mobile for furnishing all labor, material, equipment and insurance and performing all Work required to properly complete City of Mobile, Mims Park –Restroom / Concession (PR-039-22) 5400 Grishilde Drive, Mobile, Alabama, a copy of which said Contract is incorporated herein by reference and is made a part hereof as if fully copied herein.

NOW, THEREFORE, the condition of this obligation is such that if the Principal shall faithfully perform the terms and conditions of the Contract in all respects on its part and shall fully pay all obligations incurred in connection with the performance of such Contract on account of labor and materials used in connection therewith, and all such other obligations of every form, nature and character, and shall save harmless the Owner from all and any liability of every nature, kind and character which may be incurred in connection with the performance or fulfillment of such Contract or other such and liability resulting from negligence or otherwise on the part of such Principal and further save harmless the Owner from all cost and damage which may be suffered by reason of the failure to fully and completely perform said contract and shall fully reimburse and repay the Owner for all expenditures of every kind, character, and description which may be incurred by the Owner in making good any and every default which may exist on the part of the Principal in connection with the performance of said Contract; and further that the Principal shall pay all lawful claims of all persons, firms, partnerships, or corporations for all labor performed and material furnished in connection with the performance of the Contract, and that the failure to do so with such persons, firms, partnerships or corporations shall give them a direct obligation; and provided, however, that no suit, action, or proceedings by reason of any default whatever shall be brought on this bond after two years from the date on which the final payment on the Contract falls due, and provided, further, that if any alterations or additions which may be made under the Contract, or in the work to be done under it, or the giving by the Owner of any extensions of time for the performance of the Contract or any other forbearance being expressly waived. This obligation shall remain in full force and effect until the performance of all covenants, terms and conditions herein stipulated and after such performance, it shall become null and void.

In addition to any other legal mode of service, service of summons, and other process in civil actions brought in Mobile County may be had on the Contractor or the Surety on the bond by leaving a copy of the summons and complaint or other pleading or process with the Mayor of the City of Mobile which shall bind the principal Contractor and Surety to the mode of service above described and that the service shall be the same as personal service on the contractor or surety. This Bond is given pursuant to the terms of Alabama Code, Title 39-1-1, et. al., As Amended.

EXECUTED IN FOUR (4) COUNTERPARTS.

SIGNED, SEALED AND DELIVERED this ____ day of _____, 2024.

CONTRACTOR AS PRINCIPAL

Company: _____
(Corporate Seal)

By: _____
(Signature)

Name and Title: _____

SURETY

Company: _____
(Corporate Seal)

By: _____
(Signature)

Name and Title: _____

Resident Agent: _____
(Signature)

Name and Title: _____
Company Name: _____
Address: _____
Phone and Fax: _____

Owner's Representative: Shannon McIntyre
Capital Improvement Mgr.
PO Box 1827
Mobile, AL 36633
251-508-7752

LABOR AND MATERIAL PAYMENT BOND

Any singular reference to Contractor, Surety, Owner or other Party shall be considered plural where applicable.

KNOW ALL MEN BY THESE PRESENTS: That the Contractor, _____, _____, _____, as Principal, and _____, _____, _____, as Surety, are held and firmly bound unto the **City of Mobile, P. O. Box 1827, Mobile, AL 36633** (hereinafter called the "Obligee") in the penal sum of _____ and xx/100 (\$ _____ .00) lawful money of the United States, for the payment of which sum well and truly to be made we bind ourselves, our heirs, personal representatives, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, said Principal has entered into a certain Contract with said Obligee, dated the ____ day of _____, 2021 (hereinafter called the "Contract") for furnishing all labor, material, equipment and insurance and perform all work required to properly complete City of Mobile, Mims Park –Restroom / Concession (PR-039-22) 5400 Grishilde Drive Mobile, Alabama, which, **THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH** that if said Principal and all subcontractors to whom any portion of work provided for in said Contract is sublet and all assignees of said Principal and of such subcontractors shall promptly make payments to all persons supplying him or them with labor, materials or supplies for or in the prosecution of the work provided for in such Contract, or in any amendment or extension of or additions to said Contract, and for the payment of reasonable attorney's fees, incurred by the claimant or claimants in suits on each bond, then the above obligations shall be void; otherwise to remain in full force and effect. **PROVIDED**, however, that this bond is subject to the following conditions and limitations.

- (a) Any person, firm or corporation that has furnished labor, materials or supplies for or in the prosecution of the work provided for in said contract shall have a direct right of action against the Principal and Surety on this bond, which right of action shall be asserted in a proceeding instituted in the County in which the work provided for in said Contract is to be performed or in any county in which said Principal and Surety does business. Such right of action shall be asserted in a proceeding instituted in the name of the claimant or claimants for his or their use and benefit against said Principal and Surety or either of them (but not later than one year after the final settlement of said Contract) in which action such claim or claims shall be adjudicated and judgment rendered thereon.
- (b) The Principal and Surety hereby designate and appoint _____ **Attorney-In-Fact**, as the agent of each of them to receive and accept service of process or other pleading issued or filed in any proceeding instituted on this bond and hereby consent that such service shall be the same as personal service on the Principal and/or Surety. In addition to any other legal mode of service, service of summons, and other process in civil actions brought in Mobile County may be had on the Contractor or the Surety on the bond by leaving a copy of the summons and complaint or other pleading or process with the Mayor of the City of Mobile which shall bind the principal Contractor and Surety to the mode of service above described and that the service shall be the same as personal service on the contractor or surety.
- (c) The Surety shall not be liable hereunder for damage or compensation recoverable under any Workmen's Compensation or Employer's Liability Statute.
- (d) In no event shall the Surety be liable for a greater sum than the penalty of this bond, or subject to any suit, action or proceeding thereon that is instituted later than two years after the final settlement of said Contract.
- (e) This bond is given pursuant to the terms of Alabama Code, Title 39-1-1, et. al., As Amended.

EXECUTED IN FOUR (4) COUNTERPARTS.

SIGNED, SEALED AND DELIVERED this ____ day of _____, 2024

CONTRACTOR AS PRINCIPAL
Company: _____
(Corporate Seal)

SURETY
Company: _____
(Corporate Seal)

By: _____
(Signature)

By: _____
(Signature)

Name and Title: _____

Name and Title: _____

Resident Agent: _____
(Signature)

Owner's Representative: Shannon McIntyre
Capital Improvement Mgr.
PO Box 1827
Mobile, AL 36633
251-508-7752

Name and Title: _____

Company Name: _____

Address: _____

Phone and Fax: _____

DIVISION 1 GENERAL REQUIREMENTS

SECTION 01 010 – SUMMARY OF THE WORK

PART 1 - GENERAL

1.1 PROJECT INFORMATION

- A. Project Identification: Mims Park – Restrooms/Concession
 - 1. Project Location: Mobile, AL.
- B. Owner: City of Mobile
 - 1. Owner's Representative: Will Mastin
- C. Landscape Architect: CPLA, PLLC; 307 De La Mare, Fairhope, AL; 855-539-5086
 - 1. Landscape Architecture Representative: Christian Preus

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Work Covered: Work covered by the Contract Documents is as shown in drawings and described in words in the Project Manual.
- B. Start of Work: Work shall be started immediately upon issuance of a *Notice to Proceed*. Prior to this, all Contracts and beginning documents will have been executed and insurance in force.
- C. Time of Completion: The completion of this Work is to be on, or before, the time indicated in the *Standard Form of Agreement Between the Owner and the Contractor*.
- D. Contractor's Duties:
 - 1. Except as specifically noted, provide and pay for:
 - a. Labor, materials and equipment.
 - b. Tools, construction equipment and machinery.
 - c. Water, heat and utilities required for construction.
 - d. Other facilities and services necessary for proper execution and completion of the Work.
 - 2. Pay legally required sales, consumer, use, payroll, privilege and other taxes.
 - 3. Secure and pay for, as necessary for proper execution and completion of work, and as applicable at the time of the receipt of the bids:
 - a. Permits.
 - b. Government fees.
 - c. Licenses.
 - 4. Give required notices.
 - 5. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of work.
 - 6. Promptly submit written notice to Professional of observed variance of Contract Documents from legal requirements. It is not the Contractor's responsibility to make certain that drawings and specifications comply with codes and regulations. Appropriate modifications to Contract Documents will adjust necessary changes. Assume responsibility for work known to be contrary to such requirements, without notice.

7. Enforce strict discipline and good order among employees. Do not employ or work unfit persons, or persons, not skilled in assigned task.
 8. Provide a written safety plan.
- E. Hazardous Materials: The Prime General Contractor is responsible for the removal and disposal of any hazardous materials encountered in the performance of the Contract requirements. Hazardous Containing Materials [HCM] include, but are not limited to, Asbestos and Lead Paint and should be identified and removed as a part of the Contract. The absence of details does not relieve the Prime General Contractor from the responsibility of removal and disposal; but, a Change Order could be executed in the absence of identified HCM in the documents.
- F. Subcontractor's List: The Prime General Contractor will submit to the Owner a list of all Subcontractors to be used on the Project within seven (7) days after written notice of contract award by the Owner. Any Subcontractor listed must be acceptable to the Owner.
- G. Coordination: The Prime General Contractor is responsible for the coordination of the total project. All other Prime Contractors and all Subcontractors will cooperate with the Prime General Contractor so as to facilitate the general progress of the Work. Each trade shall afford all other trades every reasonable opportunity for the installation of their work. Refer to Section 01041 entitled *Project Coordination*.
- 1.3 WORK BY OTHERS
- A. Work by Others shall be described in each appropriate Project Manual section and noted on the Drawings.
- 1.4 WORK BY OWNER
- A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.
- B. Concurrent Work: NA
- 1.5 WORK UNDER SEPARATE CONTRACTS
- A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.
- B. Preceding Work: Owner has awarded separate contract(s) for the following construction operations at Project site. Those operations are scheduled to be substantially complete before work under this Contract begins.
1. NA
- 1.6 OWNER-FURNISHED PRODUCTS
- A. Products Furnished By Owner: Products furnished by Owner shall be described in each appropriate Project Manual section and noted on the Drawings.

- B. Products: Delivered and unloaded at site.
- C. Owner's Duties:
 - 1. Schedule delivery date with Supplier in accordance with construction schedule.
 - 2. Obtain installation drawings and instructions.
 - 3. Submit claims for transportation damages.
 - 4. Arrange Guarantees, Warranties, etc..
- D. Contractor's Duties:
 - 1. Designate required delivery date for each product in construction schedule.
 - 2. Promptly inspect delivered products, report missing, damaged, or defective items.
 - 3. Handle at site, including uncrating and storage.
 - 4. Protect from exposure to elements and from damage.
 - 5. Repair or replace damaged items resulting from Contractor's operations.
 - 6. Install and make final connections.

1.7 CONTRACTOR'S USE OF PREMISES

- A. Work Restrictions, Work Hours: Construction work hours are dawn to dusk.
- B.
 - 1. Law.
 - 2. Ordinances.
 - 3. Permits.
 - 4. Contract Documents.
 - 5. Owner.
- C. Do not unreasonably encumber site with materials or equipment.
- D. Do not load structure with weight that will endanger structure.
- E. Assume full responsibility for protection and safekeeping of products stored on premises.
- F. Move any stored products which interfere with operations of Owner or other Contractors.
- G. Obtain and pay for use of additional storage or work areas needed for operations.
- H. Limit use of site for work and storage to the area indicated in the drawings.

1.8 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. 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 published as part of the U.S. National CAD Standard and scheduled on Drawings.
 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

***** End of Section *****

SECTION 01 045 – CUTTING AND PATCHING

PART 1 - GENERAL

1.1 GENERAL DESCRIPTION

- A. Scope: To set forth broad, general conditions covering cutting and patching that applies to everyone and everything on the job.
- B. Execute cutting including excavating, fitting, or patching of work required to:
 - 1. Make several parts fit properly.
 - 2. Uncover work to provide for installation of ill-timed work.
 - 3. Remove and replace defective work.
 - 4. Remove and replace work not conforming to Contract requirements.
 - 5. Install specified work in existing construction.
- C. In addition to Contract requirements, upon Professional's written instructions:
 - 1. Uncover work for observation of covered work.
 - 2. Remove samples of installed materials for testing.
 - 3. Remove work to provide alteration of existing work.
- D. Do not cut or alter work of another Contractor without permission.
- E. Payment of Costs: Costs caused by ill-timed, or defective work, or work not conforming to Contract Documents will be borne by party responsible for ill-timed, defective work, or non-conforming work.

1.2 MATERIALS/PRODUCTS

- A. Materials for Replacement or Work Removed: Comply with Specifications for type of work to be accomplished.

1.3 EXECUTION

- A. Inspection: Inspect existing conditions of work, including elements subject to movement, or damage during cutting and patching.
- B. Preparation Prior to Cutting: Provide shoring, bracing and support, as required, to maintain structural integrity of the building. Provide protection for other portions of work and protection from the elements.
- C. Performance:
 - 1. Execute cutting and demolition by methods which prevent damage to other work and will provide surfaces to receive installation of repairs and new work.
 - 2. Execute excavating and backfilling by methods which prevent damage to other work and prevent settlement.
 - 3. Restore work which has been cut or removed; install new products to provide completed work in accordance with requirements of Contract Documents.
 - 4. Refinish entire surfaces, as necessary, to provide an even finish. Refinish continuous surfaces to the nearest intersection and assemblies entirely.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

***** End of Section *****

SECTION 011200 - MULTIPLE CONTRACT SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes a summary of each contract, including responsibilities for coordination and temporary facilities and controls.
- B. Specific requirements for Work of each contract are also indicated in individual Specification Sections and on Drawings.

1.3 COORDINATION ACTIVITIES

- A. Coordination activities of Project coordinator include, but are not limited to, the following:
 - 1. Provide overall coordination of the Work.
 - 2. Coordinate shared access to workspaces.
 - 3. Coordinate product selections for compatibility.
 - 4. Provide overall coordination of temporary facilities and controls.
 - 5. Coordinate, schedule, and approve interruptions of permanent and temporary utilities, including those necessary to make connections for temporary services.
 - 6. Coordinate construction and operations of the Work with work performed by each Contract if applicable.
 - 7. Prepare coordination drawings in collaboration with each contractor to coordinate work by more than one contract.
 - 8. Coordinate sequencing and scheduling of the Work. Include the following:
 - a. Initial Coordination Meeting: At earliest possible date, arrange and conduct a meeting with contractors for sequencing and coordinating the Work; negotiate reasonable adjustments to schedules.
 - b. Prepare a combined contractors' construction schedule for entire Project. Base schedule on preliminary construction schedule. Secure time commitments for performing critical construction activities from contractors. Show activities of each contract on a separate sheet. Prepare a simplified summary sheet indicating combined construction activities of contracts.
 - 1) Submit schedules for approval.
 - 2) Distribute copies of approved schedules to contractors.
 - 9. Provide photographic documentation.
 - 10. Provide quality-assurance and quality-control services specified in Section 014000 "Quality Requirements."
 - 11. Coordinate sequence of activities to accommodate tests and inspections, and coordinate schedule of tests and inspections.

12. Provide information necessary to adjust, move, or relocate existing utility structures affected by construction.
13. Locate existing permanent benchmarks, control points, and similar reference points, and establish permanent benchmarks on Project site.
14. Provide field surveys of in-progress construction and site work.
15. Provide progress cleaning of common areas and coordinate progress cleaning of areas or pieces of equipment where more than one contractor has worked.
16. Coordinate cutting and patching.
17. Coordinate protection of the Work.
18. Coordinate firestopping.
19. Coordinate completion of interrelated punch list items.
20. Coordinate preparation of Project record documents if information from more than one contractor is to be integrated with information from other contractors to form one combined record.
21. Print and submit record documents if installations by more than one contractor are indicated on the same contract drawing or shop drawing.
22. Collect record Specification Sections from contractors, collate Sections into numeric order, and submit complete set.
23. Coordinate preparation of operation and maintenance manuals if information from more than one contractor is to be integrated with information from other contractors to form one combined record.

B. Responsibilities of Project coordinator for temporary facilities and controls include, but are not limited to, the following:

1. Provide common-use field office for use by all personnel engaged in construction activities.
2. Provide telephone service for common-use facilities.

C. Mechanical/Electrical Coordinator: Coordination activities of mechanical/electrical coordinator include, but are not limited to, the following:

1. Schedule and sequence mechanical and electrical activities.
2. Coordinate sharing access to workspaces by mechanical and electrical contractors.
3. Coordinate integration of mechanical and electrical work into limited spaces.
4. Coordinate protection of mechanical and electrical contractors' work.
5. Coordinate cutting and patching for mechanical and electrical work.
6. Prepare mechanical and electrical coordination drawings.
7. Coordinate tests and inspections for mechanical and electrical work.
8. Coordinate mechanical and electrical temporary services and facilities.

1.4 GENERAL REQUIREMENTS OF CONTRACTS

A. Extent of Contract: Unless the Agreement contains a more specific description of the Work of each Contract, requirements indicated on Drawings and in Specification Sections determine which contract includes a specific element of Project.

1. Unless otherwise indicated, the work described in this Section for each contract shall be complete systems and assemblies, including products, components, accessories, and installation required by the Contract Documents.
2. Trenches and other excavation for the work of each contract shall be the work of **the General Construction Contract**
3. Blocking, backing panels, sleeves, and metal fabrication supports for the work of each contract shall be the work of the General Construction Contract.

4. Furnishing of access panels for the work of each contract shall be the work of each contract for its own work. Installation of access panels shall be the work of the General Construction Contract
 5. Equipment pads for the work of each contract shall be the work of the General Construction Contract.
 6. Roof-mounted equipment curbs for the work of each contract shall be the work of the General Construction Contract.
 7. Painting for the work of each contract shall be the work of the General Construction Contract.
 8. Through-penetration firestopping for the work of each contract shall be provided by the General Construction Contract.
 9. Contractors' Startup Construction Schedule: Within 5 working days after startup horizontal bar-chart-type construction schedule submittal has been received from Project coordinator, submit a matching startup horizontal bar-chart schedule showing construction operations sequenced and coordinated with overall construction.
- B. Temporary Facilities and Controls: In addition to specific responsibilities for temporary facilities and controls indicated in this Section and in Section 015000 "Temporary Facilities and Controls," each contractor is responsible for the following:
1. Installation, operation, maintenance, and removal of each temporary facility necessary for its own normal construction activity, and costs and use charges associated with each facility, except as otherwise provided for in this Section.
 2. Plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting necessary exclusively for its own activities.
 3. Its own field office, complete with necessary furniture, utilities, and telephone service.
 4. Its own storage and fabrication sheds.
 5. Temporary enclosures for its own construction activities.
 6. Staging and scaffolding for its own construction activities.
 7. General hoisting facilities for its own construction activities, up to 2 tons (2000 kg).
 8. Waste disposal facilities, including collection and legal disposal of its own hazardous, dangerous, unsanitary, or other harmful waste materials.
 9. Progress cleaning of work areas affected by its operations on a daily basis.
 10. Secure lockup of its own tools, materials, and equipment.
 11. Construction aids and miscellaneous services and facilities necessary exclusively for its own construction activities.

1.5 GENERAL CONSTRUCTION CONTRACT

- A. Work in the General Construction Contract includes, but is not limited to, the following:
1. Remaining work not identified as work under other contracts.
 2. Site preparation, including clearing, building demolition and relocations, and earthwork.
 3. Site improvements, including roadways, parking lots, pedestrian paving, site development furnishings and equipment, and landscaping.
 4. Tunnels for site utilities.
 5. Selective demolition.
 6. Foundations, including footings, foundation walls.
 7. Slabs-on-grade, including earthwork, subdrainage systems, and insulation.
 8. Below-grade building construction, including excavation, backfill, and thermal and moisture protection.
 9. Exterior closure, including walls, doors, windows, and louvers.
 10. Roofing, including coverings, flashings and glazed openings.
 11. Interior construction, including partitions, doors, interior glazed openings, and fittings.
 12. Fire-protection specialties.

13. Stairs, including railings and finishes.
14. Interior finishes.
15. Special construction, including the following:
 - a. Preengineered structures.
 - b. Special-purpose rooms.
 - c. Radiation protection.

- B. Temporary facilities and controls in the General Construction Contract include, but are not limited to, the following:
1. Sediment and erosion control.
 2. Unpiped sewers and drainage, including drainage ditches, dry wells, stabilization ponds, and containers.
 3. Stormwater control.
 4. Unpiped temporary toilet fixtures, wash facilities, and drinking water facilities, including disposable supplies.
 5. Temporary enclosure for building exterior, except as indicated.
 6. Temporary roads and paved areas.
 7. Dewatering facilities and drains.
 8. Excavation support and protection, unless required solely for the Work of another contract.
 9. Special or unusual hoisting requirements for construction activities, including hoisting loads in excess of 2 tons (2000 kg), hoisting material or equipment into spaces below grade, and hoisting requirements outside building enclosure.
 10. Project identification and temporary signs.
 11. General waste disposal facilities.
 12. Pest control.
 13. Temporary stairs.
 14. Temporary fire-protection facilities.
 15. Barricades, warning signs, and lights.
 16. Site enclosure fence.
 17. Covered walkways.
 18. Security enclosure and lockup.
 19. Environmental protection.
 20. Restoration of Owner's existing facilities used as temporary facilities.

1.6 PLUMBING CONTRACT

- A. Work in the Plumbing Contract includes, but is not limited to, the following:
1. Site water supply and distribution.
 2. Site sanitary sewerage.
 3. Site storm drainage.
 4. Site fuel distribution.
 5. Site special plumbing systems.
 6. Plumbing fixtures.
 7. Domestic water distribution.
 8. Sanitary waste.
 9. Stormwater drainage.
 10. Special plumbing systems, including the following:
 - a. Compressed air.
 - b. Deionized water.
 - c. Distilled water.
 - d. Fuel oil.

- e. Natural gas.
 - f. Medical gas.
 - g. Vacuum.
 - h. Acid waste.
 - i. Pools and fountains.
11. Fire-suppression systems.
 12. Special fire-suppression systems, including the following:
 - a. Foam fire-extinguishing systems.
 - b. Clean-agent extinguishing systems.
- B. Temporary facilities and controls in the Plumbing Contract include, but are not limited to, the following:
1. Piped sewerage and drainage.
 2. Piped gas service.
 3. Piped water service.
 4. Piped temporary toilet fixtures, wash facilities, and drinking water facilities.
- 1.7 HVAC CONTRACT
- A. Work in the HVAC Contract includes, but is not limited to, the following:
1. Site steam distribution.
 2. Site hydronic distribution.
 3. HVAC systems and equipment.
 4. HVAC instrumentation and controls.
 5. HVAC testing, adjusting, and balancing.
 6. Building automation system.
- 1.8 ELECTRICAL CONTRACT
- A. Work in the Electrical Contract includes, but is not limited to, the following:
1. Site electrical distribution.
 2. Site lighting.
 3. Site communications and security.
 4. Electrical service and distribution.
 5. Exterior and interior lighting.
 6. Communication and security.
 7. Special electrical systems, including the following:
 - a. Uninterruptible power supply systems.
 - b. Packaged engine generator systems.
 - c. Battery power systems.
 - d. Cathodic protection.
 - e. Electromagnetic shielding systems.
 - f. Lightning protection systems.
 - g. Unit power conditioners.
 - h. Power generation systems.
 8. \

- B. Temporary facilities and controls in the Electrical Contract include, but are not limited to, the following:
1. Electric power service and distribution.
 2. Lighting, including site lighting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011200

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
 - 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and 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.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
- C. Related Requirements:
 - 1. Section 014000 "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.

1.3 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Landscape 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 Landscape Architect from the designated supplier.

1.4 ACTION SUBMITTALS

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

1.5 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.

1.6 COORDINATION

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

1.7 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 selected by Landscape 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. If requested by Landscape Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 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 margins claimed.
- 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)

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

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

END OF SECTION 012100

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Requirements:
 - 1. Owner supplied Change Order Forms must be used.

1.3 DEFINITIONS

- A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

Insert unit pricing

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of 90 calendar days after the scheduled closing time for receiving bids.

Upon receipt of written notice of the acceptance of this bid, bidder will execute the formal contract within 10 days and deliver a Surety Bond or Bonds as required by the General Conditions. The bid security attached in the sum of:

- _____ (\$ _____)

is to become the property of the Owner in the event the contract and bond are not executed within the time above set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby. In the event of the failure of the successful Bidder to enter into the contract within the time period specified, the Owner has the right to rescind the award and award the contract to the next lowest, responsible, responsive bidder.

Respectfully submitted:

(SEAL- if bid is by corporation) Name of Company: _____

BY: _____

Title: _____

Address:

Street: _____

P.O. Box: _____

City/State/Zip: _____

Telephone: _____

Certificate of Responsibility Number: _____

END OF SECTION 012200

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

Additive Alternate #1: ADA walkway and parking update

Additive Alternate #2: Resinous Flooring instead of sealed concrete floors.

Additive Alternate #3: FRP Wall Cover instead of Gypsum Walls (toilets).

Additive Alternate #4: FRP Wall Cover instead of Gypsum Walls (toilets).

Additive Alternate #5: FRP Exterior Doors

END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 012300 "Alternates" for products selected under an alternate.
 - 2. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions 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 appropriate sources.
 - 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.
2. Landscape Architect's Action: If necessary, Landscape Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Landscape Architect will notify Contractor of acceptance or rejection of proposed substitution within fifteen 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.

1.4 QUALITY ASSURANCE

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

1.5 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than fifteen 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. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.
 - h. 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: Not allowed.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 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. Requests for Information (RFIs).
 - 4. Project Web site.
 - 5. Project meetings.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.2 DEFINITIONS

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

1.3 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, and telephone number 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.

1.4 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.

1.5 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown 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. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - b. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate 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. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
 3. 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.
 4. Review: Architect will review coordination drawings to confirm that 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 changes as directed and resubmit.
- 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 same format as file preparation 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.

1.6 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 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 Landscape 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: AIA Document G716
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow 10 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 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. Software log with not less than the following:
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect
 4. RFI number including RFIs that were returned without action or withdrawn.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Architect's response was received.
- 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 7 days if Contractor disagrees with response.
1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

1.7 DIGITAL PROJECT MANAGEMENT PROCEDURES

- A. Use of Landscape Architect's Digital Data Files: Digital data files of CAD drawings will be provided by Landscape 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. 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.

1.8 PROJECT MEETINGS

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

- B. Preconstruction Conference: Landscape Architect 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, Landscape 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. Phasing.
 - d. Critical work sequencing and long-lead items.
 - e. Designation of key personnel and their duties.
 - f. Lines of communications.
 - g. Use of web-based Project Software
 - h. Procedures for processing field decisions and Change Orders.
 - i. Procedures for RFIs.
 - j. Procedures for testing and inspecting.
 - k. Procedures for processing Applications for Payment.
 - l. Distribution of the Contract Documents.
 - m. Submittal procedures.
 - n. Preparation of record documents.
 - o. Use of the premises.
 - p. Work restrictions.
 - q. Working hours.
 - r. Owner's occupancy requirements.
 - s. Responsibility for temporary facilities and controls.
 - t. Procedures for moisture and mold control.
 - u. Procedures for disruptions and shutdowns.
 - v. Construction waste management and recycling.
 - w. Parking availability.
 - x. Office, work, and storage areas.
 - y. Equipment deliveries and priorities.
 - z. First aid.
 - aa. Security.
 - bb. Progress cleaning.
 3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
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 Landscape 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. Sustainable design requirements.
 - i. Review of mockups.
 - j. Possible conflicts.
 - k. Compatibility requirements.
 - l. Time schedules.
 - m. Weather limitations.
 - n. Manufacturer's written instructions.
 - o. Warranty requirements.
 - p. Compatibility of materials.
 - q. Acceptability of substrates.
 - r. Temporary facilities and controls.
 - s. Space and access limitations.
 - t. Regulations of authorities having jurisdiction.
 - u. Testing and inspecting requirements.
 - v. Installation procedures.
 - w. Coordination with other work.
 - x. Required performance results.
 - y. Protection of adjacent work.
 - z. 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.
- D. Progress Meetings: Conduct progress meetings at monthly intervals intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner and Landscape 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) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site use.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.
 - 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) 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.

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 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. Construction schedule updating reports.
3. Daily construction reports.
4. Site condition reports.

1.2 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 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. Event: The starting or ending point of an activity.
- E. Float: The measure of leeway in starting and completing an activity.
1. Float time belongs to Owner.
 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

1.3 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
1. Working electronic copy of schedule file, where indicated.
 2. PDF electronic file.

- B. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 - 1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals.
- C. Construction Schedule Updating Reports: Submit with Applications for Payment.
- D. Daily Construction Reports: Submit at monthly intervals.
- E. Site Condition Reports: Submit at time of discovery of differing conditions.

1.4 COORDINATION

- A. 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.

1.5 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.
- B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial 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.
- C. Activities: Treat each story or separate area as a separate numbered activity for each main 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 Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
 - 4. 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.

5. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.
- D. 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 Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Uninterruptible services.
 - c. Use of premises restrictions.
 - d. Provisions for future construction.
- 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 Requests for Information.
 3. Rejected or unreturned submittals.
 4. Notations on returned submittals.
 5. Pending modifications affecting the Work and Contract Time.
- F. 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.
- G. 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. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.
- H. 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

1.6 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's construction schedule within 30 days of date established for commencement of the Work].
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 - 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

1.7 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. 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.
- B. 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. Main 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).
- C. 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.
- D. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
 - 1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
 - 2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
 - 3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
 - 4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.

- a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
- b. Submit value summary printouts [**one week**] <Insert time> before each regularly scheduled progress meeting.

1.8 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. Approximate count of personnel at Project site.
 3. Equipment at Project site.
 4. Material deliveries.
 5. High and low temperatures and general weather conditions, including presence of rain or snow.
 6. Testing and inspection.
 7. Accidents.
 8. Meetings and significant decisions.
 9. Stoppages, delays, shortages, and losses.
 10. Orders and requests of authorities having jurisdiction.
 11. Change Orders received and implemented.
 12. Construction Change Directives received and implemented.
 13. Services connected and disconnected.
 14. Equipment or system tests and startups.
 15. Substantial Completions authorized.
- B. Site Condition Reports: Immediately on discovery of a difference between site 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.

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submittals.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Landscape Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Landscape Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.3 SUBMITTAL SCHEDULE

- 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 revisions to submittals noted by Landscape Architect and additional time for handling and reviewing submittals required by those corrections.

- 1. Format: Arrange the following information in a tabular format:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Name of firm or entity that prepared submittal.
 - f. Name of subcontractor.
 - g. Name of supplier.
 - h. Name of manufacturer.
 - i. Submittal number or other unique identifier, including revision identifier. Include Specification Section number with sequential alphanumeric identifier; and alphanumeric suffix for resubmittals.
 - j. Category and type of submittal.
 - k. Submittal purpose and description
 - l. Number and title of appropriate Specification Section, with paragraph number and generic name for each of the multiple items.
 - m. Drawing number and detail references, as appropriate.
 - n. Indication of full or partial submittal.
 - o. Location(s) where product is to be installed, as appropriate.
 - p. Other necessary identification.
 - q. Remarks.
 - r. Signature of transmitter.

- B. Options: Identify options requiring selection by Landscape Architect.
- C. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Landscape Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- D. PDF Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.
- E. Submittals for web-based project software: Prepare submittals as PDF files, or other format indicated by project software website.

1.4 SUBMITTAL PROCEDURES

- A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Email: prepare submittals as PDF Package, and transmit to Landscape Architect by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Landscape Architect..
- 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. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 - 3. Submit action submittals and informational submittals required by the same Specification.
- 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.
 - 2. Resubmittal Review: Allow 15 days for review of each resubmittal.
- D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
- E. 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.
- F. Use for Construction: Retain Complete Copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Landscape Architect's action stamp.

1.5 SUBMITTAL PROCEDURES

- A. 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 unsuitable 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 that show factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. 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.
- C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.
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. Project name and submittal number
 - b. Generic description of Sample.
 - c. Product name and name of manufacturer.
 - d. Sample source.
 - e. Number and title of applicable Specification Section.
 - f. Specification paragraph number and generic name of each item.
 3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating sample characteristics, and identification information for record.

4. 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.
 5. 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 two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Landscape Architect will return submittal with options selected.
 6. 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.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) 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.
- D. 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. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
 5. Submit product schedule in the following format:
- E. 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.
- F. 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.

G. Certificates:

1. Certificates and Certifications Submittals: Submit 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. Provide a notarized signature where indicated.
2. 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.
3. 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.
4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
6. 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 AWS forms. Include names of firms and personnel certified.

H. Test and Research Reports:

1. 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.
2. Field Test Reports: Submit written 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.
3. 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.
4. 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.
5. Product Test Reports: Submit written reports indicating that 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.
6. 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. Include the following information:
 - a. Name of evaluation organization.
 - b. Date of evaluation.
 - c. Time period when report is in effect.
 - d. Product and manufacturers' names.

- e. Description of product.
- f. Test procedures and results.
- g. Limitations of use.

1.6 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.

PART 2 - EXECUTION

2.1 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 Landscape Architect.
- B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that the submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
 - 1. Architect will not review submittals from Contractor that does not have Contractor's review and approval.

2.2 LANDSCAPE ARCHITECT'S REVIEW

- A. Action Submittals: Landscape Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Landscape Architect will stamp each submittal with an action stamp.
 - 1. PDF Submittals: Landscape Architect will indicate, via markup on each submittal, the appropriate action.
- B. Informational Submittals: Landscape Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Landscape Architect will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Landscape Architect.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Landscape Architect will return without review submittals received from sources other than the Contractor.

- F. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 013300

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
1. Field engineering and surveying.
 2. Installation of the Work.
 3. Cutting and patching.
 4. Progress cleaning.
 5. Starting and adjusting.
 6. Protection of installed construction.

1.2 QUALITY ASSURANCE

- A. 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 elements 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.
- B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 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

3.1 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, 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.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility and owner 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 Section 013100 "Project Management and Coordination."

3.3 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.

3.4 INSTALLATION

- A. **General:** Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 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. Remove and replace damaged, defective, or non-conforming Work.

3.5 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: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
- 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 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.

3.6 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 (27 deg C).
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- 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. Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal.
- 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.

3.7 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 019113 "General Commissioning Requirements."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.8 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 017300

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 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.
 - 5. Repair of the Work.

1.3 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

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

1.5 MAINTENANCE MATERIAL SUBMITTALS

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

1.6 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 14 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, final completion construction photographic documentation, 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 Landscape Architect. Label with manufacturer's name and model number where applicable.
 - 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 Landscape Architect's signature for receipt of submittals.
 5. Submit test/adjust/balance 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 14 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 Section 017900 "Demonstration and Training."
 6. Advise Owner of changeover in heat and other utilities.
 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, including touchup painting.
 10. Touch up 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. Reinspection: 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.

1.7 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, Landscape 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. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 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.
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 Landscape Architect.
 - d. Name of Contractor.
 - e. Page number.
4. Submit list of incomplete items in the following format:
 - a. MS Excel electronic file. Landscape Architect will return annotated file.
 - b. PDF electronic file. Landscape Architect will return annotated file.

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, 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.
 1. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 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.
 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 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 designated 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 neither planted nor 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.
 - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
 - p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - q. Leave Project clean and ready for occupancy.
- C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.

3.2 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 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 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 manuals for systems, subsystems, and equipment.
 - 4. Product maintenance manuals.
 - 5. Systems and equipment maintenance manuals.

1.2 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
 - 1. Submit digital media acceptable to Landscape Architect. Enable review comments on draft submittals.
 - 2. Submit 3 paper copies. Architect will return one copy.
- C. Final 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. Landscape Architect will return copy with comments.
 - 1. Correct or revise each manual to comply with Landscape Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Landscape Architect's comments and prior to commencing demonstration and training.
 - 2. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.3 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

1.4 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 Landscape Architect.
 7. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 8. 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.
- A. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operation and Maintenance Documentation for Building Systems".

1.5 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. Instruction 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.

1.6 SYSTEM AND OPERATION MANUALS

- E. 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 has 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.
- F. 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.

- G. 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.
- H. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- I. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

1.6 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 and drawing or schedule designation or identifier where applicable.
- 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.
1. Include procedures to follow and required notifications for warranty claims.

1.7 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 and drawing or schedule designation or identifier where applicable.
- 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.
 - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- 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.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 2 - EXECUTION

2.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. 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.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. 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.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. 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.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. 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.
 - 2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."
- G. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
1. Record Drawings.
 2. Record Specifications.
 3. Record Product Data.
 4. Miscellaneous record submittals.

1.2 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
1. Number of Copies: Submit 2 set(s) of marked-up record prints.
 2. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit one paper-copy set(s) of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints and one of file prints.
 - 3) Submit record digital data files and one set(s) of plots.
 - 4) Landscape Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit PDF electronic files of scanned record prints and two set(s) of prints.
 - 2) Print each drawing, whether or not changes and additional information were recorded.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
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. Accurately record information in an acceptable drawing technique.

- c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
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. Locations and depths of underground utilities.
 - d. Actual equipment locations.
 - e. Locations of concealed internal utilities.
 - f. Changes made by Change Order or Construction Change Directive.
 - g. Changes made following Architect's written orders.
 - h. Details not on the original Contract Drawings.
 - i. Field records for variable and concealed conditions.
 - j. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use 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. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect **and Construction Manager**. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Annotated PDF electronic file.
 2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 3. Refer instances of uncertainty to Landscape Architect for resolution.
 4. Landscape Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.
 - a. See Section 013300 "Submittal Procedures" for requirements related to use of Landscape Architect's digital data files.
 - b. Landscape Architect will provide data file layer information. Record markups in separate layers.
- C. 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. Format: Annotated PDF electronic file.
 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
 4. Identification: As follows:

- a. Project name.
- b. Date.
- c. Designation "PROJECT RECORD DRAWINGS."
- d. Name of Landscape Architect.
- e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 5. Note related Change Orders, Record Project Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as annotated PDF electronic file

2.3 RECORD PRODUCT DATA

- A. 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, Record Project Data, and record Drawings where applicable.
- B. Format: Submit record Product Data as scanned PDF electronic file(s) of marked-up paper copy of Product Data.
 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. 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 Landscape Architect's reference during normal working hours.

END OF SECTION 017839

GENERAL SPECIFICATIONS

01 40 03 - HOT BITUMINOUS PAVEMENT

PART 1 - SCOPE OF WORK

1.1 SUMMARY

- A. This work shall consist of constructing one or more courses of bituminous pavement on a prepared foundation in accordance with the requirements of these specifications and in reasonably close conformity with the lines, grades, thicknesses, and typical sections shown on the plans. This will be determined by the Engineer and Owner for placement of asphalt on existing asphalt surfaces to achieve adequate drainage.
- B. The bituminous pavement shall be composed of mineral aggregates, filler, or other material, if required and bituminous material, mixed in a central plant and placed hot.
- C. The work shall be in general accordance with Sections 401 and 403, Mississippi Standard Specifications for Road and Bridge Construction, latest edition.
- D. Contractor shall provide all permits, applications, licenses, and other qualifications to complete work at no additional cost to owner.
- E. Reference Standards: American Society for Testing and Materials, Annual Book of ASTM Standards, latest edition.

1.2 CONTRACTS

- A. Asphalt work to a single prime contractor.

1.3 CODES AND STANDARDS

- A. Perform asphalt work in compliance with applicable requirements of governing authorities having jurisdiction. County regulations supersede these specifications. Notify Landscape Architect in writing of all discrepancies immediately.

1.4 DO NOT MAKE SUBSTITUTIONS

- A. If Contractor desires to make substitutions of materials, sufficient descriptive literature and material samples must be furnished to establish the material as an equal substitute. In addition, Contractor must state his reasons for desiring substitute materials. Submit this request and information to Landscape Architect.

1.5 APPROVAL AND SELECTION MATERIALS AND WORK

- A. The selection of all materials and execution of all operations required under the Drawings and Specifications is subject to the approval of Owner and Landscape Architect. They have the right to reject any and all materials and any and all Work which, in their opinion, does not meet requirements of the Contract Documents at any state of operations. Contractor to remove rejected Work and or materials from Project Site and replace promptly.
- B. "As-Built" Drawings: Any changes in layout and/or arrangements of the proposed improvements, or any other differences between proposed system and actual installed conditions are to be recorded by Prime Contractor in the form of an "As-Built". Drawings are to be clearly and neatly drawn on a mylar sepia base of original design provided by the Landscape Architect. Provide Owner and Landscape Architect with a reproducible copy of the "As-Built" Drawings before Work under this Contract will be considered for

acceptance. Submittal of approved "As-Built" Drawings will preclude any Application for Final Payment by Contractor.

- C. Delivery, Storage and Handling: Deliver material and equipment in such a manner as to not damage parts or decrease the useful life of equipment.
- D. Store materials away from detrimental elements. Coordinate with General Contractor to secure a safe staging area.
- E. Handle, load, unload, stack and transport materials for irrigation system carefully to avoid damage. Handle pipe in accordance with Manufacturer recommendations.

1.7 WARRANTY

- A. All Work for a period of one year, starting on Date of Substantial Completion, against defects in material, equipment, Workmanship and any repair required resulting from leaks or other defects of workmanship, material or equipment.
- B. Repair unsatisfactory conditions promptly at no cost to Owner.
- C. Emergency repairs may be made by Owner without relieving the Contractor of this warranty obligation.
- D. Contractor to repair settling of backfilled trenches occurring during warranty period, including restoration of damaged plantings, paving or improvements resulting from settling of trenches or repair operations.
- E. Respond to Owner's request for repair Work within ten days. If not, Owner may proceed with such necessary repairs at Contractor's expense. In addition, Contractor shall be held responsible for replacement of any plant material (tree, shrubs, sod or seed) which becomes damaged or dies due to a lack of water during periods in which irrigation system is inoperable.

PART 2 - MATERIALS

2.1 SUMMARY

- A. Specific requirements concerning the various materials and arrangements which are safe to be installed are shown on drawings.

2.2 HOT BITUMINOUS PAVEMENT

- A. All materials and products shall conform with ALDOT Sections 401 and 403, and all related sections.

PART 3 - CONSTRUCTION REQUIREMENTS

3.1 SUMMARY

- A. It shall be Contractor's responsibility to ensure that all pavement areas constructed as a part of this project have sufficient slope to provide proper drainage. Minor grading of shoulders and other unpaved areas should be expected in order to provide proper drainage. Such work shall be absorbed in the cost of other items in the work and will not be measured for separate payment.
- B. During the installation Landscape Architect may make regular site visits and reject any Work and materials which do not meet the Standards called for in Contract Documents.

Rejected work must be promptly corrected and no time extension will be allowed for this reason.

3.2 REMOVAL OF PAVEMENT

- A. Removal of pavement shall be done by saw cutting to a clean edge where curbs are to be placed. All material and equipment need to perform this task shall be provided by the contractor and estimated into the bid.
- B. Cold milling of asphalt may be needed in areas to achieve proper grades for adequate drainage of the parking lot after curb structures are in place, and shall be included in the bid.

3.3 ASPHALT SURFACE

- A. Installation of asphalt surface course shall conform to applicable sections of M.D.O.T. Standard Specifications. Grade control shall be carefully controlled and transitions to adjacent asphalt shall be made to result in a smooth riding surface, within the tolerance which may be achieved using modern paving equipment.
- B. Tack coat is required under all asphalt courses. Apply heavy tack at joints with adjacent existing asphalt and at transitions where asphalt overlay is feathered.
- C. Asphalt shall measure not less than 1.5" in thickness throughout after compaction, with no negative tolerances allowed. If leveling lift are implemented for drainage, asphalt thickness will be variable, and the thickness shall be determined by Engineer and Owner.
- D. The Contractor shall ensure that the completed asphalt surface shall freely drain to the drainage inlets provided or to unpaved areas graded to properly drain. At the Engineer's discretion, any areas of standing water shall be corrected by the saw cutting and clean removal of at least 10'x10' of the failing asphalt surface course, and the subsequent replacement of additional asphalt, at no additional expense to Owner or Engineer.

3.4 ACCEPTANCE AND GUARANTEE

A. SUMMARY

1. Substantial Completion: Submit written requests for inspection for Substantial Completion to Landscape Architect at least three calendar days prior to anticipated Date of Inspection and Testing. Substantial Completion cannot be granted and at the same time no further applications for payment shall be approved for more than 85% of contract until there has first been a walk-thru at which time a "punch list" will be written consisting of items to be addressed and corrected by Contractor immediately. Depending on the extent of the Work on the "punch list", the Landscape Architect will determine the job to be Substantially Complete or pending the completion of the "punch list".
2. Submit record drawings and maintenance manuals to Landscape Architect with written request for inspection.
3. Review "punch list" Work jointly with Owner and Landscape Architect for Substantial Completion of total (contract) Work. (See "General Conditions", Article No. 9).
4. Upon satisfactory completion of repairs and replacements and completion of "As-Built" drawings, Landscape Architect and Owner will verify system for

Substantial Completion and issue AIA Certificate of Substantial Completion if all items on "punch list" have been completed. If necessary another "punch list" will be written to itemize any deficiencies still existing and will be attached to AIA Certificate. Contractor shall complete all "punch list" items if possible within 30 days while continuing maintenance.

B. DATE OF SUBSTANTIAL COMPLETION

1. Date of Substantial Completion will constitute beginning Date of One-Year Guarantee. This Date also constitutes the beginning of the warranty responsibilities and acceptance by Owner and Landscape Architect.

C. GUARANTEE

1. All Work, products, equipment and materials for one year, beginning at Date of Substantial Completion as per (AIA Certificate of Substantial Completion/written letter of notification).
2. Make good any damage, loss, destruction or failure. Repairs and replacements shall be done promptly and at no additional cost to Owner.
3. Repair damage to grade, plants and other Work or property as necessary.
4. If replacements are not acceptable during or at end of Guarantee Period, Owner may elect either subsequent replacement or credit. Replacement products shall have a similar one-year guarantee from time of replacement.
5. Guarantee applies to all unacceptable conditions or losses with exception of Master Irrigation Specifications

PART 4 - METHOD OF MEASUREMENT

- A. Crushed limestone road base shall be measured as the number of square yards of the minimum specified thickness (8") of completed work including testing, field measure.
- B. Hot Bituminous Surface Course and base course shall be measured as the number of tons of the minimum specified thickness of completed work, field measure.
- C. All saw cutting required to perform the work as shown on the Drawings and as required in these Specifications shall be absorbed by the Contractor and shall not be measured for separate payment. Where replacement paving adjoins existing pavement, the limits of the pavement to be removed shall be sawcut to form a neat, straight edge. Milling existing pavement at the transition to new pavement will not be acceptable and shall be reason for the contractor to sawcut the existing pavement beyond the location designated to form a neat, straight edge at the transition. The cost for any additional pavement required to be removed and replaced as a result of milling in lieu of saw cutting the transition edge shall be the absorbed by the contractor.
- D. Milling of existing pavements to facilitate smooth transitions between new asphalt pavement courses and existing asphalt pavements shall be measured by the square yard, regardless of depth, field measure.
- E. Removal of pavements, of all types and thicknesses, deemed necessary for removal, shall be measured by the square yard.

- F. Miscellaneous site work shall be measured for payment as a lump sum to include all work and costs necessary to complete the work not separately covered by other pay items. Payment for this item will be made upon completion of all other items.

PART 5 - PAYMENT

- A. The Hot Bituminous Surface Course Pay Item shall be considered complete and shall include all material, equipment, labor, installation costs, overhead and profit. Bidder shall verify quantities by his own take-off from the Drawings and notify the Landscape Architect of discrepancies before submitting his Bid.
- B. Payment will be made under PAY ITEM NO.

014003-A	MILLING EXISTING ASPHALT PAVEMENT	\$ _____	per square yard
014003-B	HOT BITUMINOUS SURFACE COURSE (12.5MM MIXTURE)	\$ _____	per ton
014003-C	HOT BITUMINOUS BASE COURSE (19MM MIXTURE)	\$ _____	per ton
014003-D	8" LIMESTONE ROAD BASE RESTORATION	\$ _____	per square yard
014003-E	REMOVAL OF PAVEMENT	\$ _____	per square yard
014003-F	SAWCUT	\$ _____	per linear foot
014003-G	MISCELLANEOUS SITE WORK	\$ _____	per lump sum

END OF DOCUMENT 014003

01 55 26 - MAINTENANCE OF TRAFFIC

PART 1 - SCOPE OF WORK

1.1 SUMMARY

- A. This work shall consist of all labor, materials, signs, and equipment necessary to maintain temporary access roads, detours, and generally provide for a safe traffic flow during the course of the project.

PART 2 - MATERIALS

2.1 SUMMARY

- A. All barricades, signs, temporary striping, flagmen, and other traffic control devices will conform to the latest edition of the Manual of Uniform Traffic Devices.

PART 3 - CONSTRUCTION REQUIREMENTS

3.1 SUMMARY

- A. As a minimum, the Engineer will erect and maintain traffic controls in conformance with the Manual of Uniform Traffic Control Devices.
- B. Contractor will place signage prior to construction work commencing on any portion of the project. All barricading, etc., will be in accordance with the latest edition of the Manual of Uniform Traffic Control Devices.
- C. The Contractor shall designate a responsible, qualified person prior to beginning construction to ensure that the Contractor properly constructs, installs, erects, and maintains all required traffic control devices. An inspection of the traffic control signs and devices shall be performed at periods not exceeding one week, regardless of construction activity within the project. The Contractor will be required to immediately rectify any noted deficiencies.
- D. Unless otherwise authorized, all roads and entrances to adjacent property will be kept open to through and local traffic.
- E. Whenever and wherever it is reasonably safe to do so, streets will remain open to traffic. When necessary to completely close a section of street, the Contractor shall publish a notice of street closure and a designated detour route in the local newspaper for 48 hours in advance of the road closure. Contractor shall also provide 48 hours advance notification to the local fire department, police department, traffic control and safety department and all local emergency services. Contractor shall also contact the Public School Transportation department, U.S. Postal Service and the waste disposal contractors to coordinate and provide for uninterruptable services. Should a street remain closed for an extended period, the Contractor shall contact all affected parties and publish notifications each day to provide an update on the status of the road closure, detours and availability of providing services.
- F. Contractor shall schedule work in a manner that will not impede the normal flow of traffic during daily peak traffic hours, holidays, weekends, and days of major public events in the general area. Contractor shall obtain proper authorization from Owner and Engineer in advance of performing work which may cause interruption of the normal flow of traffic.

- G. The Contractor shall at all times conduct his work as to insure the least practicable obstruction to traffic. The convenience of the general public, the residents along and adjacent to the roadway and the protection of persons and property are of prime importance and shall be adequately provided for by the Contractor. When the street subject to construction is open to the traveling public, the Contractor shall maintain both the subgrade and the surfacing in such condition that the public can travel over the same in comfort and safety, and shall at his own expense blade, grade, water for dust control, add additional material and provide additional compaction, as necessary, or when and as directed by the Engineer.
- H. Any activity that may affect the operation of traffic signals or advance detection devices shall be coordinated in advance with the Owner's Traffic Control and Safety Department. Contractor or Mississippi Department of Transportation as applicable. Contractor shall promptly restore pavement disturbed in the vicinity of traffic signals and advance detection devices to allow the Owner or ALDOT to restore traffic signal advance detection devices for the proper operation of traffic signals.
- I. Refer to Special Conditions in these contract documents for additional traffic control requirements.
- J. In the event where the contractor is fully or partially obstructing travel lanes with equipment, a certified flagger will have to be present. Contractor shall present flagger certifications once awarded bid.

PART 4 - METHOD OF MEASUREMENT

4.1 SUMMARY

- A. Maintenance of Traffic and all materials used for maintenance of traffic will be paid according to the lump sum bid price on the basis of a percentage of the work completed not including the Maintenance of Traffic item.
- B. All materials used for Maintenance of Traffic will not be measured for separate payment and shall be included for payment in the Maintenance of Traffic item.
- C. If the contractor doesn't provide adequate Maintenance of Traffic duties during the course of the project, he shall be subject to "liquidated damages" in the amount of \$350/day for breach of contract. The Engineer or his representative shall determine compliance with these specifications and, in the case of non-compliance, shall notify the Contractor, in writing, of the project areas that require immediate attention. Should the contractor fail to initiate appropriate actions within 4 hours of written notice of non-compliance and satisfactorily perform the responsibilities of Maintenance of Traffic, the penalty amount of \$350/day shall accrue until the deficiencies are corrected. Any accrued damages amounts shall be deducted from monthly payment applications.
- D. The maximum percentage of this pay item that will be paid to the contractor is 85% until the project is accepted by the Engineer and Owner.
- E. In addition to the accrued liquidated damages for failure to provide adequate Maintenance of Traffic, the Engineer reserves the right to withhold processing monthly payment applications until the contractor is in compliance with these contract documents.

PART 5 - PAYMENT

A. Payment will made under PAY ITEM NO.

015526-A MAINTENANCE OF TRAFFIC

\$ _____ per lump sum.

END OF DOCUMENT 015526

01 57 23 - SWPPP

PART 1 - SCOPE OF WORK

1.1 SUMMARY

- A. This work shall consist of supplying, constructing, and maintaining throughout the period of construction, stormwater management (erosion control) structures and devices. As construction proceeds, additional controls may be necessary, as required by site conditions, by Contractor's methods of construction and restoration, or as directed by the Engineer.
- B. The work shall also include creating, implementing, and adhering to the Storm Water Pollution Prevention Plan (SWPPP), and Storm Water General NPDES permit issued by the Mississippi Department of Environmental Quality. Contractor shall create, apply for and obtain the necessary permits prior to construction.
- C. The work shall also include monitoring and inspecting stormwater management of structures and completing and submitting appropriate monitoring reports. A copy of the monthly monitoring report shall be submitted to the Engineer and shall be attached to each month's application for payment.
- D. The contractor will be required to complete and execute the Mississippi Department of Environmental Quality Transfer of Permit form, which will transfer full and complete responsibility of storm water control implementation and compliance to the Contractor.
- E. Contractor's responsibility to inspect, maintain, and write inspection reports under this item may continue past the end of the construction period, until permanent vegetation has been satisfactorily established. This activity will be considered to be a warranty obligation of the Contractor, backed by the one-year Performance Bond furnished under the contract.

PART 2 - MATERIALS

2.1 SUMMARY

- A. Silt Fence materials shall be in accordance with Section 234.02, ALDOT Specifications.
- B. Wattles shall be a straw-filled tube of flexible netting material.
- C. Erosion Checks (Hay Bales) shall be in accordance with Section 235.02, ALDOT Specifications.
- D. Grass and Sod shall be in accordance with the Restoration of Disturbed Facilities item of these technical specifications.
- E. Other materials as may be required by Contractor's approved SWPPP.

PART 3 - CONSTRUCTION REQUIREMENTS

3.1 SUMMARY

- A. Upon the Notice of Award, Contractor shall create, apply for, and, as appropriate, submit and obtain approval for a Stormwater Pollution Prevention Plan, in

Contractor's name and in compliance with the requirements of the MS Department of Environmental Quality. Contractor shall issue a Construction Notice of Intent prior to beginning construction operations and at all times shall maintain stormwater management devices and Best Management Practices in compliance with the permit and MDEQ requirements. Contractor shall supply copies of all permit documents to Engineer prior to commencing construction operations.

- B. The material and performance specifications detailed herein are a guide intended to assist the Contractor in development of a satisfactory SWPPP and in obtaining MDEQ permit approval. Contractor's SWPPP may have additional, more stringent, requirements for materials and performance.
- C. Silt Fences shall be constructed along the limits of work, at a minimum, and as may be otherwise required, or as directed by the Engineer.
 - 1. All posts shall be installed so that no more than three (3) feet of the post shall protrude above the ground. Extra posts for bracing shall be installed as directed by the Engineer. The woven wire shall be securely fastened to the wood posts with staples. When metal posts are used, the wire shall be fastened to the post with wire or other approved means. The fabric shall be attached to the wire fence by wire or other approved means. The bottom edge of the fabric shall be buried 6" below ground surface to prevent undermining. When splicing of the fabric is necessary, two posts shall be installed approximately 18" apart and each piece of fabric shall be fastened to both posts.
 - 2. The fabric will be rejected if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, storage or installation.
 - 3. Silt fence may be installed without woven wire provided that all of the conditions stated in paragraph 234.03.1, ALDOT Specifications are
- E. Wattles shall be installed in prepared trenches, insuring that no gaps exist between the soil and the bottom of the wattle. The ends of adjacent wattles should be tightly abutted so that no opening exists for water or sediment to pass through. Alternately, wattles may be lapped, 6-inch minimum to prevent sediment passing through the field joint. Wooden stakes should be used to fasten wattles to the soil, in accordance with the manufacturer's requirements.
- F. The Erosion Checks shall be constructed according to the requirements shown on the plans, and at a minimum at all drainage inlets within the limits of the work and spaced at no more than 300' on center in any affected drainage ditch or swale within the work area, and as may be otherwise required, or as directed by the Engineer. Erosion checks required along the toe of fill slopes shall be constructed prior to grading operations at the site. For other locations, the erosion checks shall be constructed when directed by the Engineer. The soil shall be excavated at least three inches in depth to embed the baled material. After securing in place, a sufficient quantity of the excavated material shall be placed around the erosion check and compacted to prevent undermining.
- G. Silt Basin shall be constructed to the dimensions and at the locations shown on the plans, at a minimum, and as may be otherwise required, or as directed by the Engineer. The silt basins shall be cleaned out as frequently as necessary to have at least 50% of the basin capacity available at all times. The silt basins shall be backfilled and the areas shaped and dressed for seeding and mulching prior to

completion of the project unless otherwise directed by the Engineer. Grassing shall be done in accordance with the provisions contained in these specifications.

- H. Grass seed and sod shall be in accordance with the Restoration of Disturbed Facilities Section of these specifications.
- I. Monitoring, Maintenance and Removal
 - 1. The Contractor shall adhere to the approved Stormwater Management Plan. This Plan requires the monitoring and reporting of on-site stormwater management devices. Monitoring shall occur at least once a week, for a minimum of four inspections per month. A maintenance report shall be made after each inspection. The Contractor shall be responsible for reporting to MDEQ or others specified in the Permit.
 - 2. The Contractor shall maintain all silt fences, erosion checks, silt basins, and other controls which may be required, throughout the project. When silt fences become ineffective or torn, it shall be replaced. Maintenance shall be performed immediately as necessary to prevent erosion.
 - 3. When silt has accumulated against stormwater management devices, it shall be removed as directed by the Engineer.
 - 4. When stormwater management devices are no longer needed (grass or vegetation has been established), they shall be removed and shall become the property of the Contractor. The area shall be neatly restored and given a pleasing appearance. All bare areas shall be seeded or sodded as directed by the Engineer.
- J. Submittals - The Contractor shall prepare and submit to the Engineer the following documents. Additionally, the Contractor shall maintain a copy of each of these documents on site for the duration of the project.
 - 1. The Contractor's Stormwater Pollution Prevention Plan (SWPPP) in accordance with MDEQ Best Management Practices (BMP). The SWPPP should indicate which BMPs will be used.
 - 2. A monitoring program and reporting plan for ensuring the proper implementation of the SWPPP and correct function of BMPs.
 - 3. Any amendments to the SWPPP necessitated by a change in construction or operations or by failure to achieve the general objective of the SWPPP.

PART 4 - METHOD OF MEASUREMENT

4.1 SUMMARY

- A. Stormwater Management will be paid according to the lump sum bid price on the basis of a percentage of the work completed, not including the Stormwater Management item. Such payment will be considered full compensation for the work described herein, inclusive of the development of a satisfactory SWPPP and other miscellaneous items of work described.
- B. No additional payment will be made for storm water control measures which may be required in addition to those shown in the plans, if any.

- C. Vegetative Cover (seeding), solid sod, and excelsior blanket will be measured and paid for under the Restoration of Disturbed Facilities Item of the specifications, only when the required restoration is within the authorized trench limits. Any seeding or sodding which is required for erosion control outside the authorized trench limit will not be separately measured for payment. Contractor is encouraged to limit damage to natural vegetation.
- D. A copy of each erosion control monitoring report shall be submitted with each application for payment. No application for payment will be processed unless the appropriate forms are attached and all storm water controls are erected, satisfactorily maintained, and in compliance with all permit conditions and regulations.
- E. Upon notification from Engineer, Contractor's failure to rectify and properly perform the Stormwater Management shall result in "liquidated damages" withheld from successive applications for payment. Days for the calculation of "Liquidated damages" withheld shall be measured from the date of Engineer's notification until Contractor's successful remediation and performance of the Stormwater Management per the requirements of the permit and Best Management Practices (Calendar Days). Regardless of Engineer's notification, should actual damages for failure to properly provide Stormwater Management exceed the "liquidated damages" withheld, the difference will be additionally withheld. Amounts charged as "Liquidated Damages" for failure to perform Stormwater Management shall be based on the initial Contract Value, per the following schedule.

<u>Initial Contract Value</u>	<u>Amount Withheld</u>
\$0 - \$250,000	\$50 l day
\$250,000+ - \$500,000	\$75 l day
\$500,000+ - \$1,000,000	\$100 l day
\$1,000,000+	\$125 l day

PART 5 - PAYMENT

- A. Payment will made under PAY ITEM NO.

015723-A STORMWATER MANAGEMENT

\$ _____ per lump sum.

END OF DOCUMENT 015723

DOCUMENT 016205 – REMOVAL OF EXISTING THERMOPLASTIC PAVEMENT MARKINGS.

PART 1 – SCOPE OF WORK

1.1 SUMMARY

- A. This work shall consist of furnishing all tools, equipment, and labor to remove existing thermoplastic pavement markings from pavement surfaces.

PART 2 – MATERIALS

2.1 SUMMARY

- A. Remove existing pavement marking by water blasting, grinding, sandblasting, or other method approved by the Engineer. Do not use chemicals for the removal of thermoplastic pavement markings.
- B. Provide positive means to control dust and accumulation of debris from the removal operations. Remove all pavement marking materials from the pavement surface. Remove accumulated piles of any debris as a result of the removal operation from the right of way and dispose of in accordance with applicable Federal, State, and Local Rules and Regulations, at no additional cost to the Department.
- C. Apply new thermoplastic pavement markings meeting the requirements of Section 711 before the end of the workday.

PART 3 – CONSTRUCTION REQUIREMENTS

3.1 SUMMARY

- A. Conduct removal operations in a manner that will not damage existing pavement surfaces (concrete or asphalt) or damage pavement joint materials. Repair, to the satisfaction of the Engineer, any damage as a result of the removal operations.
- B. Do not paint over existing pavement markings to blackout, hide, or disguise markings.

PART 4 – METHOD OF MEASUREMENT

4.1 SUMMARY

- A. The quantities to be paid for will be the area, in lump sum, of existing thermoplastic pavement markings as indicated on the plans.

PART 5 - PAYMENT

- A. Payment will be made under PAY ITEM NO.

016205-A REMOVAL OF EXISTING THERMOPLASTIC STRIPE
 \$ _____ per lump sum

END OF DOCUMENT 016205

TECHNICAL SPECIFICATIONS

DIVISION 2 SITEWORK

SECTION 02 41 16 STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of buildings and site improvements.
 - 2. Removing below-grade construction.
 - 3. Disconnecting, capping or sealing, and removing site utilities.
 - 4. Salvaging items for reuse by Owner.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for use of the premises and phasing requirements.
 - 2. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade site improvements not part of building demolition.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse. Include fasteners or brackets needed for reattachment elsewhere.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PREINSTALLATION MEETINGS

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

1. Inspect and discuss condition of construction to be demolished.
2. Review structural load limitations of existing structures.
3. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review and finalize protection requirements.
5. Review procedures for noise control and dust control.
6. Review procedures for protection of adjacent buildings.
7. Review items to be salvaged and returned to Owner.

1.6 INFORMATIONAL SUBMITTALS

- A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property for dust control and for noise control. Indicate proposed locations and construction of barriers.
 1. Adjacent Buildings: Detail special measures proposed to protect adjacent buildings and infrastructure to remain.
- B. Schedule of Building Demolition Activities: Indicate the following:
 1. Detailed sequence of demolition work, with starting and ending dates for each activity.
 2. Temporary interruption of utility services.
 3. Shutoff and capping or re-routing of utility services.
- C. Predemolition Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Comply with Section 013233 "Photographic Documentation." Submit before the Work begins.

1.7 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 FIELD CONDITIONS

- A. Buildings to be demolished will be vacated and their use discontinued before start of the Work.
- B. Buildings immediately adjacent to demolition area may be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.
 1. Provide not less than **72** hours' notice of activities that will affect operations of adjacent occupied buildings.
 2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.
 - a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.
- C. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Contractor under the contingency allowance.
 - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- E. On-site storage or sale of removed items or materials is not permitted.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

2.2 SOIL MATERIALS

- A. Satisfactory Soils: Comply with requirements in Section 312000 "Earth Moving."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting demolition operations.
- B. Verify that hazardous materials have been identified and remediated before proceeding with building demolition operations.
- C. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations. Comply with Section 013233 "Photographic Documentation.

3.2 PREPARATION

- A. Salvaged Items: Comply with the following:
 - 1. Clean salvaged items of dirt and demolition debris.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Utilities to be Disconnected: Locate, identify, disconnect, and seal or cap off utilities serving buildings and structures to be demolished.
 - 1. Owner will arrange to shut off utilities when requested by Contractor.
 - 2. Arrange to shut off utilities with utility companies.
 - 3. If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
 - 4. Remove pipe or conduit back to street main, unless shared with other site facilities or intended for reuse. In each case, remove the maximum amount before capping.
 - 5. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.4 PROTECTION

- A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.
- B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of demolition.
- C. Existing Utilities to Remain: Maintain utility services to remain and protect from damage during demolition operations.
 - 1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
 - 2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.
 - a. Provide at least **72** hours' notice to occupants of affected buildings if shutdown of service is required during changeover.
- D. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated.
 - 1. Protect adjacent buildings and facilities from damage due to demolition activities.
 - 2. Protect existing site improvements, appurtenances, and landscaping to remain.
 - 3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
 - 4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
 - 6. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
 - 7. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.
- E. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.5 DEMOLITION, GENERAL

- A. General: Demolish indicated buildings and site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
 - 2. Maintain fire watch during and for at least **2** hours after flame-cutting operations.
 - 3. Maintain adequate ventilation when using cutting torches.
 - 4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

- B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
 - 2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
- C. Explosives: Use of explosives is not permitted.

3.6 DEMOLITION BY MECHANICAL MEANS

- A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.
- B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.
- C. Salvage: Items to be removed and salvaged are indicated on Drawings.
- D. Below-Grade Construction: Abandon foundation walls and other below-grade construction. Cut below-grade construction flush with grade.
- E. Below-Grade Construction: Demolish foundation walls and other below-grade construction that are within footprint of new construction and extending **5 feet** outside footprint indicated for new construction.
 - 1. Remove below-grade construction, including basements, foundation walls, and footings, completely.
- F. Existing Utilities: Abandon existing utilities and below-grade utility structures. Cut utilities flush with grade.
- G. Existing Utilities: Demolish and remove existing utilities and below-grade utility structures.

3.7 SITE RESTORATION

- A. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.
- B. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with satisfactory soil materials according to backfill requirements in Section 312000 "Earth Moving."

- C. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.8 REPAIRS

- A. Promptly repair damage to adjacent buildings caused by demolition operations.

3.9 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Do not burn demolished materials.

3.10 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.
 - 1. Clean roadways of debris caused by debris transport.

END OF SECTION 02 41 16

DIVISION 03 CONCRETE

SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1- GENERAL

1.01 SCOPE OF WORK

- A. Description of scope and intent
 1. CONTRACTOR shall provide all material, labor, and tools required to complete the installation of specified system.
 2. Any omission of reference to items required to complete the full operational and functional system specified in the section does not relieve the CONTRACTOR of the obligation to provide same.
 3. To provide installation of all items, including delivery, dispersing to the proper locations within the building, and affixing in place.
 4. Installation shall be accomplished by workers skilled in their craft that will perform their work in a professional manner and will leave the premises safe, orderly and clean.
 5. Drawings and general provisions of Contract, including General and Supplemental Conditions and Division 1 Specification Sections, apply to this Section.
 6. CONTRACTOR is responsible for coordination of work included in this specification with all other specification sections related to furnishing of all materials, labor, permits, fees and services necessary for completion of work in this section.

- B. Section Includes:
 1. Formwork for cast in place concrete, with shoring, bracing, and anchorage.
 2. Formwork accessories.
 3. Form stripping.
 4. Reinforcing steel for cast in place concrete.
 5. Grout.
 6. Cast in place concrete, including concrete for the following:
 - a. Foundations, footings.
 - b. Slabs on grade.
 - c. Supported slabs.
 - d. Foundation and structural walls.
 - e. Equipment pads and bases.
 7. Concrete curing.
 8. Shoring and reshoring.

1.02 REFERENCES

All referenced standards refer to the edition in force at the time these plans and Specifications are issued for bidding.

- A. AASHTO M 182 Standard Specification for Burlap Cloth Made from Jute or Kenaf; American Association of State Highway and Transportation Officials.

- B. ACI 117 Standard Tolerances for Concrete Construction and Materials; American Concrete Institute.

- C. ACI 201.2R Guide to Durable Concrete; American Concrete Institute.

- D. ACI 211.1 Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute.
- E. ACI 214 Recommended Practice for Evaluation of Compression Test Results of Field Concrete.
- F. ACI 301 Specifications for Structural Concrete for Buildings; American Concrete Institute.
- G. ACI 302.1R Guide for Concrete Floor and Slab Construction; American Concrete Institute.
- H. ACI 304R Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute.
- I. ACI 305R Hot Weather Concreting; American Concrete Institute.
- J. ACI 306R Cold Weather Concreting; American Concrete Institute.
- K. ACI 318 Building Code Requirements for Reinforced Concrete; American Concrete Institute.
- L. ACI 347R Guide to Formwork for Concrete; American Concrete Institute.
- M. ACI 350 Code Requirements for Environmental Engineering Concrete Structures.
- N. ACI 350.1 Specification for Tightness Testing of Environmental Engineering Concrete Containment Structures & Commentary
- O. ACI 372 Guide to Design and Construction of Circular Wire-and-Strand-Wrapped Prestressed Concrete Structures
- P. ACI SP 66 ACI Detailing Manual; American Concrete Institute.
- Q. ASTM A 185 Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
- R. ASTM A 615 Standard Specification for Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
- S. ASTM C 31 Standard Practice for Making and Curing Concrete Test Specimens in the Field.
- T. ASTM C 33 Standard Specification for Concrete Aggregates.
- U. ASTM C 39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- V. ASTM C 42 Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
- W. ASTM C 94 Standard Specification for Ready Mixed Concrete.

- X. ASTM C 143 Standard Test Method for Slump of Hydraulic Cement Concrete.
- Y. ASTM C 150 Standard Specification for Portland Cement.
- Z. ASTM C 171 Standard Specifications for Sheet Materials for Curing Concrete.
- AA. ASTM C 172 Standard Practice for Sampling Freshly Mixed Concrete.
- BB. ASTM C 173 Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
- CC. ASTM C 231 Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
- DD. ASTM C 260 Standard Specifications for Air Entraining Admixtures for Concrete.
- EE. ASTM C 494 Standard Specifications for Chemical Admixtures for Concrete.
- FF. ASTM C 618 Standard Specifications for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
- GG. ASTM C 685 Standard Specifications for Concrete Made by Volumetric Batching and Continuous Mixing.
- HH. ASTM C 881 Standard Specification for Epoxy Resin Base Bonding Systems for Concrete.
- II. ASTM C 1059 Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete.
- JJ. ASTM C 1107 Standard Specification for Packaged Dry, Hydraulic Cement Grout (Nonshrink).
- KK. ASTM D 1751 Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- LL. ASTM D 1752 Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
- MM. ASTM E 154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth under Concrete Slabs, on Walls, or as Ground Cover.
- NN. ASTM E 329 Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
- OO. CRSI Manual of Standard Practice; Concrete Reinforcing Steel Institute.
- PP. Florida Building Code – FBC

1.03 DEFINITIONS

- A. Unexposed Finish: A general use finish, with no appearance criteria, applicable to all

formed concrete concealed from view after completion of construction.

- B. Exposed Finish: A general use finish applicable to all formed concrete exposed to view except those indicated to receive textured finish and including surfaces which may receive a paint coating (if any).

1.04 SUBMITTALS

- A. All submittals shall be submitted in accordance with Section 01300.
- B. Product Data: Submit manufacturer's product data for the following:
 - 1. Formwork accessories.
 - 2. Form liners.
 - 3. Concrete admixtures.
 - 4. Grout.
 - 5. Bonding compound.
 - 6. Epoxy bonding system
- C. Aggregates: Submit test reports showing compliance with specified quality and gradation.
- D. Shop Drawings: Submit shop drawings for fabrication and placement of the following:
 - 1. Reinforcement: Comply with ACI SP 66. Include bar schedules, diagrams of bent bars, arrangement of concrete reinforcement, and splices.
 - a. Show construction joints.
 - b. Include details of reinforcement at openings through concrete structures.
 - c. Include elevations of reinforcement in walls.
 - d. Show stirrup spacing.
 - e. Concrete embedment's.
 - 2. Shoring and reshoring for elevated concrete placement shall include:
 - a. Location, size, and type of all shoring members.
 - b. Location, size, and type of all reshoring members.
 - c. Location, size, and type of all mud sills, blocking, temporary lateral bracing and other accessories necessary to safely support and brace the structure during construction.
 - d. Prepare shop drawings under seal of professional structural ENGINEER registered in the state of Florida.
- E. Quality Control Submittals
 - 1. Submit the following information related to quality assurance requirements specified:
 - 2. Design data: Submit proposed mix designs and test data before concrete operations begin. Identify for each mix submitted the method by which proportions have been selected.
 - a. For mix designs based on trial mixtures, include trial mix proportions, test results, and graphical analysis and show required average compressive strength $f'(cr)$.
 - b. Indicate quantity of each ingredient per cubic yard of concrete.
 - c. Indicate type and quantity of admixtures proposed or required.
 - 3. Test reports: Submit laboratory test reports for all testing specified.
 - 4. Certifications: Submit affidavits from an independent testing agency certifying that all materials furnished under this section conform to specifications.
 - 5. Certifications: Provide certification from manufacturers of concrete admixtures that chloride content complies with specified requirements.
 - 6. Certifications: Submit mill test certificates for all reinforcing steel furnished under this

- section, showing physical and chemical analysis.
7. Placement schedule: Submit concrete placement schedule prior to start of any concrete placement operations. Include location of all joints indicated on drawings, plus anticipated construction joints.
 8. Submit batch tickets complying with ASTM C 685 or delivery tickets complying with ASTM C 94, as applicable, for each load of concrete used in the work.
 - a. Include on the tickets the additional information specified in the ASTM document.
 9. Cold weather concreting: Submit description of planned protective measures.
 10. Hot weather concreting: Submit description of planned protective measures.
 11. Mass Concrete: Submit description of planned protective measures.

1.05 QUALITY ASSURANCE

- A. Codes and Standards: Comply with the following documents, except where requirements of the contract documents or of governing codes and governing authorities are more stringent:
 1. ACI 301
 2. ACI 318
 3. ACI 350
 4. CRSI Manual of Standard Practice.
- B. Testing Agency Services:
 1. Employ, at CONTRACTOR's expense, an independent testing agency acceptable to the ENGINEER to perform specified tests and other services required for quality assurance.
 - a. Testing agency shall meet ASTM E 329 requirements.
- C. Source of Materials: Obtain materials of each type from same source for the entire project.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver reinforcement to project site bundled and tagged with metal tags indicating bar size, lengths, and other data corresponding to information shown on placement drawings.
 1. Concrete reinforcement materials stored on the site shall be kept on concrete blocks and supported off the ground to prevent damage and accumulation of water, dirt, or rust.
- B. Store cementitious materials in a dry, weather tight location. Maintain accurate records of shipment and use.
- C. Store aggregates to permit free drainage and to avoid contamination with deleterious matter or other aggregates. When stockpiled on ground, discard bottom 6 inches of pile.
- D. Handle aggregates to avoid segregation.

1.07 PROJECT CONDITIONS

- A. Cold Weather Concreting: Comply fully with the recommendations of ACI 306.
 1. Well in advance of proposed concreting operations, advise the ENGINEER of planned protective measures including but not limited to heating of materials, heated enclosures, and insulating blankets.

- B. Hot Weather Concreting: Comply fully with the recommendations of ACI 05R.
 - 1. Well in advance of proposed concreting operations, advise the ENGINEER of planned protective measures including but not limited to cooling of materials before or during mixing, placement during evening to dawn hours, fogging during finishing and curing, shading, and windbreaks.

- C. Mass Concrete: Comply fully with the recommendations of ACI 207.1R.
 - 1. Well in advance of proposed concreting operations, advise the ENGINEER of planned protective measures including but not limited to cooling of materials before or during mixing, placement, curing, forms, height of lifts (max 8ft), and monitoring.

PART 2- PRODUCTS

2.01 FORMWORK

- A. Facing Materials:
 - 1. Unexposed finish concrete: Any standard form materials that produce structurally sound concrete.
 - 2. Exposed finish concrete: Materials selected to offer optimum smooth, stain free final appearance and minimum number of joints. Provide materials with sufficient strength to resist hydrostatic head without bow or deflection in excess of allowable tolerances.
 - 3. Textured finish concrete: Materials or linings as indicated on the drawings, or as required to match ENGINEER's control sample.

- B. Formwork Accessories:
 - 1. Form coating: Form release agent that will not adversely affect concrete surfaces or prevent subsequent application of concrete coatings.
 - 2. Metal ties: Commercially manufactured types; cone snap ties, taper removable bolt, or other type which will leave no metal closer than 1-1/2 inches from surface of concrete when forms are removed, leaving not more than a 1 inch diameter hole in concrete surface.
 - 3. Fillets: Wood or plastic fillets for chamfered corners, in maximum lengths possible.

2.02 REINFORCING MATERIALS

- A. Reinforcing Bars: Provide deformed bars complying with the following, except where otherwise indicated:
 - 1. ASTM A 615, Grade 60.

- B. Welded Wire Fabric: ASTM A 185, cold drawn steel, plain.

- C. Reinforcing Accessories:
 - 1. Tie wire: Black annealed type, 16-1/2 gage or heavier.
 - 2. Supports: Bar supports conforming to specifications of CRSI "Manual of Standard Practice."
 - a. Class 1 (plastic protected) at all formed surfaces which will be exposed to weather.
 - b. Class 1 (plastic protected) or Class 2 (stainless steel protected) at all formed surfaces which will be exposed to view but not to weather.
 - c. Precast concrete blocks of strength equal to or greater than specified strength of concrete or Class 3 supports equipped with sand plates, where concrete will be cast against earth. Concrete masonry units will not be accepted.

2.03 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, and as follows:
1. Type I, except where other type is specifically permitted or required.
 2. Type II shall be used for moderate sulfate resistance conditions, retaining walls and exposed concrete not included in Type V below and when hot weather concreting is required.
 3. Type III shall be used for high early strength and when cold weather concreting is required.
 4. Type IV shall be used for low heat of hydration when mass concreting is required.
 5. Type V shall be used for high sulfate resistance conditions, all environmental and all water or wastewater liquid retaining structures (includes all wet well surfaces). (An alternate Type V cement mixture shall be a Type I/II. The CONTRACTOR shall submit the Type I/II cement for review, concrete mix design where the Type I/II was utilized and 30 concrete break test results of where the Type I/II cement was implemented).
- B. Fly Ash: ASTM C 618, Type C or F.
- C. Water: Potable.
- D. Aggregates:
1. Normal weight concrete: ASTM C 33.
 - a. Class 5M.
 - b. Gradation as specified below under mix design.
- E. Admixtures General: Admixtures which result in more than 0.1 percent of soluble chloride ions by weight of cement are prohibited.
- F. Air Entraining Admixture: ASTM C 260 and certified by manufacturer for compatibility with other mix components.
1. Products: The following products, provided they comply with requirements of the contract documents, will be among those considered acceptable:
 - a. "Air Mix"; The Euclid Chemical Company.
 - b. "Sika Aer"; Sika Corporation.
 - c. "Micro Air"; Master Builders, Inc.
 - d. "Darex AEA"; W. R. Grace & Co.
- G. Water Reducing, Retarding Admixture: ASTM C 494, Type D.
1. Products: The following products, provided they comply with requirements of the contract documents, will be among those considered acceptable:
 - a. "Pozzolith Retarder"; Master Builders, Inc.
 - b. "Eucon Retarder 75"; The Euclid Chemical Company.
 - c. "Daratard 17"; W. R. Grace & Co.
 - d. "PSI R Plus"; Cormix Construction Chemicals.
 - e. "Plastiment"; Sika Corporation.
 - f. "Protard"; Master Builders, Inc. (former Conchem product).
- H. Water Reducing and Accelerating Admixtures: ASTM C 494, Type E.
1. Products: The following products, provided they comply with requirements of the contract documents, will be among those considered acceptable:
 - a. "Accelguard 80"; The Euclid Chemical Company.
 - b. "Pozzutec 20"; Master Builders, Inc.

- c. "Gilco Accelerator"; Cormix Construction Chemicals.
- I. High Range Water Reducing Admixture (Superplasticizer): ASTM C 494, Type F or G.
 - 1. Products: The following products, provided they comply with requirements of the contract documents, will be among those considered acceptable:
 - a. "WRDA 19" or "Daracem 100"; W. R. Grace & Co.
 - b. "PSP Superplasticizer"; Master Builders, Inc. (former Conchem product).
 - c. "Sikament 300"; Sika Corporation.
 - d. "Eucon 37"; The Euclid Chemical Company.
 - e. "PSI Super"; Cormix Construction Chemicals.
 - f. "Rheobuild"; Master Builders, Inc.

2.04 MISCELLANEOUS MATERIALS AND ACCESSORIES

- A. Vapor Retarder: Membrane for installation beneath building slabs on grade, resistant to decay when tested in accordance with ASTM E 154, and as follows:
 - 1. Polyethylene sheet, not less than 8 mils thick.
- B. Nonshrink Grout: ASTM C 1107.
 - 1. Minimum 4000 psi grout compressive strength
 - 2. Type: Provide nonmetallic type only.
 - 3. Products: The following products, provided they comply with requirements of the contract documents, will be among those considered acceptable:
 - a. Nonmetallic type:
 - 1) "Masterflow 928"; Master Builders, Inc.
 - 2) "SonogROUT 14k"; Sonneborn Building Products Division ChemRex, Inc.
 - 3) "Euco N S Grout"; The Euclid Chemical Company.
 - 4) "Supreme"; Cormix Construction Chemicals.
 - 5) "Five Star Grout"; Five Star Products, Inc.
- C. Burlap: AASHTO M 182, Class 2 jute or kenaf cloth.
- D. Moisture Retaining Cover: ASTM C 171, and as follows:
 - 1. Curing paper.
 - 2. Polyethylene film.
 - 3. White burlap polyethylene sheeting.
- E. Bonding Compound: Non redispersable acrylic bonding admixture, ASTM C 1059, Type II.
 - 1. Products: The following products, provided they comply with requirements of the contract documents, will be among those considered acceptable:
 - a. "Everbond"; L & M Construction Chemicals, Inc.
 - b. "Flex Con"; The Euclid Chemical Company.
- F. Epoxy Bonding Systems: Epoxy adhesive for bonding fresh concrete to hardened concrete and for grouting wall pipes, bolts and reinforcing dowels. ASTM C 881; type, grade, and class as required for project conditions.
 - 1. Products: The following products, provided they comply with requirements of the contract documents, will be among those considered acceptable:
 - a. "Concresive LPL"; Master Builders, Inc.
 - b. "Sikadur 32 Hi Mod"; Sika Corporation.
 - c. "Euco #452 Epoxy System"; The Euclid Chemical Company.
 - d. "Sikastix 390".

- e. "EucoEpoxy 461".
 - f. "Five Star Epoxy Grout".
 - g. "Sikstix 370".
 - h. "EucoEpoxy 463".
- G. Expansion Joint Filler
- 1. Expansion Joint Filler shall be performed non-extruding and resilient type meeting the Specifications of ASTM D1751, or D1752, unless otherwise specified.
 - 2. All expansion joints in base slabs on grade other than hydraulic structures shall be fiber expansion joints of required slab depth meeting the requirement of ASTM D1751, Type I and AASHTO M213. Exposed joints shall be sealed as specified below.
 - 3. All expansion joints in hydraulic structures shall be $\frac{3}{4}$ inch sponge rubber expansion joints of required wall thickness meeting the requirements of ASTM D1752, Type I and AASHTO M153, Type I. Joints shall be sealed on both sides as specified below.
 - a. Nonextruding bituminous type: ASTM D 1751.
 - b. Sponge rubber type: ASTM D 1752, Type I.
- H. Expansion Joint Sealer
- 1. Joint sealants for hydraulic structures shall be one of the following, or approved equal:
 - a. "CM-60" two-part gray tone, as manufactured by W. R. Meadows, Inc., applied over a backer rod sized for the joint. Underwater primer shall be used on all joints subject to immersion. Standard "CM-60" primer shall be applied to all other joints. Sealant depth shall be one-half the width of the joint.
 - b. The sealant shall be a two-part, polyurethane sealant "Eucolastic I" by the Euclid Chemical Company or "Sikaflex 1a" by Sika Chemical Company. Joint width should be 4 times the expected joint movement, but not less than $\frac{1}{4}$ inch. All joints shall be primed with "Eucolastic Primer" by the Euclid Chemical Company or "Sikaflex 429" by Sika Chemical Company.
- I. PVC Waterstops
- Waterstops: Made of Polyvinyl Chloride (PVC) and of subzero grade, Plastigrip, Type W-6 as manufactured by Progress Unlimited, Inc. or approved equivalent.
- 1. Minimum 4" x 3/16" or as specified on the drawings.
 - 2. Produced from a compound, the base resin of which shall be virgin PVC.
 - 3. Minimum Properties:
 - a. 2000 psi minimum tensile strength, ASTM D412-51T
 - b. 350% minimum elongation, ASTM D412-51T
 - c. -35 degrees F minimum low temperature brittleness, ASTM D746-57T
 - d. 65-75 shore 'A' durometer hardness, ASTM D676-59T
 - e. 0.15 maximum water absorption, ASTM D570-59T
 - 4. Field Splicing:
 - a. Butt splices shall be fused welded using a thermostatically controlled Teflon PVC Waterstop iron at the Manufacturer's recommended temperature
 - b. Lapping, gluing or use of adhesives shall not be permitted.
 - c. Provide factory made waterstop fabrications for all changes of directions, intersections, and transitions leaving only butt joint splicing for the field.
 - 5. Center waterstop in the joint and secure in correct position.
 - 6. Use ribbed center bulb for all moving joints. Use dumbbell for all non-movement joints.
 - 7. Always place the center bulb in the center of the expansion joint. Do not embed the

- center bulb in concrete.
8. Vibrate concrete around waterstops thoroughly to prevent honeycombing and to ensure contact between concrete and waterstop.

2.05 CONCRETE MIX DESIGN

- A. Review: Do not begin concrete operations until proposed mix has been reviewed by the ENGINEER.
 - B. Proportioning of Normal Weight Concrete: Comply with recommendations of ACI 211.1.
 - C. Required Average Strength: Establish the required average strength $f'(cr)$ of the design mix on the basis of trial mixtures as specified in ACI 301, and proportion mixes accordingly. Employ an independent testing agency acceptable to the ENGINEER for preparing and reporting proposed mix design.
 - D. Proportion normal-weight concrete mix to produce an average strength at 28 day as follows unless otherwise indicated on the drawings:
 1. Columns, beams, walls, footings and slabs: 4000 psi
 2. Masonry Filled Grout: 3000 psi
 3. Prestressed Elements: 5000 psi
 - E. Fly Ash:
 1. The CONTRACTOR may elect to replace a portion of the Portland cement with fly ash up to a maximum of 25 percent by weight of cement plus fly ash.
 - F. Admixtures:
 1. Air entraining admixture: Add at rate to achieve specified air content.
 - a. Do not use in slabs on grade scheduled to receive topping, unless manufacturer of topping recommends use over air entrained concrete.
 2. Water reducing and retarding admixture: Add as required in concrete mixes to be placed at ambient temperatures above 90 degrees F.
 3. Water reducing and accelerating admixture: Add as required in concrete mixes to be placed at ambient temperatures below 50 degrees F.
 4. High range water reducing admixture (superplasticizer): Add as required for placement and workability.
 5. Do not use admixtures not specified or approved.
 - G. Design mix to meet or exceed each requirement specified. Where more than one criterion is specified, the most stringent shall apply. For example, a minimum cement content or maximum water cement ratio might result in strengths greater than the minimum specified; likewise, a greater cement content or lower water cement ratio may be required in order to achieve the required strength.
 1. Specified compressive strength $f'(c)$ (ASTM C 39): As noted
 2. Maximum water cement ratio by weight:
 - a. 0.4 for concrete toppings subject to traffic
 - b. 0.45 for all other concrete
 3. Maximum slump: As recommended in ACI 211.1. and ACI 350 as applicable.
 4. Gradation of coarse aggregate: ASTM C 33 standard gradation with maximum nominal size of 3/4 inches.
 5. Total air content (ASTM C 173 or ASTM C 231): 5 percent.
 - H. Mix Adjustments: Provided that no additional expense to OWNER is involved,
- CAST-IN-PLACE CONCRETE

CONTRACTOR may submit for ENGINEER's approval requests for adjustment to approved concrete mixes when circumstances such as changed project conditions, weather, or unfavorable test results occur. Include laboratory test data substantiating specified properties with mix adjustment requests.

2.06 CONTROL OF MIX IN THE FIELD

- A. Slump: A tolerance of up to 1 inch above that specified will be permitted for 1 batch in 5 consecutive batches tested. Concrete of lower slump than that specified may be used, provided proper placing and consolidation is obtained.
 - 1. If slump upon arrival at the site is lower than 1 inch below the value specified, one addition of water in accordance with ASTM C 94 will be permitted to bring slump within tolerance, provided that:
 - a. A positive means is available to measure the amount of water added at the site.
 - b. The specified (or approved) maximum water cement ratio is not exceeded.
 - c. Not more than 45 minutes have elapsed since batching.
- B. Total Air Content: A tolerance of plus or minus 1 1/2 percent of that specified will be allowed for field measurements.
- C. Do not use batches that exceed tolerances.

2.07 CONCRETE MIXING

- A. On Site Equipment: Mix concrete materials in appropriate drum type batch machine mixer, in compliance with ASTM C 685. Mix each batch minimum of 1 1/2 minutes and maximum of 5 minutes before discharging concrete. Clean thoroughly at end of day and before changing concrete type.
- B. Transit Mixers: Mix concrete materials in transit mixers, complying with requirements of ASTM C 94.
 - 1. At ambient temperatures of 85 to 90 degrees F, reduce mixing and delivery time to 75 minutes.
 - 2. At ambient temperatures above 90 degrees F, reduce mixing and delivery time to 60 minutes.

PART 3- EXECUTION

3.01 CONCRETE FORM PREPARATION

- A. General: Comply with requirements of ACI 301 for formwork, and as herein specified. The CONTRACTOR is responsible for design, ENGINEER, and construction of formwork, and for its timely removal.
- B. Earth Forms: Hand trim bottoms and sides of earth forms to profiles indicated on the drawings. Remove loose dirt before placing concrete.
- C. Design: Design and fabricate forms for easy removal, without impact, shock, or damage to concrete surfaces or other portions of the work. Design to support all applied loads until concrete is adequately cured, within allowable tolerances and deflection limits.
- D. Construction: Construct and brace formwork to accurately achieve end results required by

contract documents, with all elements properly located and free of distortion. Provide for necessary openings, inserts, anchorages, and other features shown or otherwise required.

1. Joints: Minimize form joints and make watertight to prevent leakage of concrete.
 - a. Align joints symmetrically at exposed conditions.
 2. Chamfers: Provide chamfered edges and corners at exposed locations, unless specifically indicated otherwise on the drawings.
 3. Permanent openings: Provide openings to accommodate work of other trades, sized and located accurately. Securely support items built into forms; provide additional bracing at openings and discontinuities in formwork.
 4. Temporary openings: Provide temporary openings for cleaning and inspection in most inconspicuous locations at base of forms, closed with tight fitting panels designed to minimize appearance of joints in finished concrete work.
- E. Tolerances for Formed Surfaces: Comply with minimum tolerances established in ACI 117, unless more stringent requirements are indicated on the drawings.
- F. Release Agent: Provide either form materials with factory applied non-absorptive liner or field applied form coating. If field applied coating is employed, thoroughly clean and recondition formwork and reapply coating before each use. Rust on form surfaces is unacceptable.

3.02 VAPOR RETARDER INSTALLATION

- A. General: Place vapor retarder sheet over prepared base material, aligning longer dimension parallel to direction of pour and lapped 6 inches. Seal joints with appropriate tape.

3.03 PLACING REINFORCEMENT

- A. General: Comply with requirements of ACI 301 and as herein specified.
- B. Preparation: Clean reinforcement of loose rust and mill scale, soil, and other materials which adversely affect bond with concrete.
- C. Placement: Place reinforcement to achieve not less than minimum concrete coverages required for protection. Accurately position, support, and secure reinforcement against displacement. Provide Class C tension lap splices complying with ACI 318 unless otherwise indicated. Do not field bend partially embedded bars unless otherwise indicated or approved.
 1. Use approved bar supports and tie wire, as required. Set wire ties to avoid contact with or penetration of exposed concrete surfaces. Tack welding of reinforcing is not permitted.
 2. Wire fabric: Install in maximum lengths possible, lapping adjoining pieces not less than one full mesh. Offset end laps to prevent continuous laps in either direction, and splice laps with tie wire.
- D. Welding: Welding of reinforcement is not permitted.

3.04 JOINT CONSTRUCTION

- A. Construction Joints: Locate and install construction joints as indicated on drawings. If construction joints are not indicated, locate in manner which will not impair strength and will have least impact on appearance, as acceptable to the ENGINEER. Construction joints in retaining walls and walls of concrete tanks or structures subject to hydrostatic pressure

shall be intentionally roughened to a full amplitude of approximately ¼ inch.

1. Keyways: Provide keyways not less than 1 1/2 inches deep.
 2. Reinforcement: Continue reinforcement across and perpendicular to construction joints, unless details specifically indicate otherwise.
- B. Isolation Joints: Construct isolation joints in slabs poured on grade at points of contact with vertical components, such as foundation walls and column pedestals. Install expansion joint filler to full concrete depth. Recess top edge of filler 1/8 inch where joints are unsealed.
- C. Expansion Joints: Construct expansion joints where indicated. Install expansion joint filler to full depth of concrete. Recess edge of filler to depth indicated to receive joint sealant and backer rod as specified herein and detailed on drawings.
- D. Control Joints: Construct contraction joints in building slabs poured on grade to form panels of sizes indicated on drawings, but not more than 20 feet apart in either direction.
1. Saw cuts: Form control joints by means of saw cuts one fourth the depth of the slab, performed as soon as possible after slab finishing without dislodging aggregate.

3.05 INSTALLATION OF EMBEDDED ITEMS

- A. General: Set anchorage devices and other items required for other work connected to or supported by cast in place concrete, using templates, setting drawings, and instructions from suppliers of items to be embedded.
1. Edge Forms and Screeds: Set edge forms and intermediate screeds as necessary to achieve final elevations indicated for finished slab surfaces.

3.06 WATERSTOPS

- A. Waterstops shall be provided at all joints to seal off leakage of liquid from or into concrete tanks or structures subject to hydrostatic pressures. The type of waterstops used shall be as shown on the Drawings and as specified herein. The CONTRACTOR shall submit to the ENGINEER for approval the proposed procedure and schedule of concrete placing operations along with a detailed layout of the waterstop materials required showing sizes, lengths and types of joints.
- B. Where required for proper location of waterstops, whether shown on the Drawings or not, starter walls of up to 1-1/2 inches in height and monolithic with slabs shall be provided at all wall construction joints. Reinforcing steel shall not be depressed at waterstops but shall have only the amount of concrete covering shown or specified. Starter walls as specified shall be required whether shown on the Drawings or not, unless specified concrete cover over reinforcing steel is 3 inches or greater.

3.07 CONCRETE PLACEMENT

- A. Preparation: Provide materials necessary to ensure adequate protection of concrete during inclement weather before beginning installation of concrete.
- B. Inspection: Before beginning concrete placement, inspect formwork, reinforcing steel, and items to be embedded, verifying that all such work has been completed.
1. Wood forms: Moisten immediately before placing concrete in locations where form coatings are not used.

- C. Placement General: Comply with requirements of ACI 304 and as follows:
1. Concreting should be carried on at such a rate that the concrete is at all times plastic and flows readily into spaces between reinforcement.
 2. Schedule continuous placement of concrete to prevent the formation of cold joints.
 3. Provide construction joints if concrete for a particular element or component cannot be placed in a continuous operation.
 4. Deposit concrete as close as possible to its final location, to avoid segregation.
 5. Concrete shall be worked around reinforcement and embedded fixtures and into corners of forms.
 6. The following shall be prohibited from use:
 - a. Partially hardened concrete.
 - b. Contaminated concrete.
 - c. Re-tempered concrete.
 - d. Re-mixed concrete after initial set has occurred.
- D. Placement in Forms: Limit horizontal layers to depths which can be properly consolidated, but in no event greater than 24 inches.
1. Consolidate concrete by means of mechanical vibrators, inserted vertically in freshly placed concrete in a systematic pattern at close intervals. Penetrate previously placed concrete to ensure that separate concrete layers are knitted together.
 2. Vibrate concrete sufficiently to achieve consistent consolidation without segregation of coarse aggregates.
 3. Do not use vibrators to move concrete laterally.
- E. Slab Placement: Schedule continuous placement and consolidation of concrete within planned construction joints.
1. Thoroughly consolidate concrete without displacing reinforcement or embedded items, using internal vibrators, vibrating screeds, roller pipe screeds, or other means acceptable to ENGINEER.
 2. Strike off and level concrete slab surfaces, using highway straightedges, darbies, or bull floats before bleed water can collect on surface. Do not work concrete further until finishing operations are commenced.
- F. Cold Weather Placement: Comply with recommendations of ACI 306 when air temperatures are expected to drop below 40 degrees F either during concrete placement operations or before concrete has cured.
1. Do not use frozen or ice laden materials.
 2. Do not place concrete on frozen substrates.
- G. Hot Weather Placement: Comply with recommendations of ACI 305R when ambient temperature before, during, or after concrete placement is expected to exceed 90 degrees F or when combinations of high air temperature, low relative humidity, and wind speed are such that the rate of evaporation from freshly poured concrete would otherwise exceed 0.2 pounds per square foot per hour.
1. Do not add water to approved concrete mixes under hot weather conditions.
 2. Provide mixing water at lowest feasible temperature and provide adequate protection of poured concrete to reduce rate of evaporation.
 3. Use fog nozzle to cool formwork and reinforcing steel immediately prior to placing concrete.
- H. Mass Concrete Placement: Comply with recommendations of ACI 207.1R when any volume of concrete with dimensions large enough to require that measures be taken to cope with generation of heat from hydration of the cement and attendant volume change to

minimize cracking.

1. When the minimum dimension of the concrete exceeds 36 inches and the ratio of volume of concrete to the surface area is greater than 12 inches, provide for mass concrete.
2. Lifts shall not exceed 8ft.

3.08 FINISHING FORMED SURFACES

- A. Repairs, General: Repair surface defects, including tie holes, immediately after removing formwork.
 1. Remove honeycombed areas and other defective concrete down to sound concrete, cutting perpendicular to surface or slightly undercutting. Dampen patch location and area immediately surrounding it prior to applying bonding compound or patching mortar.
 2. Before bonding compound has dried, apply patching mixture matching original concrete in materials and mix except for omission of coarse aggregate, and using a blend of white and normal Portland cement as necessary to achieve color match. Consolidate thoroughly and strike off slightly higher than surrounding surface.
- B. Textured Form Finish: Repair tie holes and patch defective areas to match pattern created by form construction or form liners.
- C. Unexposed Form Finish: Repair tie holes and patch defective areas. Rub down or chip off fins or other raised areas exceeding ¼-inch height.
- D. Exposed Form Finish: Repair and patch defective areas, with fins or other projections completely removed and smoothed.
 1. Smooth rubbed finish: Apply to surfaces indicated no later than 24 hours after form removal.
 - a. Wet concrete surfaces to be finished and rub with Carborundum brick or other abrasive until uniform color and texture are achieved.
 - b. Do not apply separate grout mixture.
 2. Contiguous unformed surfaces: Strike smooth and float to a similar texture tops of walls, horizontal offsets, and other unformed surfaces adjacent to or contiguous with formed surfaces. Continue final finish of formed surfaces across unformed surfaces, unless otherwise specifically indicated.

3.09 FINISHING SLABS

- A. Finishing Operations
 1. Do not directly apply water to slab surface or dust with cement.
 2. Use hand or powered equipment only as recommended in ACI 302.1R.
 3. Screeding: Strike off to required grade and within surface tolerances indicated. Verify conformance to surface tolerances. Correct deficiencies while concrete is still plastic.
 4. Bull Floating: Immediately following screeding, bull float or darby before bleed water appears to eliminate ridges, fill in voids, and embed coarse aggregate. Recheck and correct surface tolerances.
 5. Do not perform subsequent finishing until excess moisture or bleed water has disappeared and concrete will support either foot pressure with less than ¼-inch indentation or weight of power floats without damaging flatness.
 6. Final floating: Float to embed coarse aggregate, to eliminate ridges, to compact concrete, to consolidate mortar at surface, and to achieve uniform, sandy texture. Recheck and correct surface tolerances.

- B. Coordinate appearance and texture of required final finishes with the ENGINEER before application.
 - 1. Apply final finishes in the locations indicated on the drawings.
- C. Float Finish: As specified above.
- D. Broomed Float Finish: After floating and when water sheen has practically disappeared, apply uniform transverse corrugations approximately 1/16-inch deep, without tearing surface.
- E. Slab Surface Tolerances:
 - 1. Achieve flat, level planes except where grades are indicated. Slope uniformly to drains.
 - 2. Floated finishes: Depressions between high spots shall not exceed 5/16 inch under a 10-foot straightedge.
- F. Repair of Slab Surfaces: Test slab surfaces for smoothness and to verify surface plane to tolerance specified. Repair defects as follows:
 - 1. High areas: Correct by grinding after concrete has cured for not less than 14 days.
 - 2. Low areas: Immediately after completion of surface finishing operations, cut out low areas and replace with fresh concrete. Finish repaired areas to blend with adjacent concrete. Proprietary patching compounds may be used when approved by the ENGINEER.
 - 3. Crazed or cracked areas: Cut out defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts. Dampen exposed concrete and apply bonding compound. Mix, place, compact, and finish patching concrete to match adjacent concrete.
 - 4. Isolated cracks and holes: Groove top of cracks and cut out holes not over 1 inch in diameter. Dampen cleaned concrete surfaces and apply bonding compound; place dry pack or proprietary repair compound acceptable to ENGINEER while bonding compound is still active:
 - a. Dry pack mix: One part Portland cement to 2-1/2 parts fine aggregate and enough water as required for handling and placing.
 - b. Install patching mixture and consolidate thoroughly, striking off level with and matching surrounding surface. Do not allow patched areas to dry out prematurely.

3.10 CONCRETE CURING AND PROTECTION

- A. General
 - 1. Prevent premature drying of freshly placed concrete and protect from excessively cold or hot temperatures until concrete has cured.
 - 2. Provide curing of concrete by one of the methods listed and as appropriate to service conditions and type of applied finish in each case.
- B. Curing Period
 - 1. Not less than 7 days for standard cements and mixes.
 - 2. Not less than 4 days for high early strength concrete using Type III cement.
- C. Curing Temperature
 - 1. Concrete shall be maintained above 50 degrees F and in moist condition during the

entire curing period.

- D. Formed Surfaces: Cure formed concrete surfaces by moist curing with forms in place for full curing period.
 - 1. Keep wooden or metal forms moist when exposed to heat of the sun.
 - 2. If forms are removed prior to completion of curing process, continue curing by one of the applicable methods specified.
- E. Surfaces Not in Contact with Forms
 - 1. Start initial curing as soon as free water has disappeared, but before surface is dry.
 - 2. Keep continuously moist for not less than 3 days by uninterrupted use of any of the following:
 - a. Water ponding.
 - b. Water saturated sand.
 - c. Water fog spray.
 - d. Saturated burlap: Provide 4-inch minimum overlap at joints.
 - 3. Begin final curing procedures immediately following initial curing and before concrete has dried.
 - a. Moisture retaining cover: Lap not less than 3-inches at edges and ends, and seal with waterproof tape or adhesive. Repair holes or tears during curing period with same tape or adhesive. Maintain covering in intimate contact with concrete surface. Secure to avoid displacement.
 - 1) Extend covering past slab edges at least twice the thickness of slab.
 - 2) Do not use plastic sheeting on surfaces which will be exposed to view when in service.
 - 3) Continue final curing to end of curing period.
- F. Avoid rapid drying at end of curing period.
- G. During and following curing period, protect concrete from temperature changes of adjacent air in excess of 5 degrees F per hour and 50 degrees F per 24 hours. Progressively adjust protective measures to provide uniform temperature changes over entire concrete surface.

3.11 SHORES AND SUPPORTS

- A. General: Comply with recommendations of ACI 347 for shoring and reshoring in multistory construction.
- B. Low Rise Construction: Extend shoring from ground to roof for structures 4 stories or less in height.
- C. Reshoring: Remove shores and reshore in a planned sequence, to avoid damage to partly cured concrete. Locate and provide adequate reshoring to safely support work without excessive stress or deflection.
- D. Provide as a package, shoring and reshoring drawings prepared by or under the direct supervision of a specialty ENGINEER registered in the State of Florida.

3.12 REMOVAL OF FORMS AND SUPPORTS

- A. Non Load Bearing Formwork: Provided that concrete has hardened sufficiently that it will not be damaged, forms not actually supporting weight of concrete or weight of soffit forms may be removed after concrete has cured at not less than 50 degrees F for 24 hours. Maintain curing and protection operations after form removal.
- B. Load Bearing Formwork: Do not remove shoring and forms supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, until concrete has attained at least the specified compressive strength $f'(c)$ and until the CONTRACTOR has determined that the actual compressive strength attained is adequate to support the weight of the concrete and superimposed loads.
- C. Keep reshores in place a minimum of 15 days after placing upper tier, and longer if required, until concrete has attained at least the specified compressive strength $f'(c)$ and until the CONTRACTOR has determined that the actual compressive strength attained is adequate to support the weight of the concrete and superimposed loads.
- D. Keep supports in place until heavy loads due to construction operations have been removed.
- E. Test field cured specimens to determine potential compressive strength of concrete for specific locations.

3.13 MISCELLANEOUS CONCRETE ITEMS

- A. Fill in: Fill in holes and openings left in concrete structures for passage of work by other trades after such work is in place. Place such fill in concrete to blend with existing construction, using same mix and curing methods.
- B. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as indicated on Drawings. Set anchor bolts at correct elevations, complying with diagrams or templates of equipment manufacturer.
 - 1. Grout base plates and foundations as indicated with non-shrink grout.
 - 2. Use nonmetallic grout for exposed conditions, unless otherwise indicated.
 - 3. Equipment bases shall be sized to provide a minimum of 1.5" between the edge of the equipment bases and the edge of the equipment being served.
 - 4. Provide conduit windows through equipment bases of electrical equipment sized no larger than the conduit windows of the equipment being served.
 - 5. Equipment bases for electrical equipment shall be a minimum of 4" thick with chamfered edges.
- C. Reinforced Masonry: Provide concrete grout for reinforced masonry where indicated on Drawings and as scheduled.

3.14 CONCRETE REPAIRS

- A. General: Repairs due to poor workmanship shall be made by the CONTRACTOR at the CONTRACTOR's expense and shall be approved by the ENGINEER prior to repair procedure being implicated.
- B. Perform cosmetic repairs of concrete surfaces as specified under concrete application.

- C. Perform structural repairs with prior approval of the ENGINEER for method and procedure, using epoxy bonding systems. The ENGINEER's approval is required for repair methods using materials other than those specified.

3.15 QUALITY CONTROL TESTING DURING CONSTRUCTION

- A. Refer to Section 01410 for additional concrete testing requirements for the project.
- B. Composite Sampling and Making and Curing of Specimens: ASTM C 172 and ASTM C 31.
 - 1. Take samples at point of discharge.
 - 2. For pumped concrete, perform sampling and testing at the frequencies specified herein at point of delivery to pump, and perform additional sampling and testing at the same frequency at discharge from line.
 - 3. Results obtained at discharge from line shall be used for acceptance of concrete.
- C. Slump: ASTM C 143. One test per strength test and additional tests if concrete consistency changes.
 - 1. Modify sampling to comply with ASTM C 94.
- D. Air Content of Normal Weight Concrete: ASTM C 173 or ASTM C 231. One test per strength test performed on air entrained concrete.
- E. Concrete Temperature:
 - 1. Test hourly when air temperature is 40 degrees F or below.
 - 2. Test hourly when air temperature is 90 degrees F or above.
 - 3. Test each time a set of strength test specimens is made.
- F. Compressive Strength Tests: ASTM C 39.
 - 1. Compression test specimens: Mold and cure one set of 4 standard cylinders for each compressive strength test required.
 - 2. Testing for acceptance of potential strength of as delivered concrete:
 - a. Obtain samples on a statistically sound, random basis.
 - b. Minimum frequency:
 - 1) One set per 100 cubic yards or fraction thereof for each day's pour of each concrete class.
 - 2) One set per 3500 square feet of slab or wall area or fraction thereof for each day's pour of each concrete class.
 - 3) When the above testing frequency would provide fewer than 5 strength tests for a given class of concrete during the project, conduct testing from not less than 5 randomly selected batches, or from each batch if fewer than 5.
 - c. Test one specimen per set at 7 days for information unless an earlier age is required.
 - d. Test 2 specimens per set for acceptance of strength potential; test at 28 days unless other age is specified. The test result shall be the average of the two specimens. If one specimen shows evidence of improper sampling, molding, or testing, the test result shall be the result of the remaining specimen; if both show such evidence, discard the test result and inform the ENGINEER.
 - e. Retain one specimen from each set for later testing, if required.
 - f. Strength potential of as delivered concrete will be considered acceptable if all of the following criteria are met:
 - 1) No individual test result falls below specified compressive strength by more than 500 psi.

- 2) Average of any 3 consecutive strength test results equals or exceeds specified compressive strength f_c .
 - 3) Testing for evaluation of field curing:
 - a) Frequency: 1 field set of specimens per strength acceptance test.
 - b) Mold specimens from same sample used for strength acceptance tests. Field cure, and test at same age as for strength acceptance tests.
 - c) Evaluate construction and curing procedures and implement corrective action when strength results for field cured specimens are less than 85 percent of test values for companion laboratory cured specimens.
 3. Removal of forms or supports: Mold additional specimens and field cure with concrete represented; test to determine strength of concrete at proposed time of form or support removal.
- G. Test Results: Testing agency shall report test results in writing to ENGINEER and CONTRACTOR within 24 hours of test.
1. Test reports shall contain the following data:
 - a. Project name, number, and other identification.
 - b. Name of concrete testing agency.
 - c. Date and time of sampling.
 - d. Concrete type and class.
 - e. Location of concrete batch in the completed work.
 - f. All information required by respective ASTM test methods.
 2. Nondestructive testing devices such as impact hammer or sonoscope may be used at ENGINEER's option for assistance in determining probable concrete strength at various locations or for selecting areas to be cored, but such tests shall not be the sole basis for acceptance or rejection.
 3. The testing agency shall make additional tests of in place concrete as directed by the ENGINEER when test results indicate that specified strength and other concrete characteristics have not been attained.
 - a. Testing agency may conduct tests of cored cylinders complying with ASTM C 42, or tests as directed.
 - b. Cost of additional testing shall be borne by the CONTRACTOR when unacceptable concrete has been verified.
- H. Water Tightness of Water Containing Walls
1. All basins, tanks, manholes, storm drainage structures, and wet wells are hydraulic structures and shall be watertight. Water tightness testing shall be conducted prior to any application of coatings or painting systems to the tank, basin, manhole, or wet well as per Sections 09900 and 13216. Each structure shall be filled with water, full depth (above maximum water level), prior to backfilling (unless otherwise noted) and kept full of water for 48 hours prior to starting the tightness testing. After 48-hours the level in the tank shall be measured and the testing period shall begin and conducted over a 24-hour period. The CONTRACTOR shall exercise every precaution to secure water tightness by careful mixing and placing of the concrete to obtain a homogeneous mixture at maximum density, without air pockets or voids, using the minimum practical amount of water in the mix. Extreme care shall be used to secure continuity of water stops at expansion and construction joints, to seal off holes from wall ties, and when placing concrete about wall sleeves, wall pipes and other obstructions. The CONTRACTOR shall fix all leaks.
 2. The CONTRACTOR shall furnish, at his own expense, any pumps, piping, and appurtenances to provide the test water for the water tightness testing and any water

3. post-loading operations of structures.
All structures shall be watertight.

END OF SECTION 03300

DIVISION 04 MASONRY

SECTION 04230 - REINFORCED UNIT MASONRY

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This Section includes unit masonry assemblies that shall be provided as necessary to construct the new buildings as part of this project. Items included in this section are:
 - 1. Decorative concrete masonry units (Split faced and smooth faced, colored CMU)
 - 2. Mortar and grout
 - 3. Reinforcing steel
 - 4. Masonry joint reinforcement
 - 5. Ties and anchors
 - 6. Miscellaneous masonry accessories
- B. Products furnished, but not installed, under this Section include the following:
 - 1. Anchor sections of adjustable masonry anchors for connecting to structural frame, installed under Division 5 Section "Structural Steel."
- C. Products installed, but not furnished, under this Section include the following:
 - 1. Steel lintels and shelf angles for unit masonry, furnished under Division 5 Section "Metal Fabrications."

1.03 DEFINITIONS

- A. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.04 SUBMITTALS

- A. Provide submittals in accordance with Section 01300.
- B. Product Data: For each type of product indicated.
- C. Shop Drawings: For the following:
 - 1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."
- D. Samples for Initial Selection: For the following:
 - 1. Decorative concrete masonry units, in the form of small-scale units.
 - 2. Colored mortar.
 - 3. Weep holes/vents.
- E. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.

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.
- F. Material Certificates: Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards. Provide for each type and size of the following:
 1. Masonry units.
 - a. Include material test reports substantiating compliance with requirements.
 2. Cementitious materials. Include brand, type, and name of manufacturer.
 3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
 4. Grout mixes. Include description of type and proportions of ingredients.
 5. Reinforcing bars.
 6. Joint reinforcement.
 7. Anchors, ties, and metal accessories.
- G. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 1. Include test reports, per ASTM C 780, for mortar mixes required to comply with property specification.
 2. Include test reports, per ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
- H. Cold-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with cold-weather requirements.

1.05 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1093 for testing indicated, as documented according to ASTM E 548.
- B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.
- C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from a single manufacturer for each cementitious component and from one source or producer for each aggregate.
- D. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by other means, as acceptable to authorities having jurisdiction.
- E. 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 full mockup of typical wall area as shown on Drawings.
 2. Build mockups for typical exterior wall in sizes approximately 48 inches wide and 60 inches high by full thickness, including face and backup wythes and accessories.
 - a. Include a sealant-filled joint at least 16 inches long in each exterior wall mockup.
 - b. Include lower corner of window opening at upper corner of exterior wall mockup. Make opening approximately 12 inches wide by 16 inches high.

- c. Include through-wall flashing installed for a 24-inch length in corner of exterior wall mockup approximately 16 inches down from top of mockup, with a 12-inch length of flashing left exposed to view (omit masonry above half of flashing).
 3. Clean one-half of exposed faces of mockups with masonry cleaner as indicated.
 4. Protect accepted mockups from the elements with weather-resistant membrane.
 5. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
 - a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
 - b. 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.
 - c. Mock ups must be approved the the Architect and OWNER prior to beginning construction of any building.
- F. Preinstallation Conference: Conduct conference at Project site to discuss masonry and building construction requirements. Pay special attention to anchoring of door and window frames, providing necessary blocking, and the use of the correct anchor attachments that are provided with all opening frames including but not limited to windows, doors and louvers.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry. Keeping units dry while stored as well as while being laid is very important to the prevention of efflorescence. Make every effort to keep cmu units dry at all times.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.07 PROJECT CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work or in the event of rain during a days work. Cover partially completed masonry when construction is not in progress.
 1. Extend cover a minimum of 24 inches down both sides and anchor cover securely in place. Be advised this aspect of the construction process will be closely monitored.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.

- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
 - 5. Remove any and all stained or damaged blocks that cannot be cleaned.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
 - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.
- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

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

2.02 MASONRY UNITS, GENERAL

- A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to exceed tolerances and to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects, including dimensions that vary from specified dimensions by more than stated tolerances, will be exposed in the completed Work or will impair the quality of completed masonry.

2.03 CONCRETE MASONRY UNITS (CMUs)

- A. Shapes: Provide shapes indicated and as follows:
 - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
 - 2. Provide square-edged units for outside corners, unless otherwise indicated.
 - 3. All units to be manufactured with moisture inhibitors. Design basis for moisture inhibitor is the Dry-Block System.
- B. Decorative Concrete Masonry Units: ASTM C 90.
 - 1. Weight Classification: Normal weight.
 - 2. Pattern and Texture:

- a. Standard pattern, smooth and split face finish, intergrally colored CMU with moisture inhibitors. Final block color shall be selected by OWNER, JEA.
3. Size (Width): Manufactured to the following dimensions:
 - a. 8 inches nominal; 7-5/8 inches actual.
 - b. 12 inches nominal; 11-5/8 inches actual.
4. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.
 - a. Where units are to be left exposed, provide color and texture matching the range represented by Architect's sample and as indicated on the drawings.
 - b. All units to be manufactured with moisture inhibitors. Design basis for moisture inhibitor is the Dry-Block System.

2.04 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207, Type S.
- D. Colored Cement Product: Packaged blend made from portland cement and lime and mortar pigments, all complying with specified requirements, and containing no other ingredients.
 1. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.
 - a. Color for colored, split faced CMU. Refer to the Drawings for the colors.
 2. Pigments shall not exceed 10 percent of portland cement by weight.
 3. Available Products:
 - a. Colored Portland Cement-Lime Mix:
 - 1) Capital Materials Corporation; Riverton Portland Cement Lime Custom Color.
 - 2) Holcim (US) Inc.; Rainbow Mortamix Custom Color Cement/Lime.
 - 3) Lafarge North America Inc.; Eaglebond.
 - 4) Lehigh Cement Company; Lehigh Custom Color Portland/Lime Cement.
- E. Aggregate for Mortar: ASTM C 144.
 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
- F. Aggregate for Grout: ASTM C 404.
- G. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
 1. Available Products:
 - a. Addiment Incorporated; Mortar Kick.
 - b. Grace Construction Products, a unit of W. R. Grace & Co. - Conn.; Morset.
 - c. Sonneborn, Div. of ChemRex; Trimix-NCA.
- H. Water: Potable.
- I. Mortar shall have moisture inhibitors.

- J. Mortar Joints to be concave struck. Make every effort to produce a dry joint to defeat the passage of water. Design basis for the mortar moisture inhibitor is the Dry-Block II Mortar Admixture System.

2.05 REINFORCEMENT

- A. Masonry Joint Reinforcement, General: ASTM A 951.
 - 1. Interior Walls: Hot-dip galvanized, carbon steel.
 - 2. Exterior Walls: Hot-dip galvanized, carbon steel.
 - 3. Wire Size for Side Rods: W1.7 or 0.148-inch diameter.
 - 4. Wire Size for Cross Rods: W1.7 or 0.148-inch diameter.
 - 5. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
 - 6. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.
- B. Masonry Joint Reinforcement for Single-Wythe Masonry: Either ladder or truss type with single pair of side rods.

2.06 TIES AND ANCHORS

- A. Materials: Provide ties and anchors specified in subsequent paragraphs that are made from materials that comply with subparagraphs below, unless otherwise indicated.
 - 1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82; with ASTM A 153/A 153M, Class B-2 coating.

2.07 MISCELLANEOUS ANCHORS

- A. Post installed Anchors: Provide chemical or torque-controlled expansion anchors, with capability to sustain, without failure, a load equal to six times the load imposed when installed in solid or grouted unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
 - 1. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (5 microns) for Class SC 1 service condition (mild).
 - 2. Corrosion Protection: Stainless-steel components complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Alloy Group 1 or 4) for bolts and nuts; ASTM A 666 or ASTM A 276, Type 304 or 316, for anchors.

2.08 MISCELLANEOUS MASONRY ACCESSORIES

- A. Mesh Weep/Vent: Free-draining mesh; made from polyethylene strands, full height and width of head joint and depth 1/8 inch less than depth of outer wythe; in color selected from manufacturer's standard.
 - 1. Available Products:
 - a. Mortar Net USA, Ltd.; Mortar Net Weep Vents.
 - 2. Provide weeps at wall bases, opening sills, heads and other obstructions to downward movement of water. Provide thru wall flashing at each weep location. Weeps shall be at 2-ft-8-inch O.C. horizontally.

2.09 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly

approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. Available Manufacturers:
 - a. Diedrich Technologies, Inc.
 - b. EaCo Chem, Inc.
 - c. ProSoCo, Inc.

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.
 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
 2. Verify that foundations are within tolerances specified.
 3. Verify that reinforcing dowels are properly placed.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION, GENERAL

- A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.
- B. Build chases and recesses to accommodate items specified in this and other Sections.
- C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- D. Use full-size units without cutting if possible. The intent of the drawings is to build to masonry dimensions without cutting. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.
 1. Mix units from several pallets or cubes as they are placed.
- F. Comply with construction tolerances in ACI 530.1/ASCE 6/TMS 602 and with the following:
 1. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
 2. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
 3. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
 4. For exposed bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch. Do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.

5. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.
6. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.
7. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

3.03 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond and bond pattern indicated on Drawings; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4-inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet CMU if required before laying fresh masonry.
- E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- F. Fill space between steel frames and masonry solidly with mortar, unless otherwise indicated.
- G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.
- H. Fill cores in hollow concrete masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.
- I. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated.
 1. Install compressible filler in joint between top of partition and underside of structure above.
 2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch clearance between end of anchor rod and end of tube. Space anchors 48 inches o.c., unless otherwise indicated.
 3. Wedge non-load-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
 4. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Division 7 Section "Fire-Resistive Joint Systems" as applicable.

3.04 MORTAR BEDDING AND JOINTING

- A. Lay concrete masonry units as follows:
 - 1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
 - 2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
 - 3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
 - 4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.
- B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.
- D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint), unless otherwise indicated.

3.05 MASONRY JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
 - 1. Space reinforcement not more than 16 inches o.c.
 - 2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.
 - 3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings.
 - a. Reinforcement above is in addition to continuous reinforcement.
- B. Interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.
- E. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.06 CONTROL AND EXPANSION JOINTS

- A. General: Install control and expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form control joints in concrete masonry as follows:
 - 1. Install temporary foam-plastic filler in head joints and remove filler when unit masonry is complete for application of sealant.
- C. Install expansion or control joints maximum of 24-ft-0-inch O.C. in exterior CMU.

3.07 LINTELS

- A. Install steel lintels where indicated.
- B. Provide minimum bearing of 16 inches at each jamb, unless otherwise indicated.

3.08 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.
- B. Install flashing as follows, unless otherwise indicated:
 - 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
 - 2. At all exterior masonry walls, use “Blockflash” pan with connection bridge single wythe flashing weep system.
 - 3. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
 - 4. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.
- C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.
- D. Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:
 - 1. Use specified weep/vent products to form weep holes.
 - 2. Space weep holes 32 inches o.c., unless otherwise indicated.

3.09 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
 - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
 - 1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
 - 2. Limit height of vertical grout pours to not more than 60 inches.

3.10 FIELD QUALITY CONTROL

- A. Inspectors: OWNER will engage qualified independent inspectors to perform inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform inspections.
 - 1. Place grout only after inspectors have verified compliance of grout spaces and grades, sizes, and locations of reinforcement.

3.11 PARGING

- A. Parge exterior faces of below-grade masonry walls, where indicated, in 2 uniform coats to a total thickness of 3/4 inch. Dampen wall before applying first coat and scarify first coat to ensure full bond to subsequent coat.
- B. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8 inch per foot. Form a wash at top of parging and a cove at bottom.
- C. Damp-cure parging for at least 24 hours and protect parging until cured.

3.12 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
 - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
 - 5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
 - 6. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

3.13 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

- B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
 - 1. Crush masonry waste to less than 4 inches in each dimension.
 - 2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Division 2 Section "Earthwork."
 - 3. Do not dispose of masonry waste as fill within 18 inches of finished grade.
- C. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off OWNER's property.

3.14 CONCRETE MASONRY UNIT SCHEDULE

- A. Reference architectural drawings for locations of CMU types and elevations; match exposed face of lintel CMUs with CMU of wall. CMU shall be as manufactured by "Best Block LLC." Final integrally colored CMU shall be selected by the OWNER, JEA.
- B. Interior walls of CMU shall be standard grey stretcher in widths indicated on floor plans.

END OF SECTION 04230

DIVISION 05 METALS

SECTION 05120 - STRUCTURAL STEEL

PART 1-GENERAL

1.01 SUMMARY

- A. Description of scope and intent:
1. CONTRACTOR shall provide all material, labor, and tools required to complete the installation of specified system.
 2. Any omission of reference to items required to complete the full operational and functional system specified in the section does not relieve the CONTRACTOR of the obligation to provide same.
 3. To provide installation of all items, including delivery, dispersing to the proper locations within the building, and affixing in place.
 4. Installation shall be accomplished by workers skilled in their craft who will perform their work in a professional manner and will leave the premises safe, orderly and clean.
 5. Drawings and general provisions of Contract, including General and Supplemental Conditions and Division 1 Specification Sections, apply to this Section.
 6. CONTRACTOR is responsible for coordination of work included in this specification with all other specification sections related to furnishing of all materials, labor, permits, fees and services necessary for completion of work in this Section.
 7. In the event of a conflict between the Design Drawings, referenced standards and these Specifications, the more stringent shall govern unless directed otherwise by the ENGINEER. CONTRACTOR shall strictly adhere to OSHA requirements and local codes or those of any regulatory agency or body with jurisdiction.
- B. Section Includes:
1. Fabrication and erection of structural steel framing members, as defined in AISC Code and as indicated on the drawings.
 2. Fabrication and erection of architecturally exposed structural steel (AESS).
 3. Welding.
 4. Shop painting.
- C. Products furnished but not installed under this section:
1. Steel anchorages cast in concrete.
 2. Steel anchorages embedded in masonry.

1.02 REFERENCES

Comply with the following documents, except where requirements of the Contract Documents or of governing codes and governing authorities are more stringent. All referenced standards refer to the edition in force at the time these plans and specifications are issued.

- A. ASTM A 36 -- Standard Specification for Structural Steel
- B. ASTM A 6 – General Requirements for Rolled Steel Plates, Shapes, Sheet Piling, and

Bars for Structural Use

- C. ASTM A 123 -- Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- D. ASTM A 307-- Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
- E. ASTM A 325-- Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
- F. ASTM A 500-- Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
- G. ASTM A 786 – Rolled Steel Floor Plates
- H. ASTM A 992 – Specification for Structural Steel Shapes
- I. ASTM C 1107-- Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
- J. ASTM E 94 -- Standard Guide for Radiographic Testing
- K. ASTM E 142-- Standard Method for Controlling Quality of Radiographic Testing
- L. ASTM E 164-- Standard Practice for Ultrasonic Contact Examination of Weldments
- M. ASTM E 165-- Standard Test Method for Liquid Penetrant Examination
- N. ASTM E 709-- Standard Guide for Magnetic Particle Examination
- O. ASTM F 959-- Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners
- P. AWS D1.1-- Structural Welding Code - Steel; American Welding Society
- Q. Code of Standard Practice for Steel Buildings and Bridges; American Institute of Steel Construction, Inc. (AISC)
- R. Specification for Structural Steel Buildings -- Allowable Stress Design and Plastic Design; American Institute of Steel Construction, Inc. (AISC)
- S. Specification for Structural Joints Using ASTM A325 or A490 Bolts; Research Council on Structural Connections; American Institute of Steel Construction, Inc. (AISC)
- T. Steel Structures Painting Manual, Volume 2, Systems and Specifications; Steel Structures Painting Council (SSPC)

1.03 DEFINITIONS

- A. Structural Steel: Items as listed in 2.1 of AISC "Code of Standard Practice for Steel Buildings and Bridges," and excluding steel, iron, or other metal items not listed, even if attached to the structural framing.

1.04 SYSTEM DESCRIPTION

- A. General: Unless otherwise specifically approved in writing, furnish exact sections, weights, and kinds of material specified, using details and dimensions shown.
 - 1. Not all connections are detailed; similar details apply to similar conditions, unless otherwise indicated. Contact the Architect promptly to verify design of members or connections in any situation where design requirements are unclear.

1.05 SUBMITTALS

- A. Provide submittals in accordance with Section 01300.
- B. Product Data: Producer's or manufacturer's information for products as follows, including sufficient data to show compliance with specified requirements:
 - 1. Mill test reports for each type of structural steel furnished.
 - 2. Test reports for high-strength bolts, nuts, and washers, including chemical analysis, tensile strength tests, and hardness tests.
 - 3. Test reports for direct tension indicators.
 - 4. Specifications for primer paint, including manufacturer's data on chemical composition, adhesion of spray fireproofing, and dry film thickness per applied coat.
 - 5. Specifications for non-shrink grout.
- C. Shop Drawings: Complete drawings for structural steel, including information on location, type, and size of all connections, distinguishing between those made in the shop and those made in the field.
 - 1. Indicate weld lengths and sizes, using standard American Welding Society (AWS) welding symbols.
 - 2. Include setting drawings and templates for anchorages to be installed by others.
 - 3. Prepare shop drawings under the seal of a professional structural ENGINEER registered in the state of Florida.
 - 4. The fabricator is specifically responsible for the adequacy of any connections designed by the fabricator to performance standards established in the contract documents. Approval by the ENGINEER of shop drawings shall not relieve the fabricator of this responsibility, despite wording to the contrary in paragraph 4.2.1 of the AISC Code.
- D. Test Reports: Submit test reports for all specified tests of connections.
- E. Welder Qualifications: Evidence that welders employed in the work are currently certified under American Welding Society (AWS) qualification procedures.
- F. Surveys: Certified copies of specified surveys, showing locations of all critical elements and deviations from data shown on Contract documents.

1.06 QUALITY ASSURANCE

- A. Welding Procedures: Establish that joint welding procedures are prequalified or test in accordance with American Welding Society (AWS) qualification procedures.
- B. Regulatory Requirements: Unless other requirements of governing authorities or particular requirements of this specification are more stringent, comply with provisions of the following:
 - 1. AISC "Code of Standard Practice for Steel Buildings and Bridges."
 - 2. AISC "Specification for Structural Steel Buildings -- Allowable Stress Design and Plastic Design," with Commentary and Supplements.
 - 3. AWS D1.1, "Structural Welding Code - Steel."
- C. Testing and Inspection Agency: Engage an independent testing and inspection agency acceptable to the OWNER to perform testing, inspect and evaluate connections, and prepare test reports.
 - 1. Correct deficiencies in the structural steel work identified by the testing and inspection agency at no additional expense to the OWNER. Subsequent tests to confirm the adequacy of corrected work will be at the CONTRACTOR's expense.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Shipping: Deliver steel in timely fashion, to permit the most efficient and economical flow of work. Deliver steel members properly marked for field assembly and erection.
 - 1. Deliver anchor bolts, washers, and other anchorage devices to be built into other work in time to avoid delays and permit their proper installation.
- B. Storage: Protect steel and other materials of this section from damage and corrosion. If temporary storage at the project site is required, keep steel members off the ground, using platforms or pallets, in location easily accessible for inspection.

PART 2- PRODUCTS

2.01 STEEL MATERIALS

- A. AESS Materials - General: For members which will be exposed in the finished work and have been identified as AESS on the drawings, provide only materials which are free of surface blemishes such as pitting, roller marks, rolled trade names, and surface roughness.
- B. Structural Steel Members (refer to plans for locations indicated):
 - 1. Wide flanges and WT sections: ASTM A992, Fy=50 ksi
 - 2. Channels, angles, plates, and miscellaneous steel: ASTM A36, Fy=36 ksi
 - 3. 316 Stainless Steel: ASTM A484, ASTM A276, Fy=30 ksi
 - 4. Structural Tubing, Cold-Formed: ASTM A500, Fy=46 ksi
 - 5. Steel Pipe: ASTM A53, Type E or S, Grade B, Fy=35 ksi
- C. Anchor Bolts: ASTM F1554, Carbon steel, Grade 36; ASTM A 36 steel plate washers.

- D. Bolts and Nuts:
 - 1. Carbon Steel: ASTM A307, Grade A
 - 2. High Strength Steel: ASTM A325, Type 1, plain (medium carbon steel)
 - 3. Stainless Steel: ASTM F593, ASTM F594
 - 4. AESS: Provide hexagonal bolt heads and nuts at all exposed connections.
- E. Hardened Washers: ASTM F436, ASTM A240 (for stainless)
 - 1. Dimensional requirements shall meet ANSI B18.22.1, Type A plain.
- F. Direct Tension Indicators: At CONTRACTOR's option, provide either load indicator washers complying with ASTM F 959 or snap-off high-strength bolts certified to provide the minimum fastener tension in accordance with AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts" at all connections requiring high-strength bolts.
- G. Shear Connectors: ASTM A108, Grades 1010 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1, Type B. Minimum Yield Strength = 50 ksi. Test Shear connectors in accordance with AWS. All studs shall be a minimum 3/4" diameter unless otherwise noted.

2.02 MISCELLANEOUS MATERIALS

- A. Welding Electrodes and Fluxes: AWS D1.1, Types as follows:
 - 1. E70XX.
- B. Nonshrink Grout: Prepackaged material requiring only the addition of water and complying with ASTM C 1107, and as follows:
 - 1. Natural aggregate (nonmetallic) type.
 - 2. Products: The following products, provided they comply with requirements of the contract documents, will be among those considered acceptable:
 - a. "Masterflow 928"; Master Builders, Inc.
 - b. "SonogROUT 14k"; Sonneborn Building Products Division/ChemRex, Inc.
 - c. "Euco N-S Grout"; The Euclid Chemical Company.
 - d. "Supreme"; Cormix Construction Chemicals.
 - e. "Five Star Grout"; Five Star Products, Inc.
- C. Shop Primer: Fabricator's standard primer.

2.03 FABRICATION

- A. Shop Assembly - General: Comply with requirements of AISC Specifications. Shop fabricate and assemble to maximum degree possible.
 - 1. AESS: Comply with requirements of AISC Code for architecturally exposed structural steel.
 - a. Appearance: Cut, fit, and assemble units with exposed surfaces smooth, square, and free from cutting marks, shear distortion, burrs, and nicks.
 - b. Tolerances: As specified in AISC Code for AESS, unless more stringent requirements are indicated on the drawings.

- B. Thermal Cutting: Perform all thermal cutting by machine.
 - 1. Plane thermally cut edges which are to be welded.

- C. Connections
 - 1. Shop connections: As indicated on the drawings.
 - 2. Field connections: As indicated on the drawings.
 - 3. Bolts: High-strength steel bolts, except as otherwise indicated.
 - a. Bolting: Comply with requirements of AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts."
 - 4. Welds: Comply with requirements of AWS Code for welding procedures and quality of welds, including appearance.
 - a. Built-up sections: Assemble components and weld using procedures which will maintain proper alignment of finished section.
 - b. AESS: Verify that weld sizes, fabrication sequence, and equipment to be employed will limit distortions to allowable tolerances. Surface bleed of back-side welding on exposed surfaces will not be acceptable.
 - 1) Grind smooth exposed fillet welds 1/2 inch and larger.
 - 2) Grind flush butt welds.
 - 3) Dress all exposed welds.

- D. Finishing: Accurately mill ends of columns and other members which must transmit loads in bearing.

- E. Holes in Steel Members: Make all holes by means of cutting, drilling, or punching at right angles to surface of metal. Do not make or enlarge holes by burning.
 - 1. Provide holes in steel members as required to permit connection of work by others.

2.04 SHOP COATING – GALVANIZING

- A. Galvanize the following items:
 - 1. All structural steel exposed to weather and as indicated on drawings.

- B. Preparation: Thoroughly clean members to be galvanized, removing loose rust and mill scale.

- C. Galvanizing: Perform galvanizing after fabrication in accordance with requirements of ASTM A 123, except galvanize all fastener assemblies in accordance with ASTM A153, use galvanizing methods which provide surface suitable for painting with min class A slip coefficient (0.33).

2.05 SHOP COATING – PAINT

- A. Shop prime all steel members, except:
 - 1. Galvanized steel members.
 - 2. Steel members embedded in concrete or mortar.
 - 3. Do not paint the following surfaces:
 - a. Machined or milled surfaces.
 - b. Surfaces adjacent to field welds.
 - c. Faying surfaces of bolted connections.
 - d. Portions of member that receive a special coating. Refer to Section 09900.

- B. Preparation: Thoroughly clean steel surfaces to be shop primed, removing loose rust, loose mill scale, dirt, oil, and grease. Clean steel in accordance with SSPC procedures as follows:
 - 1. Power tool or blast cleaning: SSPC SP-3, -5, -6, or -10.
- C. Painting: As soon as possible after cleaning, apply specified paint coating, refer to Section 09900 for coatings. Apply coatings in accordance with instructions of paint manufacturer. Apply coatings at a rate sufficient to provide a finished thickness to meet the requirements of Section 09900.

2.06 SHOP QUALITY CONTROL

- A. Testing and Inspection:
 - 1. General: Provide access to testing and inspection agency so that specified testing and inspection can be safely accomplished.
 - 2. Shop bolted connections: Comply with testing and verification procedures in AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts," except test not less than the following number of bolts in each bolted connection:
All slip critical connections as noted SC on drawings.
 - 3. Shop welded connections: Inspect and test shop-fabricated welds as follows:
 - a. Visually inspect all welds.
 - b. Inspect 100. percent of full penetration welds, using test method as follows:
 - 1) Radiographic testing (ASTM E 94 and ASTM E 142).
 - c. Inspect 20 percent of fillet welds, using one of the following test methods:
 - 1) Radiographic Testing (ASTM E 94 and ASTM E 142).
 - 2) Magnetic Particle Inspection (ASTM E 709).
 - 3) Ultrasonic Testing (ASTM E 164).
 - 4) Liquid Penetrant Inspection (ASTM E 165).

PART 3- EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Examine areas and conditions for erection of structural steel and verify that the work may properly proceed. Do not commence erection of structural steel until unsatisfactory conditions have been corrected or fabricated steel components have been adjusted with the architect's agreement.
 - 1. Surveys: Conduct verification surveys by a professional ENGINEER or land surveyor registered in the state of Florida.

3.02 PREPARATION

- A. Temporary Support: Provide temporary guys, braces, falsework, cribbing, or other elements required to secure the steel framing against loads equal in intensity to design loads. Remove such temporary support only when permanent connections have been made and the steel framing is fully capable of supporting design loads, including any temporary construction loads.

3.03 ERECTION

- A. General: Erect structural steel in compliance with AISC Code of Standard Practice and Specifications.
 - 1. AESS: Comply with erection requirements of AISC Code dealing with architecturally exposed structural steel.
- B. Assembly:
 - 1. Set structural members accurately to locations and elevations indicated, within tolerances established in AISC Code, before making final connections.
 - 2. Do not use thermal cutting to correct fabrication errors on any major structural member.
 - a. Thermal cutting of secondary members may be permitted by the architect upon request, but only when members involved are not loaded.
- C. Columns and Bearing Surfaces:
 - 1. Clean bearing and contact surfaces before assembly. Slightly roughen concrete and masonry surfaces to improve bond.
 - 2. Set base and bearing plates accurately, using metal wedges, shims, or setting nuts as required.
 - 3. After tightening anchor bolts and ensuring that structure is plumb, grout solidly between plates and bearing surfaces.
 - a. Comply with manufacturer's instructions for nonshrink grout.
- D. Bolting:
 - 1. Carbon steel bolts: Use only for temporary bracing during erection, unless otherwise specifically permitted by contract documents.
 - 2. High-strength bolts: Comply with requirements of AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts."
- E. Welding:
 - 1. Do not perform field welding when ambient temperature is at 0 degrees F or below, or when surfaces are wet, exposed to rain, snow, or high wind.
 - 2. Perform field welding in accordance with AWS "Structural Welding Code - Steel."
 - 3. Tighten and leave in place erection bolts used in field-welded construction.
 - a. AESS: Verify that weld sizes, erection sequence, and equipment to be employed will limit distortions to allowable tolerances. Surface bleed of back-side welding on exposed surfaces is not acceptable.
 - 1) Grind smooth exposed fillet welds 1/2 inch and larger.
 - 2) Grind flush butt welds.
 - 3) Dress all exposed welds.
 - 4) Remove erection bolts, plug-weld bolt holes, and grind smooth.
- F. Touch-up Painting: As soon as possible after erection of primed structural steel, clean painted areas which have been abraded or otherwise damaged by welding, bolting, or other field operations. Apply touch-up paint matching shop coating by brush or spray to all damaged paint areas, achieving a minimum final thickness of 1.5 mils.

3.04 FIELD QUALITY CONTROL

- A. Testing and Inspection:
 - 1. General: Provide access to testing and inspection agency so that specified testing and inspection can be safely accomplished.
 - 2. Field-bolted connections: Comply with testing and verification procedures in AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts," except test not less than the following number of bolts in each bolted connection: All slip critical connections as noted "SC" on the drawings.
 - 3. Field-welded connections: Inspect and test field-fabricated welds as follows:
 - a. Visually inspect all field welds.

END OF SECTION 05120

GENERAL SECTION 05500 - METAL FABRICATIONS

PART 1 - GENERAL

1.01 SUMMARY

- A. Description of scope and intent:
 - 1. CONTRACTOR shall provide all material, labor, and tools required to complete the installation of specified system.
 - 2. Any omission of reference to items required to complete the full operational and functional system specified in the section does not relieve the CONTRACTOR of the obligation to provide same.
 - 3. To provide installation of all items, including delivery, dispersing to the proper locations within the building, and affixing in place.
 - 4. Installation shall be accomplished by workers skilled in their craft that will perform their work in a professional manner and will leave the premises safe, orderly and clean.
 - 5. Drawings and general provisions of Contract, including JEA Conditions and Division 1 Specification Sections, apply to this Section
 - 6. CONTRACTOR is responsible for coordination of work included in this specification with all other specification sections related to furnishing of all materials, labor, permits, fees and services necessary for completion of work in this section.
 - 7. In the event of a conflict between the design drawings, referenced standards and these Specifications, the more stringent shall govern unless directed otherwise by the Architect. CONTRACTOR shall strictly adhere to OSHA requirements and local codes or those of any regulatory agency or body with jurisdiction
- B. This Section includes the following:
 - 1. Steel framing and supports for applications where framing and supports are not specified in other Specification Sections or on the Structural Drawings.

1.02 SUBMITTALS

- A. Provide submittals in accordance with Section 01300.
- B. Shop Drawings: Detail fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
 - 1. Provide templates for anchors and bolts specified for installation under other Sections.
- C. Welding Certificates: Copies of certificates for welding procedures and personnel.

1.03 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm experienced in producing metal fabrications 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.
- B. Welding: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1, "Structural Welding Code--Steel."
 - 2. AWS D1.3, "Structural Welding Code--Sheet Steel."
 - 3. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

1.04 PROJECT CONDITIONS

- A. Field Measurements: Where metal fabrications are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1.Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Allow for trimming and fitting.

1.05 COORDINATION

- A. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.01 METALS, GENERAL

- A. Metal Surfaces, General: For metal fabrications exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

2.02 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Malleable-Iron Castings: ASTM A 47, Grade 32510.
- C. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

2.03 PAINT

- A. Shop Primer for Ferrous Metal: Fast-curing, lead and chromate free, universal modified-alkyd primer complying with performance requirements in FS TT-P-664; selected for good resistance to normal atmospheric corrosion, compatibility with finish paint systems indicated, and capability to provide a sound foundation for field-applied topcoats despite prolonged exposure.
- B. Galvanizing Repair Paint: High-zinc-dust-content paint for re-galvanizing welds in steel, complying with SSPC-Paint 20.

2.04 FASTENERS

- A. General: Provide Type 304 or 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, where built into exterior walls. Select fasteners for type, grade, and class required.
- B. Anchor Bolts: ASTM F 1554, Grade 36.

- C. Machine Screws: ASME B18.6.3.
- D. Lag Bolts: ASME B18.2.1.
- E. Wood Screws: Flat head, carbon steel, ASME B18.6.1.
- F. Plain Washers: Round, carbon steel, ASME B18.22.1.
- G. Lock Washers: Helical, spring type, carbon steel, ASME B18.21.1.
- H. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
 - 1. Material: Carbon-steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.
- I. Toggle Bolts: FS FF-B-588, tumble-wing type, class and style as needed.

2.05 GROUT

- A. Nonshrink, Metallic Grout: Factory-packaged, ferrous-aggregate grout complying with ASTM C 1107, specifically recommended by manufacturer for heavy-duty loading applications.

2.06 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Shear and punch metals cleanly and accurately. Remove burrs.
- C. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. 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.
- E. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

- F. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- G. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.
- H. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
- I. Remove sharp or rough areas on exposed traffic surfaces.
- J. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.

2.07 STEEL ANGLES

- A. Fabricate angles from steel angles of sizes required or indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch bolts, spaced not more than 6 inches from ends and 24 inches o.c., unless otherwise indicated.
- B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete. Align expansion joints in angles with indicated control and expansion joints.
- C. Galvanize steel angles to be installed in all walls. All exposed exterior angles shall also be painted.

2.08 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports that are not a part of structural-steel framework as necessary to complete the Work.
- B. Fabricate units from structural-steel shapes, plates, and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.
 - 1. Fabricate units from slotted channel framing where indicated.
- C. Galvanize all miscellaneous framing and supports.

2.09 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal fabrications after assembly.

2.10 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:
 - 1. ASTM A 123, for galvanizing steel and iron products.
 - 2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.

- B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface-preparation specifications and environmental exposure conditions of installed metal fabrications:
 - 1. Exteriors (SSPC Zone 1B): SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 2. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."
- C. Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for shop painting.
 - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal fabrications to in-place construction. Include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors.
- B. 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.
- C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- D. 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.
- E. 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.
- F. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- G. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.
 - 1. Use nonshrink grout, either metallic or nonmetallic, in concealed locations where not exposed to moisture; use nonshrink, nonmetallic grout in exposed locations, unless otherwise indicated.
 - 2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.02 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings, if any.

3.03 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9 Section "Painting."
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 05500

DIVISION 06 WOODS, PLASTICS, AND COMPOSITES

SECTION 06100 - ROUGH CARPENTRY

PART 1-GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Rough carpentry for:
 - a. Miscellaneous lumber for attachment and support of other work.
 - b. Wood furring.
 - 2. Preservative treatment.
- B. Treated Wood: Treating plant's instructions for use, including storage, cutting, and finishing.
 - 1. Pressure preservative treatment: Treating plant's certification of compliance with specified standards and stating process employed and preservative retention values.
 - a. Treatment for above-ground use: Certification of kiln drying after treatment.

PART 2 - PRODUCTS

2.01 DIMENSION LUMBER

- A. Size: Provide nominal sizes indicated, complying with NIST PS 20 except where actual sizes are specifically required.
- B. Miscellaneous Lumber: Provide dimension lumber and boards necessary for the support of work specified in other sections, whether or not specifically indicated, and including but not limited to blocking, nailers, etc.
 - 1. Moisture content: 15 percent maximum (kiln-dry).
 - 2. Lumber: S4S, No. 2 or standard grade.
 - 3. Boards: Construction, 2 common, or No. 2 grade.

2.02 MISCELLANEOUS MATERIALS

- A. Fasteners: Provide as required by applicable codes and as otherwise indicated.

2.03 WOOD TREATMENT BY PRESSURE PROCESS

- A. Aboveground Lumber: AWPB LP-2 (waterborne preservatives).
 - 1. Kiln dried after treatment to 19 percent maximum moisture content.
 - 2. Treat the following:
 - a. Wood in contact with roofing, flashing, or waterproofing.
 - b. Wood in contact with masonry or concrete.
 - c. Other members indicated.
- B. Fasteners for Preservative Treated Wood: Hot-dip galvanized steel (ASTM A153).

PART 3 - EXECUTION

3.01 INSTALLATION – GENERAL

- A. Arrange work to use full length pieces except where lengths would exceed commercially available lengths. Discard pieces with defects that would lower the required strength or appearance of the work.
- B. Cut and fit members accurately. Install plumb and true to line and level.
- C. Fasten carpentry in accordance with applicable codes and recognized standards.
- D. Where exposed, countersink nails and fill flush with suitable wood filler.

3.02 MISCELLANEOUS CARPENTRY

- A. Provide miscellaneous blocking, nailers, grounds, and framing as shown and as required for support of facing materials, fixtures, specialty items, and trim. Cut and shape to the required size. Provide in locations required by other work.
- B. Use countersunk fasteners appropriate to applied loading.

3.03 WOOD FURRING

- A. Install wood furring plumb and level; shim as necessary to bring true to plane; install closure strips at ends perpendicular to main furring direction.
 - 1. Suspended furring: Provide where shown. Include suitable hangers anchors.

END OF SECTION 06100

SECTION 06 17 00 - PREFABRICATED STRUCTURAL WOOD

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Laminated veneer lumber (LVL).
- B. Laminated strand lumber (LSL).
- C. Prefabricated wood joists (I-Joists).
- D. Rim boards.

1.2 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry: Stud wall bracing and sheathing.
- B. Section 07260 - Vapor Retarders: Vapor retarder on exterior walls and in crawl space.

1.3 REFERENCE STANDARDS

- A. International Code Council (ICC-ES):
 - 1. LVL Report Number: ESR-2403
 - 2. LSL Report Number: ESR-2403
 - 3. I-Joist Report Number: ESR-1305.
 - 4. I-Joist APA Product Report Number: PR-L238
- B. American Society for Testing and Materials International (ASTM):
 - 1. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - 2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

1.4 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Provide engineered wood products and installed systems which have been engineered, manufactured, fabricated and installed to meet the specified performance requirements.
 - 2. Regulatory Requirements and Approvals: Provide engineered wood products meeting the requirements of the referenced building code compliance reports.
- B. Performance Requirements:
 - 1. Deflection Requirements
 - a. Live load deflection limit as indicated on drawings.
 - 2. Assembly Fire Resistance Rating (ASTM E119): Members and connections required of this section are an integral part of required fire resistance assemblies indicated or required by the design.
 - a. Provide members and connections to comply with fire rated assembly scheduled.

3. Assembly Sound Transmission Class (STC) (ASTM E90): Members and connections required of this section are an integral part of required sound privacy assemblies indicated or required by the design.
 - a. Provide members, connections and details to comply with sound privacy indicated in the drawings and/or schedules.
4. Assembly Impact Isolation Criteria (IIC) (ASTM E90): Members and connections required of this section are an integral part of required sound privacy assemblies indicated or required by the design.
 - a. Provide members, connections and details to comply with sound privacy indicated in the drawings and/or schedules.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.
- C. Design Data: Submit design calculations signed and sealed by a professional engineer registered in the state of the Project location.
- D. Test Reports: Upon request provide current structural, fire and sound test reports from recognized testing laboratories.
- E. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics, criteria and physical requirements.
- F. Shop Drawings: Provide drawings indicating member type by manufacturer's series, size, location and connection details.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 1. Having a minimum 5 years experience manufacturing components comparable to or exceeding requirements of project.
 2. Having sufficient capacity to produce and deliver required materials without causing delay in the Work.
- B. Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size and complexity.
- C. Mock-Up: Provide a mock-up for evaluation of visually critical members and connections surface preparation techniques and application workmanship.
 1. Finish areas and connection details designated by Architect.
 2. Do not proceed with remaining work until workmanship, connection details, and finish are approved by Architect.
 3. Correct mock-up as required to produce acceptable work.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

1. Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
 2. Keep materials dry and store on a hard, dry, level surface not in contact with the ground.
 3. Store materials in wrapped and strapped bundles stacked no more than 10 feet (3 m) high.
 4. Support bundles to prevent excessive bowing. Support and separate bundles with dimension lumber spaced no more than 10 feet (3 m) apart. Keep supports in line vertically.
 5. Handle individual pieces in a manner to prevent physical damage during measuring, cutting and erection.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 WARRANTY

- A. Manufacturer shall provide material warranty:
1. Warranty Period: Lifetime Limited Warranty beginning with date of substantial completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
- B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 LAMINATED WOOD VENEER LUMBER (LVL)

- A. Product: LP SolidStart Laminated Veneer Lumber (LVL) by LP Building Products.
1. Material: Ultrasonically and visually graded veneers arranged to specific patterns so that naturally occurring defects have no concentrated effect on the member's performance. Waterproof adhesive bonded under pressure and heat.
 2. Water Resistant Coating:
 - a. No coating required.
 3. Member: LVL.
 - a. Grade (Bending/Modulus of Elasticity):as noted in drawings
 - b. Thickness: as noted in drawings

- c. Depth: as noted in drawings
- d. Plies: as noted in drawings
- 4. Member: LVL Billet Beam.
 - a. Grade (Bending/Modulus of Elasticity): as noted in drawings
 - b. Thickness: as noted in drawings
 - c. Depth: as noted in drawings
 - d. Plies: as noted in drawings

2.3 LAMINATED WOOD STRAND LUMBER (LSL)

- A. Product: LP SolidStart Laminated Strand Lumber (LSL) by LP Building Products.
 - 1. Material: Strands arranged parallel to the finished product's length. MDI, bonded and cured under pressure and heat.
 - a. Water Resistant Coating: No coating required.
 - 2. Member: LSL.
 - a. Grade (Bending/Modulus of Elasticity): as noted in drawings
 - b. Thickness: as noted in drawings
 - c. Depth: as noted in drawings
 - d. Plies: as noted in drawings

2.4 WOOD JOISTS

- A. Product: LP SolidStart I-Joists by LP Building Products.
 - 1. Member: Solid sawn lumber top and bottom chords permanently attached to oriented strand board webs.
 - a. Flange Width: as noted in drawings
 - b. Flange Material: as noted in drawings
 - c. Depth: as noted in drawings
 - d. Depth: as noted in drawings
 - e. Depth: as noted in drawings

2.5 RIM BOARD

- A. Product: LP SolidStart Rim Board by LP Building Products.
 - 1. Material LP SolidStart Rim Board provides strength to the flooring system and is precision-cut to match the depths of LP SolidStart I-Joists.
 - 2. Grade (Bending/Modulus of Elasticity): as noted in drawings
 - a. Compression Stress Perpendicular to Grain (FC): as noted in drawings
 - b. Thickness: as noted in drawings
 - c. Depth: as noted in drawings
 - d. Length: as noted in drawings

2.6 ACCESSORIES

- A. Provide engineered connectors specifically designed for connection type and application. Refer to drawings and schedules.
- B. Provide nail and fastener types and sizes per member manufacturer's details and recommendations.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until supporting work has been properly prepared.
- B. If supporting work is the responsibility of another installer, notify Architect of unsatisfactory work before proceeding.

3.2 PREPARATION

- A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the installation under the project conditions.

3.3 GENERAL INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install engineered wood products in compliance with approved shop drawings.
- C. Conditions and Practices Not Permitted:
 - 1. Do not place holes closer to supports than recommended by manufacturer.
 - 2. Do not over cut holes and damage flanges.
 - 3. Do not make holes with hammer unless a knockout is provided for this purpose.
 - 4. Do not hammer on flange and damage joist.
 - 5. Do not cut, notch or drill flange.
 - 6. Do not use 16d or larger nails in flange.
 - 7. Do not bevel cut joist ends inside edge of bearing.
 - 8. Do not support joist on web.
 - 9. Do not install visibly damaged joists.

3.4 JOIST INSTALLATION

- A. Accurately fit, align, securely fasten and install free from distortion or defects.
- B. Conditions and Practices Required:
 - 1. Carefully unload joists by lifting, using forklifts or cranes to avoid damage.
 - 2. Keep joists stored in wrapped and strapped bundles stacked no more than 10 feet (3 m) high.
 - 3. Support bundles to prevent excessive bowing. Support and separate bundles with dimension lumber spaced no more than 10 feet (3 m) apart. Keep supports in line vertically.
 - 4. Handle individual joists in a manner to prevent physical damage during measuring, cutting and erection.
 - 1. Handle joists vertically, not horizontally (flat).
 - 2. Use at least 1 by 4 temporary bracing members nailed to each joist with two 8d common nails. Keep rows of bracing parallel at no more than 8 feet (2.5 m) apart.
 - 3. Use long pieces for bracing, not short blocks. Lap ends to form a continuous line of bracing.
 - 4. Anchor bracing at ends and at 25 feet (7.5 m) intervals into a stable end wall or an area braced by sheathing or diagonal bracing.
 - 5. Exercise caution when removing temporary bracing when applying sheathing.

- Remove bracing as sheathing is attached.
6. All rim joists, blocking, connections and temporary bracing shall be installed before erectors are allowed on the structure.
 7. Impose no loads other than the weight of the erectors on the structure before it is permanently sheathed.
 8. After sheathing, do not exceed design loads on joists with construction materials.
 9. Support joists laterally at end bearings and cantilevers.
 10. I-joists shall have a minimum end bearing length of 1-1/2 inches (38 mm) for all I-joists having a depth not greater than 16 inches (406 mm) and a minimum end bearing length of 2-1/2 inches (64 mm) for all I-joists deeper than 16 inches (406 mm). All I-joists require a minimum intermediate bearing length of 3-1/2 inches (89 mm) regardless of series and depth.
 11. Refer to drawings and member schedule for end bearing and interior bearing stiffener requirements.

3.5 LAMINATED VENEER LUMBER INSTALLATION

- A. Install laminated veneer lumber plumb and level.
- B. Accurately fit, align, securely fasten and install free from distortion or defects.
- C. Temporary Bracing:
 1. LVL shall be securely braced during construction. Temporary bracing shall be anchored to the ground, foundation, a braced wall or other completed, stable section of the structure.
 2. Exercise caution when removing temporary bracing when applying sheathing. Remove bracing as sheathing is attached.
 3. All rim joists, blocking, connections and temporary bracing shall be installed before erectors are allowed on the structure.
 4. Impose no loads other than the weight of the erectors on the structure before it is permanently sheathed.
 5. After sheathing, do not exceed design loads on members with construction materials.
 6. Support members laterally at end bearings and cantilevers.
 7. All conditions calling for notched or drilled beams must be reviewed and approved by a licensed professional engineer.

3.6 LAMINATED STRAND LUMBER INSTALLATION

- A. Install laminated strand lumber plumb and level.
- B. Accurately fit, align, securely fasten and install free from distortion or defects.
- C. Temporary Bracing:
 1. Securely brace LSL during construction by anchoring to the ground, foundation, a braced wall or other completed, stable section of the structure.
 2. Support members laterally at end bearings and cantilevers.
 3. Install all rim joists, blocking, connections and temporary bracing before erectors are allowed on the structure.
 4. Impose no loads other than the weight of the erectors on the structure before it is permanently sheathed.
 5. Exercise caution when removing temporary bracing to apply sheathing.

6. After sheathing, do not exceed design loads on members with construction materials.
7. All conditions calling for notched or drilled beams must be reviewed and approved by a licensed professional engineer.

3.7 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 06 10 00

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SECTION 06 41 13 - ARCHITECTURAL WOOD CASEWORK

PART 1 -

1.1 SUMMARY

A. Section Includes:

1. Custom casework.
 - a. Plastic-laminate-finished casework.
2. Countertops.
 - a. Plastic-laminate-finished countertops.
3. Cabinet hardware.
4. Interior finish carpentry.
 - a. Standing and running trim.
 - b. Shelving.
5. Prefinish the Work of this Section.

B. Related Requirements:

1. Section 061053 - Miscellaneous Rough Carpentry: Grounds and support framing.
2. Section 062000 - Finish Carpentry: Exterior finish carpentry.
3. Section 064214 - Stile and Rail Wood Paneling.
4. Section 064216 - Flush Wood Paneling.
5. Section 088000 - Glazing: Glass for casework.

1.2 REFERENCE STANDARDS

A. American National Standards Institute:

1. ANSI A135.4 - Basic Hardboard.
2. ANSI A156.9 - Cabinet Hardware.
3. ANSI A208.1 - Mat-Formed Wood Particleboard.

B. APA - The Engineered Wood Association:

1. APA/EWA PS 1 - Voluntary Product Standard for Construction and Industrial Plywood.

C. Architectural Woodwork Institute, Woodwork Institute, and Architectural Woodwork Manufacturers Association of Canada:

1. AWS - Architectural Woodwork Standards.
2. Supplemented with The WI Approach.

D. ASTM International:

1. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

2. ASTM A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 3. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
 4. ASTM D1037 - Standard Test Methods for Evaluating Properties of Wood Base Fiber and Particle Panel Materials.
 5. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 6. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- E. Decorative Hardwoods Association:
1. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood.
- F. Forest Stewardship Council:
1. FSC Guidelines - Forest Stewardship Council Guidelines.
- G. Green Seal:
1. GS-11 - Product Specific Environmental Requirements.
 2. GS-36 - Aerosol Adhesives.
- H. National Electrical Manufacturers Association:
1. NEMA LD 3 - High-Pressure Decorative Laminates.
- I. National Fire Protection Association:
1. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.
- J. U.S. Department of Commerce National Institute of Standards and Technology:
1. DOC PS 20 - American Softwood Lumber Standard.
- K. Window and Door Manufacturers Association:
1. WDMA I.S.4 - Water-Repellent Treatment for Millwork.
- 1.3 PREINSTALLATION MEETINGS
- A. Section 013000 - Administrative Requirements: Requirements for preinstallation meeting.
 - B. Convene minimum **[one]** week prior to commencing Work of this Section.
- 1.4 SUBMITTALS
- A. Section 013300 - Submittal Procedures: Requirements for submittals, including AWS Section 1.
 - B. Product Data: Submit data on:
 1. Fire-retardant treatment materials and application instructions.

2. High-pressure decorative laminates.
3. Hardware accessories.

C. Shop Drawings:

1. Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location, schedule of finishes, and Certified Compliance Label on each set.

D. Samples:

1. Submit **two, 8 x 10 in** samples, illustrating cabinet finish.
2. Submit **two, 8 x 10 in** samples, illustrating countertop.
3. Submit **one** sample of **drawer pulls, hinges**, illustrating hardware finish.

- E. Delegated Design Submittals: Submit signed and sealed Shop Drawings with design calculations and assumptions for stairs, handrails, and balusters under direct supervision of licensed professional.

F. Qualification Statements:

1. Submit qualifications for **fabricator**.

1.5 QUALITY ASSURANCE

- A. Perform Work according to AWS, Section 6, **Section 7**, Section 10, and **Section 11**; **grades identified in Section**.

B. Surface Burning Characteristics:

1. Maximum **75/450** flame-spread/smoke-developed index when tested according to ASTM E84.
2. Comply with the following when tested according to NFPA 286.
 - a. During 40 kW Exposure: No flame spread to ceiling.
 - b. During 160 kW Exposure: No flame spread to perimeter of tested sample and no flashover.
 - c. Total Smoke Release: Maximum 1 000 cu m.

- C. Apply label from agency approved by authority having jurisdiction to identify each **fire-retardant-treated and preservative-treated** material.

- D. Perform Work according to State of Alabama Department of Transportation," "Municipality of Mobile Department of Public Works," or other agency as appropriate. standards.

- E. Maintain **1 copy** of each standard affecting the Work of this Section on Project Site.

1.6 QUALIFICATIONS

A. Fabricator:

1. Company specializing in fabricating products specified in this Section with minimum **five production** experience similar to this Project.
2. Licensed by Architectural Woodwork Institute Quality Certification Program

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Protect units from moisture damage.

1.8 AMBIENT CONDITIONS

- A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient conditions control facilities for product storage and installation.
- B. Maintain storage space relative humidity within ranges indicated in AWS Section 2.
- C. Subsequent Conditions: Maintain same temperature and humidity conditions in building spaces as will occur after occupancy during and after installation of Work of this Section.

1.9 EXISTING CONDITIONS

- A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 CUSTOM CASEWORK

- A. Substitutions: **Section 016000 - Product Requirements.**
- B. Plastic-Laminate-Finished Custom Casework:
 - 1. **Frameless** construction.
 - 2. Style: **Flush inset.**
 - 3. **AWS Section 10.**
 - 4. **Custom grade**
 - 5. Exterior and Interior Exposed Surfaces: High-pressure decorative laminate over **particleboard** or **medium density fiberboard**
 - 6. Semi-Exposed Surfaces: **High-pressure decorative laminate over particleboard** or **High-pressure decorative laminate over medium density fiberboard.**
- C. Casework Construction Details:
 - 1. Drawer Side Joinery: **Lock jointed.**
 - 2. Drawer and Door Edge Profile: [**Square with thin, applied band.**
 - 3. Toe Base Finish: **Stained Wood.**
 - 4. Grain Direction: **Vertical**
- D. Plastic-Laminate-Finished Countertops: **Self-edged.**
 - 1. Core: **Particleboard** or **Medium density fiberboard.**
 - a. Core at Sink Tops: Exterior or exterior glue type panels.

2. Splash Top Profile: **Square**.
3. Deck at Splash Joint Type: **Vertical butt**.
4. Front Edge: **As indicated on Drawings**.
5. Splash Assembly: **Field assembled**].

2.2 INTERIOR FINISH CARPENTRY

- A. Substitutions: **Section 016000 - Product Requirement**
- B. Shelving: **Softwood plywood**.
 1. Wood Cleats: **3/4 by 3-1/2 in (19 by 89 mm)** where clothes rods are indicated.
 2. Opaque-Finished Shelving: AWS Section 6; **custom** grade.
 3. Transparent-Finished Shelving: AWS Section 6; **custom** grade.
 4. High-Pressure Decorative Laminate Finished Shelving: AWS **economy** grade.
- C. Performance and Design Criteria:

2.3 CASEWORK MATERIALS

- A. Softwood Lumber: **Yellow Pine**.
 1. Cut: **Plain sawn**.
- B. Lumber Moisture Content Range: **8 to 13** percent.
- C. Softwood Plywood: APA/EWA PS 1 and HPVA HP-1; **particleboard medium-density fiberboard** core; **yellow pine** face species.
 1. Veneer Slicing: **Vertical grain**
 2. Matching of Individual Leaves to Each Other: **Random** matching.
 3. Matching Across Panel Face: **Running** matching.
 4. Matching or Relationship of Panels to Each Other: **Sequence-matched, uniform-size sets** matching.
- D. Particleboard: ANSI A208.1 Grade M2 or better; composed of wood chips or sawdust, **[medium]** density.
 1. Fire-Retardant Particleboard: ASTM E84; 25 maximum flame-spread index and 450 maximum smoke-developed index.
- E. Medium-Density Fiberboard: ANSI A208.2, composed of wood fibers, **medium** density.
 1. Fire-Retardant Fiberboard: ASTM E84; 25 maximum flame-spread index and 450 maximum smoke-developed index.
- F. Medium-Density Overlay: APA/EWA PS 1; softwood plywood, exterior type, with paper face suitable for opaque finish.
- G. High-Pressure Decorative Laminate (HPDL): NEMA LD 3; **as selected**.
 1. Horizontal Surfaces: **HGS; 0.048 in (1.2 mm) thick**
 2. Vertical Surfaces: **VGS; 0.028 in (0.7 mm) thick**

3. Post-Formed Surfaces: **HGP; 0.039 in (1.0 mm) thick**
4. Cabinet Liner: CLS; **0.020 in (0.5 mm) thick**.
5. Backing Sheet: BKL; **0.020 in (0.5 mm) thick**.

2.4 WOOD TREATMENT

- A. Fire-Retardant Treatment: Chemically treated and pressure impregnated, having flame spread of 25 or less when tested according to ASTM E 84 and showing no evidence of significant progressive combustion when test is continued for an additional 20-minute period, [**interior exterior**] type.
- B. Provide identification on fire-retardant-treated material.
- C. Deliver fire-retardant-treated materials cut to required sizes. Minimize field cutting.
- D. Moisture Content after Treatment: **Kiln dried (KDAT)**.
 1. Lumber: As specified for **interior** lumber.
 2. Plywood: Maximum 15 percent.

2.5 FABRICATION

- A. Fabricate interior finish carpentry to AWS Section 6 **custom** grade.
- B. Fabricate casework to AWS Section 10 [**custom** grade.
- C. Fabricate countertops to AWS Section 11 **economy** grade.
- D. Shop-assemble casework for delivery to Site in units easily handled and to permit passage through building openings.
- E. Fit exposed plywood edges with **matching veneer** edging. Use one piece for full length only.
- F. Cap exposed high-pressure decorative laminate finish edges with **material of same finish and pattern**.
- G. Door and Drawer Fronts: **3/4 in ([19] mm)** thick.
- H. When necessary to cut and fit on Project Site, fabricate materials with ample allowance for cutting. Furnish trim for scribing and Site cutting.
 1. Apply high-pressure decorative laminate finish in full, uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. [**Locate plastic laminate joints minimum 18 in (450 mm) from sink cutouts**.
 2. Apply wood laminate by grain matching adjacent sheets to [**end**] matching.
- I. Apply laminate backing sheet to reverse side of **plastic-laminate-finished surfaces where required by AWS for specified grade**.
- J. Fabricate cabinets and countertops with cutouts for **plumbing fixtures inserts appliances outlet boxes fixtures and fittings**. Verify locations of cutouts from Site dimensions. **Seal** cut edges.

2.6 ACCESSORIES

- A. Adhesive for High-Pressure Decorative Laminates: Type recommended by laminate manufacturer to suit application.
- B. Fasteners and Anchors:
 - 1. Fasteners: **ASTM A153 (A153M), hot-dip galvanized** for high-humidity and treated wood locations, unfinished steel elsewhere.
 - 2. Nails and Staples: ASTM F1667.
- C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; **<zinc>** finish in concealed locations and **bronze** finish in exposed locations.
- D. Concealed Joint Fasteners: Threaded steel.
- E. Veneer Edge Band: AWS; standard wood veneer edge band matching face veneer.
- F. Glass: As specified in Section 088000 - Glazing.
- G. Safety Glass: **fully tempered, <1/4> in (<6> mm) thick [minimum].**
- H. Grommets: **[Plastic]** material for cutouts.
- I. Hardware: BHMA A156.9.
- J. Shelf Rests:
 - 1. In-line bored holes **1 in (25 mm)** o.c., to within **6 in (150 mm)** of top and bottom of opening with four support pins for each shelf.
- K. Hardware: BHMA A156.9
 - 1. Shelf Standards: black finish.
- L. Shelf Brackets: **Formed steel brackets, formed for attachment with lugs; satin finish.**
 - 1. Standard metal shelf pin
 - 2. Drilling Diameter: 1/4"
 - 3. Projection: 1/2"
 - 4. Load Capacity: 176 lbs
 - 5. Shelf Thickness: minimum 1/2"
- M. Drawer **and Door** Pulls:
 - 1. Richelieu Basis of Design
 - a. Contemporary Aluminum Edge Pull 9595
 - b. Finish: Matte Black
 - c. Dimensions: 5 1/32" center to center, 5 13/16" length
 - d. ADA
- N. Sliding Glass Door Systems:
 - 1. Richelieu BP 15510 Basis of Design
 - a. Door Thickness: 1/4"
 - b. Finish: Satin Aluminum
 - c. Top and Bottom E-Tracks
 - d. Silencer Insert
 - e. End Cap

- 1) Zamak
 - f. U-Spine
 - 1) Plastic
 - g. Trolley
 - h. Glass H-Rail
 - i. Handle
 - j. Lock with No. 1 Identical Keys
- O. Cabinet Locks: Keyed cylinder, two keys for each lock, **master keyed, with satin nickel finish.**
- P. Catches: **Magnetic**
 - 1. Richelieu Basis of Design
 - a. BP 52090
 - b. Finish: black
 - c. Dimensions: 1 5/8" width (1 1/4" center to center), 3/4" depth, 1/2" height
 - d. Plate and screws
- Q. Drawer Slides: Self-closing, **stainless steel construction, ball bearings separating tracks, rail mounted full extension type.**
 - 1. Richelieu Basis of Design
 - a. Brand: Sugatsune 4513SC17016
 - b. Length: 16"
 - c. Soft-close system ensures smooth, silent closing, with no more slamming drawer.
 - d. Hold-in detent keeps the slide closed until force is applied.
 - e. Positive stop: stops the drawer in the open position, but does not lock or snap
- R. Hinges: Concealed Grade **knuckle disappearing** type, **with satin finish**
 - 1. Richelieu Basis of Design
 - a. Type: Traditional Steel Hinge 3180
 - b. Finish: Matte Black
 - c. Finial Style: Ball
 - d. Dimensions: 2.5" length, 1.7" width, 2.8" projection
 - e. Wood screws
- S. Sliding Door Track Assemblies: **Galvanized steel construction, ball bearing carriers fitted within tracks, multiple pendant suspension attachments for door**

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify adequacy of backing and support framing.
- C. Verify location and sizes of utility rough-in associated with Work of this Section.

3.2 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.

- B. Prime paint surfaces of woodwork items and assemblies to be in contact with cementitious materials.

3.3 INSTALLATION

- A. Install interior finish carpentry according to AWS Section 6 **custom** grade.
- B. Install casework according to AWS Section 10 **custom** grade.
- C. Install countertops according to AWS Section 11 **custom** grade.
- D. Set and secure casework, interior finish carpentry, and countertops in place; rigid, plumb, and level.
- E. Use fixture attachments in concealed locations for wall-mounted components.
- F. Use concealed joint fasteners to align and secure adjoining **cabinet units** and **countertops**.
- G. Carefully scribe casework abutting other components, with maximum gaps of **[1/32] in ([0.7] mm)**. **Do not** use additional overlay trim for this purpose.
- H. Secure woodwork **cabinet] and counter bases** to floor using appropriate angles and anchorages.
- I. Countersink anchorage devices at exposed locations.
 - 1. Conceal with solid wood plugs of species to match surrounding wood;
 - 2. Finish flush with surrounding surfaces.
- J. **Site glaze glass materials using interior dry method specified in Section 088000 - Glazing**

3.4 TOLERANCES

- A. Section 014000 - Quality Requirements: Requirements for tolerances.
- B. Conform to AWS Sections 6 and 10 requirements for the following:
 - 1. Smoothness.
 - 2. Gaps.
 - 3. Flushness.
 - 4. Flatness.
 - 5. Alignment.
- C. Maximum Variation from Indicated Position: **[1/16] in ([1.5] mm)**.
- D. Maximum Offset from Alignment with Abutting Materials: **[1/32] in ([0.7] mm)**.

3.5 ADJUSTING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for starting and adjusting.
- B. Adjust moving or operating parts to function smoothly and correctly.

3.6 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION 06 41 13

SECTION 064116 - PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Plastic-laminate-clad architectural cabinets.
2. Cabinet hardware and accessories.
3. Miscellaneous materials.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing cabinets that are concealed within other construction before cabinet installation.
2. Section 123623.13 "Plastic-Laminate-Clad Countertops."
3. Section 123661.16 "Solid Surfacing Countertops."

1.2 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to support loads imposed by installed and fully loaded cabinets.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Plastic-laminate-clad architectural cabinets.
2. Cabinet hardware and accessories.
3. Miscellaneous materials.

B. Shop Drawings:

1. Include plans, elevations, sections, and attachment details.
2. Show large-scale details.
3. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
4. Show locations and sizes of cutouts and holes for items installed in plastic-laminate architectural cabinets.

- C. Samples: For each exposed product and for each color and texture specified, in manufacturer's or manufacturer's standard size.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer and Installer.

1.5 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: 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: Manufacturer of products.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver cabinets until painting and similar finish operations that might damage architectural cabinets have been completed in installation areas. Store cabinets in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.7 FIELD CONDITIONS

- A. Environmental Limitations without Humidity Control: Do not deliver or install cabinets until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- B. Environmental Limitations with Humidity Control: 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 (16 and 32 deg C) and relative humidity between 20 and 50 percent during the remainder of the construction period.
- C. Field Measurements: Where cabinets 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.
 - 1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed/concealed by construction, and indicate measurements on Shop Drawings.
- D. 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.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

- A. Quality Standard: Unless otherwise indicated, comply with the Architectural Woodwork Standards for grades of cabinets indicated for construction, finishes, installation, and other requirements.
- B. Architectural Woodwork Standards Grade: Premium.
- C. Type of Construction: Frameless.
- D. Door and Drawer-Front Style: Reveal overlay.
 - 1. Reveal Dimension: 1/8 inch (3 mm).
- E. High-Pressure Decorative Laminate: ISO 4586-3, grades as indicated or if not indicated, as required by quality standard.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Formica Corporation.
- F. Exposed Surfaces:
 - 1. Plastic-Laminate Grade: HGS at Horizontal Surfaces; VGS at Vertical Surfaces.
 - 2. Edges: PVC edge banding, 3.0 mm thick, matching laminate in color, pattern, and finish.
 - 3. Pattern Direction: Vertically for doors and fixed panels, horizontally for drawer fronts.
- G. Semiexposed Surfaces:
 - 1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, ISO 4586-3.
 - a. Edges of Plastic-Laminate Shelves: PVC edge banding, 3.0 mm thick, matching laminate in color, pattern, and finish.
 - 2. Drawer Sides and Backs: Thermally fused laminate panels with PVC or polyester edge banding.
 - 3. Drawer Bottoms: Thermally fused laminate panels.
- H. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.

1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints.
- I. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 1. As indicated in Section 090600 "Schedules for Finishes."
- 2.2 WOOD MATERIALS
- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
 1. Wood Moisture Content: 4 to 9 percent.
 - B. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
 1. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 130.
 2. Particleboard (Medium Density): ANSI A208.1, Grade M-2-Exterior Glue.
 3. Softwood Plywood: DOC PS 1, medium-density overlay.
 4. Thermally Fused Laminate (TFL) Panels: Particleboard or MDF finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of ISO 4586.
- 2.3 CABINET HARDWARE AND ACCESSORIES
- A. Cabinet Hardware: Provide cabinet hardware and accessory materials associated with architectural cabinets.
 - B. Frameless Concealed Hinges (European Type): ANSI/BHMA A156.9, B01602, 135 degrees of opening.
 - C. Tab Pulls: Solid metal, 4 inches (100 mm) long, 1-1/2 inch (38 mm) projection, 3 inches (76 mm) on center, with Satin Chrome finish.
 - D. Catches: Magnetic catches, ANSI/BHMA A156.9, B03141.
 - E. Adjustable Shelf Standards and Supports: ANSI/BHMA A156.9, B04071; with shelf rests, B04081.

- F. Drawer Slides: ANSI/BHMA A156.9.
 - 1. Standard Duty (Grade 1 and Grade 2): Side mount.
 - 2. General-purpose drawers more than 3 inches (75 mm) high, but not more than 6 inches (150 mm) high and not more than 24 inches (600 mm) wide, provide 75 lb (34 kg) load capacity.
- G. Door and Drawer Silencers: ANSI/BHMA A156.16, L03011.
- H. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for ANSI/BHMA finish number indicated.
 - 1. Satin Stainless Steel: ANSI/BHMA 630.
- A. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in ANSI/BHMA A156.9.

2.2 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.
- C. Adhesive for Bonding Plastic Laminate: Type II water-resistant type as selected by fabricator to comply with requirements.
 - 1. Adhesive for Bonding Edges: Recommended type for Substrate and Edge by Manufacturer of Products.

2.3 FABRICATION

- A. Fabricate architectural cabinets 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 architectural cabinet fabrication will be complete.
2. Trial fit assemblies at manufacturer's 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

3.1 PREPARATION

- A. Before installation, condition cabinets to humidity conditions in installation areas for not less than 72 hours.

3.2 INSTALLATION

- A. Architectural Woodwork Standards Grade: Install cabinets to comply with quality standard grade of item to be installed.
- B. Assemble cabinets and complete fabrication at Project site to extent that it was not completed in the shop.
- C. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with wafer-head cabinet installation screws.
- D. Install cabinets level, plumb, and true in line to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm) using concealed shims.
1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
 2. Install cabinets without distortion so doors and drawers fit openings 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.
 3. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches (400 mm) o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch (38-mm) penetration into wood framing, blocking, or hanging strips.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects. Where not possible to repair, replace architectural cabinets. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean cabinets on exposed and semiexposed surfaces.

END OF SECTION 06 41 16

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SECTION 066140 - SOLID SURFACE FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including general and supplementary conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Furnish labor, materials, tools and other equipment, and services necessary to provide solid surface fabrications, including all components and accessory items required for a complete installation.
 - 1. Window sills
 - 2. Millwork Tops
- B. Work under this Section also includes moisture and alkalinity testing, and surface preparation of substrates as required for acceptance of solid surface fabrication including but not necessarily limited to, cleaning, small crack repair, patching, filling, any other work required to provide an appropriate substrate
- C. This Specification shall be supplemented by any applicable federal, state and local building codes, guidelines, regulations, and standards adopted in the immediate geographic area of the Project; insurance rating organizations; including all other Authorities Having Jurisdiction.

1.3 RELATED SECTIONS

- 1. Division 05 Section "Metal Fabrications" for metal blocking.
- 2. Division 06 Section "Miscellaneous Rough Carpentry" and/or "Rough Carpentry" for wood blocking.

1.4 REFERENCE STANDARDS

- 1. International Solid Surface Fabricators Association (ISSFA)
 - a. ISSFA-2: Classification and Standards Publication of Solid Surfacing Material

1.5 ACTION SUBMITTALS

- A. Submit items in accordance with Division 01 Section "Submittal Procedures"
- B. Product Data: For each type of product indicated, submit copies of manufacturer's product data, installation instructions and accessories specified and/or required by manufacturer.

- C. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
1. Show full size details, edge details, thermoforming requirements and attachments.
 2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Section.
 3. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, and other items installed in solid surface fabrications.
 4. Samples for Verification:
 - a. Submit two (2) six-inch square samples of each color and finish.
 - b. Submit sample showing inconspicuous seam representation.
 - c. Manufacturers joint sealant for wainscoting/paneling.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of solid surface material, provide manufacturer's care and maintenance data, including repair and cleaning instructions.
1. Provide maintenance kit for each finish.

1.7 QUALITY ASSURANCE

- A. Qualification Data: Verify Installer is qualified and approved by Manufacturer/Supplier, with a minimum of five years of continuous, uninterrupted experience in successfully installing 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, and who agrees to employ only skilled tradesmen with a minimum of five years of experience.
- B. Source Limitations: Obtain solid surface fabrications with all accessory products, from single source from single manufacturer.
- C. Fire Test Response Characteristics: Provide with the following Class A (Class I) surface burning characteristics as determined by testing identical products per ASTM E84, UL 723, or another testing and inspecting agency acceptable to Authorities Having Jurisdiction.
1. Flame Spread Index: 25 or less
 2. Smoke Developed Index: 450 or less
- D. Mock-Ups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

- E. Preinstallation Conference: Conduct conference at Project site prior to commencement of Shop Drawings to comply with Contractor, Subcontractor, Architect/Designer and others, as required.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install solid surfacing fabrications until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at design levels during the remainder of the construction period.
- B. Field Measurements: Where solid surface fabrication is indicated to fit to other construction, certify 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.
 - 1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurement on Shop Drawings.

1.9 COORDINATION

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

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Solid Surface Materials: Homogeneous solid sheets of filled plastic resin complying with ANSI SS1.
- B. Colors and Patterns: See Finish Materials Listing in the Finish Drawings.
- C. Edge Treatment: As indicated in the Drawings.
- D. Thickness: See Finish Materials Listing in the Finish Drawings.
- E. Finish: See Finish Materials Listing in the Finish Drawings.
- F. Inlays: Fabricate using manufacturer's written recommendations.

2.2 ACCESSORIES

- A. Joint Adhesive: Manufacturer's standard to create inconspicuous, nonporous joints.

1. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - a. Contact Adhesive: 250 g/L.
 - b. Wood Glues: 30 g/L.

2.3 FABRICATION

- A. Fabricate solid surface to dimensions, profiles, and details indicated.
- B. Complete fabrication, including assembly, finishing, 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.
- C. Recess and conceal fasteners, connections, and reinforcing.
- D. Design construction and installation details to allow for expansion and contraction of materials.
- E. Form joints between components using manufacturer's standard joint adhesive with tight, non-conspicuous, hairline joints.
- F. Fabricate items to profiles shown with connections and supports as indicated, or as required for complete installation in accordance with manufacturer's written instructions.
- G. Rout and finish component edges with clean, sharp returns. Rout cutouts, radii and contours to template.
- H. Do not exceed manufacturer's recommended unsupported overhang distances.
- I. Finish exposed surfaces smooth and polish to sheen specified.
- J. Windowsills: 1/2-inch-thick with eased edges.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. With Installer present, examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 1. Proceed with installation only after unsatisfactory conditions have been corrected in a manner acceptable to the Installer.
 - a. Beginning of installation means Installer accepts existing surface and/or substrate conditions.

3.2 INSTALLATION

SOLID SURFACE FABRICATIONS

- A. General: Install in accordance with manufacturer's written installation instructions.
 - 1. Install components plumb, level and rigid scribed to adjacent finishes.
 - 2. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.
 - a. Exposed joints/seams are not acceptable.
 - 3. Cut and finish component edges with clean, sharp returns.
 - 4. Rout radii and contours to template.
 - 5. Carefully dress joints smooth, remove surface scratches and clean entire surface.
- B. Window Sills: Install sills tight to window framing and adjacent wall surfaces. Anchor with concealed fastening system to securely prevent rocking, racking, or displacement. Seal joint between sill at adjacent wall and window surfaces with Sealant as specified in Division 07 Section "Joint Sealants."
- C. Tolerances:
 - 1. Maximum Variation From True Dimension: 1/8-inch
 - 2. Maximum Offset From True Position: 1/8-inch

3.3 REPAIR

- A. Replace damaged work which cannot be repaired to Architect's satisfaction.

3.4 CLEANING AND PROTECTION

- A. Cleaning:
 - 1. Clean and polish fabrications in accordance with manufacturer's instructions.
 - 2. Promptly remove excessive mastic and seam adhesive.
- B. Protection:
 - 1. Do not permit construction near unprotected surfaces.
 - 2. Refer to manufacturer's warranty and exclusions as stated herein.

END OF SECTION 066140

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SECTION 06 83 16 - FIBERGLASS REINFORCED PANELING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fiberglass reinforced plastic (FRP) wall panels.

1.2 RELATED REQUIREMENTS

- A. Section 07 92 00 – Joint Sealants.

1.3 REFERENCE STANDARDS

- A. ASTM International (ASTM) (www.astm.org):

1. ASTM D 2583 – Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.
2. ASTM D 5319 – Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels.
3. ASTM D 5420 – Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact).
4. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

- B. FM Global (FM) (www.fmglobal.com):

1. ANSI FM Approval 4880 – Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels, Interior Finish Materials or Coatings, and Exterior; Wall Systems.

- C. UL (www.ul.com):

1. UL 2818 – GREENGUARD Certification Program For Chemical Emissions For Building Materials, Finishes And Furnishings.

1.4 PREINSTALLATION MEETINGS

- A. Convene preinstallation meeting [1 week] before start of Work of this Section.
- B. Require attendance of parties directly affecting Work of this Section, including Contractor, Architect, installer, and manufacturer’s representative.
- C. Review the Following:
 1. Materials.
 2. Preparation.
 3. Installation.
 4. Field quality control.
 5. Adjusting.
 6. Cleaning.
 7. Protection.
 8. Coordination with other Work.

1.5 ACTION SUBMITTALS

- A. Comply with Division 01.
- B. Product Data: Submit manufacturer’s product data for each type of product required.

- C. Samples: Submit manufacturer's selection and verification samples for finish, colors, patterns, and textures.
 - 1. Submit 2 samples of each type of panel, trim, and fastener.
- D. Certificates: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
- E. Test and Evaluation Reports: Submit reports showing compliance with specified performance characteristics and physical properties.
- F. Manufacturer's Instructions: Submit manufacturer's installation and storage instructions.
- G. Manufacturer's Project References: Submit manufacturer's list of successfully completed FRP panel projects, including project name and location, name of architect, and type and quantity of FRP panels furnished.
- H. Installer's Project References: Submit installer's list of successfully completed FRP panel projects, including project name and location, name of architect, and type and quantity of FRP panels installed.

1.6 CLOSEOUT SUBMITTALS

- A. Comply with Division 01.
- B. Care and Maintenance Instructions: Submit manufacturer's care and maintenance instructions, including cleaning and repairing instructions.
- C. Warranty Documentation: Submit manufacturer's standard warranty.

1.7 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Manufacturer regularly engaged, for a minimum of 10 years, in the manufacturing of FRP panels of similar type to that specified.
- B. Installer's Qualifications:
 - 1. Installer regularly engaged, for a minimum of 5 years, in installation of FRP panels of similar type to that specified.
 - 2. Employ persons trained for installation of FRP panels.
- C. Mock-ups:
 - 1. Construct mock-up at project location where the actual installation is to take place.
 - 2. Obtain Architect approval and acceptance of finish, color, texture, pattern, trim, fasteners, and quality of installation.
 - 3. Mock-Up Size: 2 panels in width and from floor to ceiling at a location that encompasses a window.
 - 4. Maintain mock-up during construction for quality comparison.
 - 5. Mock-up shall be incorporated into final construction upon Architect approval.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Delivery Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage and Handling Requirements:
 - 1. Store and handle materials in accordance with manufacturer's instructions.
 - 2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
 - 3. Store materials in clean, dry area indoors at temperature and humidity conditions in accordance with manufacturer's instructions.

4. Store materials on flat, level surface, raised above floor, with adequate support to prevent sagging.
5. Store materials out of direct sunlight.
6. Protect materials and finish during storage, handling, and installation to prevent damage.

1.9 AMBIENT CONDITIONS

- A. Do Not Begin Installation Until:
 1. Building is enclosed.
 2. Residual moisture from plaster, concrete, or terrazzo has dissipated.
- B. During installation and within 48 hours before installation, maintain ambient temperature and relative humidity within limits required by type of FRP panel adhesive used and adhesive manufacturer's instructions.

1.10 WARRANTY

- A. Warranty Period: 1 year from date of purchase.
- B. Limited Warranty Period: Prorated years 2 to 10 from date of purchase.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
- B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified
- C. Substitutions: Comply with Division 01.
- D. Single Source: Provide FRP panels and accessories from single manufacturer.

2.2 FRP PANELS

- A. Fiberglass Reinforced Plastic Panels (FRP-1): Crane Composites “Designs Wall Panels IPSC”.
 - 1. Composition:
 - a. Reinforcement: Random chopped fiberglass.
 - b. Resin Mix: Polyester/styrene copolymer, inorganic fillers, and pigments.
 - 2. Certifications:
 - a. Class C: Meets minimum requirements of major model building codes for Class C interior wall and ceiling finishes of flame spread ≤ 200 , smoke developed ≤ 450 (per ASTM E-84).
 - b. Does not support mold or mildew (per ASTM D3273 and ASTM D3274).
 - c. Meets USDA/FSIS requirements.
 - 3. Use: Walls.
 - 4. Collection: see finish schedule
 - 5. Pattern: see finish schedule
 - 6. Surface Finish: Smooth.
 - 7. Scratch Resistance, ASTM D 2583, Barcol Hardness: 35.
 - 8. Abrasion Resistance, Taber Abrasion Test, CS-17 abrasive wheels with 1,000 g weight: Weight loss after 25 cycles of no more than 0.038 percent.
 - 9. Impact Strength, ASTM D 5420: 5.0 ft-lb/in notched (0.21 J/mm), showing no visible damage on finish side.
 - 10. Panel Surface Protection: Factory applied liquid hardener surface protection coating, ultraviolet light cured for impact, abrasion, and scratch resistance.
 - 11. Nominal Thickness: [0.075 inch (1.9 mm)].
 - 12. Wall Panel Size: [4 feet by 10 feet (1.2 m by 3 m)].
 - 13. Moldings, Trim, and Caps: 1-piece extruded polypropylene Designs series trims, configured to cover panel edges and corners, printed matching panel color and pattern.
 - 14. Color: Match FRP panel
- B. Fiberglass Reinforced Plastic Panels (FRP-2): Crane Composites Glasbord (PIF) with Surfaseal.
 - 1. Composition:
 - a. Reinforcement: Random chopped fiberglass.
 - b. Resin Mix: Polyester/styrene copolymer, inorganic fillers, and pigments.
 - 2. Certifications:
 - a. Class C: Meets minimum requirements of major model building codes for Class C interior wall and ceiling finishes of flame spread ≤ 200 , smoke developed ≤ 450 (per ASTM E-84).
 - b. Does not support mold or mildew (per ASTM D3273 and ASTM D3274).
 - c. Meets USDA/FSIS requirements.
 - 3. Use: Walls.
 - 4. Collection: see finish schedule
 - 5. Pattern: see finish schedule
 - 6. Surface Finish: Smooth with Surfaseal.

7. Scratch Resistance, ASTM D 2583, Barcol Hardness: 27.
8. Abrasion Resistance, Taber Abrasion Test, CS-17 abrasive wheels with 1,000 g weight: Weight loss after 25 cycles of no more than 0.01 percent.
9. Impact Strength, ASTM D 5420: 11.0 ft-lb/in notched (3.4 J/mm), showing no visible damage on finish side.
10. Panel Surface Protection: Factory applied molecularly bonded Surfaseal surface protection film for fiberglass reinforced plastic (FRP) panels.
11. Nominal Thickness: [0.075 inch].
12. Wall Panel Size: [4 feet by 10 feet (1.2 m by 3 m)].
13. Moldings, Trim, and Caps: 1-piece extruded polypropylene Glasbord series trims, configured to cover panel edges and corners.
14. Color: Match FRP panel

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive FRP panels.
- B. Examine Substrate Surfaces to Determine:
 - 1. Corners: Plumb and straight.
 - 2. Surfaces: Smooth, sound, and uniform.
 - 3. Nails or Screw Fasteners: Countersunk.
 - 4. Joints and Cracks: Filled flush and smooth with adjoining surfaces.
- C. Notify Architect of conditions that would adversely affect installation or subsequent use.
- D. Do not begin preparation or installation until unacceptable conditions are corrected.

3.2 PREPARATION

- A. Clean substrates to remove substances that could impair bond of adhesive, including oil, grease, dirt, dust, or other contaminants.
- B. Acclimate FRP panels by unpacking and placing in installation space a minimum of 24 hours before installation.
- C. Lay out FRP panels before beginning installation.
 - 1. Locate panel joints to provide equal panel widths at ends of walls.
 - 2. Locate panel joints to provide trimmed panels at corners a minimum of 12 inches (300 mm) wide.

3.3 INSTALLATION

- A. Install FRP panels in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Install FRP panels plumb, level, square, flat, and in proper alignment.
- C. Install FRP panels to be water resistant and washable.
- D. Install FRP panels with manufacturer's recommended gap for panel field and corner joints.
- E. Fasteners:
 - 1. Use fasteners in accordance with manufacturer's instructions to install FRP panels securely to supports.
 - 2. Pre-drill fastener holes in FRP panels, 1/8 inch (3.2 mm) greater in diameter than fasteners.
- F. Adhesive:
 - 1. Install FRP panels in full spread of adhesive.
 - 2. Follow adhesive manufacturer's instructions for application of adhesive.
- G. Install trim accessories with adhesive and nails or staples.
 - 1. Do not fasten through FRP panels.
- H. Sealant:
 - 1. Fill grooves in trim accessories with sealant before installing FRP panels.
 - 2. Bed inside corner trim in bead of sealant.
 - 3. Remove excess sealant and smears as FRP panels are installed.

4. Clean in accordance with sealant manufacturer's instructions.

I. Tolerances: Install FRP panels within manufacturer's installation tolerances.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Services: If requested by Owner, provide manufacturer's field service consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

1. Site Visits: 2.

3.5 ADJUSTING

A. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.

B. Remove and replace with new material, damaged components that cannot be successfully repaired, as determined by Architect.

3.6 CLEANING

A. Clean FRP panels promptly after installation in accordance with manufacturer's instructions.

B. Do not use harsh cleaning materials or methods that could damage finish.

3.7 PROTECTION

A. Protect installed FRP panels and finish surfaces from damage during construction.

END OF SECTION 06 83 16

DIVISION 07 THERMAL AND MOISTURE PROTECTION

SECTION 07 21 00 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Polyisocyanurate foam-plastic board.
 - 2. Glass-fiber blanket – Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.
 - 3. Glass-fiber board insulation at cavity wall construction.
- B. Related Requirements:
 - 1. Section 042000 "Unit Masonry" for insulation installed in masonry cells.
 - 2. Section 072129 "Sprayed Cellulose Thermal Insulation" for spray-applied cellulose foam insulation.
 - 3. **[Section 092900 "Gypsum Board"]** for sound attenuation blanket used as acoustic insulation.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include product characteristics, performance criteria, and product limitations.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- B. Evaluation Reports: For foam-plastic insulation, from ICC-ES.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

1.5 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.
- B. Protect foam-plastic board insulation as follows:

1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.
4. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 - PRODUCTS

2.1 POLYISOCYANURATE FOAM-PLASTIC BOARD

- A. Polyisocyanurate Board, Glass-Fiber-Mat Faced: ASTM C 1289, glass-fiber-mat faced, Type II, Class 1 or 2.
 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
 2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
- B. Extruded polystyrene board; Type ASTM C578; with either natural skin or cut cell surfaces, and the following characteristics:
 1. Compliances: UL, WH or FM listed under Roofing Systems
 2. Federal Specification: HH-I-1972.
 3. Qualities: Rigid, closed cell polyisocyanurate foam core bonded to felt or glass heavy duty fiber mat facers.
 4. R-value: 1 inch of material at 72 degrees F; 4.1, minimum – refer to drawings.
 5. Board Edges: Square.
 6. Compressive Resistance: 25 psi.
 7. Board Density: 1.3 lb/cu ft.
 8. Water Absorption, Maximum: 0.3 percent, by volume.
- C. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
 1. Complies with fire resistance requirements shown on the drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285
 - a. Flame Spread Index: 75 or less, when tested in accordance with ASTM E84.
 - b. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.

2.2 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 and Products:>
 - a. CertainTeed Corporation: www.certainteed.com.
 - b. Johns Manville: www.jm.com.
 - c. Owens Corning Corp: www.owenscorning.com.

- B. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
 2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
 3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
 4. Formaldehyde Content: Zero.
 5. Thickness: As indicated on Construction Documents.
 6. Substitutions: See Section 016000 - Product Requirements.
- B. Glass-Fiber Blanket, Kraft Faced <Insert drawing designation>: ASTM C 665, Type II (nonreflective faced), Class C (faced surface not rated for flame propagation); Category 1 (membrane is a vapor barrier).
- C. Glass-Fiber Blanket, Foil Faced <Insert drawing designation>: ASTM C 665, Type III (reflective faced), Class B (faced surface with a flame-propagation resistance of 0.12 W/sq. cm); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.

2.3 MINERAL-WOOL BLANKETS

- A. Mineral-Wool Blanket, Unfaced: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; 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 and Products:>
 - a. Johns Manville; MinWool Sound Attenuation Fire Batts: www.jm.com.
 - b. Thermafiber, Inc.; SAFB: www.thermafiber.com.
 - c. ROXUL, Inc; ComfortBatt: www.roxul.com.

2.4 SPRAY-APPLIED CELLULOSIC INSULATION

- A. Self-Supported, Spray-Applied Cellulosic Insulation: ASTM C 1149, [Type I (materials applied with liquid adhesive; suitable for either exposed or enclosed applications),] chemically treated for flame-resistance, processing, and handling characteristics.
1. <Manufacturers and Products:>
 - a. International Cellulose Corporation
12315 Robin Boulevard, Houston, Texas 77045
(713) 433-6701 or (800) 444-1252
www.spray-on.com and icc@spray-on.com
 - b. For approved applicators contact ICC at 800-444-1252

2.5 INSULATION FASTENERS

- A. General: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.
- B. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position with self-locking washer in place.

1. Plate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
 2. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation.
- C. Adhesively Attached, Angle-Shaped, Spindle-Type Anchors: Angle welded to projecting spindle; capable of holding insulation of specified thickness securely in position with self-locking washer in place.
1. Intended for attaching insulation to mullions while preventing it from touching spandrel glass
 2. Angle: Formed from 0.030-inch- thick, perforated, galvanized carbon-steel sheet with each leg 2 inches square.
 3. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation.
 4. If stainless steel or another metal is used, “Angle” and “Spindle” requirements are different from those listed above.
- D. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick galvanized-steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches square or in diameter.
1. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in the following locations:
 - a. Crawl spaces.
 - b. Ceiling plenums.
 - c. Attic spaces.
 - d. <Where sharp ends of spindles would be exposed to human contact>.
- E. Insulation Standoff: Spacer fabricated from galvanized mild-steel sheet for fitting over spindle of insulation anchor to maintain air space between face of insulation and substrate to which anchor is attached.
- F. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates without damaging insulation, fasteners, or substrates.

2.6 ACCESSORIES

- A. Insulation for Miscellaneous Voids:
1. For enhanced thermal protection or air-infiltration reduction.
 2. Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.
 3. Spray Polyurethane Foam Insulation: ASTM C 1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, 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.
1. Type recommended by insulation manufacturer for application.
- C. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inch wide.
1. Tape joints of rigid insulation in accordance with roofing and insulation manufacturers' instructions.

- D. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide ventilation between insulated attic spaces and vented eaves.
 - 1. For vented eaves in attics to receive blanket insulation.

PART 3 - EXECUTION

3.1 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.
- B. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
- C. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.2 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.

3.3 INSTALLATION OF SLAB INSULATION

- A. On vertical slab edge and foundation surfaces, set insulation units using manufacturer's recommended adhesive according to manufacturer's written instructions.
 - 1. If not otherwise indicated, extend insulation a minimum of [24 inches] below exterior grade line.
- B. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.
 - 1. If not otherwise indicated, extend insulation a minimum of [24 inches] in from exterior walls.

3.4 INSTALLATION OF FOUNDATION WALL INSULATION

- A. Butt panels together for tight fit.
- B. Anchor Installation: Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:
 - 1. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application.
 - 2. Apply insulation standoffs to each spindle to create cavity width indicated on Drawings between concrete substrate and insulation.
 - 3. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation.
 - 4. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.
- C. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing according to manufacturer's written instructions.
 - 1. Apply adhesive to back of boards:
 - a. Three continuous beads per board length.
 - 2. Install boards horizontally on foundation perimeter.
 - a. Place boards to maximize adhesive contact.
 - b. Install in running bond pattern.
 - c. Butt edges and ends tightly to adjacent boards and to protrusions.
 - 3. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
 - 4. Immediately following application of board insulation, place protective boards over exposed insulation surfaces.
 - a. Apply adhesive in five continuous beads per board length.
 - b. Install boards horizontally from base of foundation to top of insulation.
 - c. Butt boards tightly, with joints staggered from insulation joints.

3.5 INSTALLATION OF CAVITY-WALL INSULATION

- A. Foam-Plastic 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.
 - 1. Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose and specified in Section 042000 "Unit Masonry."
 - a. For when insulation does not fill cavity.
- B. Install boards to fit snugly between wall ties.
 - 1. Place membrane surface against adhesive.
 - 2. Place membrane surface facing out, and tape seal board joints.
- C. Install boards horizontally on walls.

1. Place boards to maximize adhesive contact.
 2. Install in running bond pattern.
 3. Butt edges and ends tightly to adjacent boards and to protrusions.
 4. Place impale fastener locking discs.
- D. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
1. Cellular-Glass Board Insulation: Install with closely fitting joints using **[adhesive pad]** **[serrated trowel]** attachment method according to manufacturer's written instructions.

3.6 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Batt Installation in General
1. Coordinate work of this section with requirements for vapor retarder specified in Section 072500.
 2. Coordinate work of this section with construction of air barrier seal specified in Section 072500.
- B. 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. Trim insulation neatly to fit spaces.
 2. Insulate miscellaneous gaps and voids. 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. Attics: Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
 5. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
 6. For metal-framed wall cavities where cavity heights exceed **96 inches**, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
 7. For wood-framed construction, install blankets according to ASTM C 1320 and as follows:
 - a. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.
 8. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings and seal each continuous area of insulation to ensure airtight installation.
 - a. Exterior Walls: Set units with facing placed toward **[as indicated on Drawings]** based on vapor-flow analysis of the construction assembly.
 - b. Interior Walls: Set units with facing placed **[toward areas of high humidity]** for all interior walls around high-humidity areas such as shower rooms.
- C. 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.**
 2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

- D. Spray-Applied Cellulosic Insulation: Apply spray-applied insulation according to manufacturer's written instructions. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked. After insulation is applied, make flush with face of studs by using method recommended by insulation manufacturer.

3.7 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 07 21 00

SECTION 07 25 00 - WEATHER BARRIERS / VAPOR RETARDERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes **Weather Barriers**: Assemblies that form either air barriers or water-resistive barriers.
 - 1. Air Barrier: Airtight barrier made of material that is relatively air impermeable but water vapor permeable, both to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.
 - 2. Water-Resistive Barrier: Water-shedding barrier made of material that is moisture resistant, to the degree specified, intended to be installed to shed water without sealed seams.
 - 3. Weather barrier type materials:
 - a. Building paper.
 - b. Building wrap.
 - c. Flexible flashing.
 - d. Drainage material.
- B. Section Includes **Vapor Retarders**: Assembly that forms vapor impermeable air barriers.
 - a. Polyethylene vapor retarders.
 - b. Reinforced-polyethylene vapor retarders.
 - c. Fire-retardant, reinforced-polyethylene vapor retarders.
- C. Related Requirements:
 - 1. Section 033000 "Cast-in-Place Concrete" for under-slab vapor retarders.
 - 2. Section 072100 "Thermal Insulation" for vapor retarders integral with insulation products.

1.3 REFERENCE STANDARDS

- A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2006a (Reapproved 2013).
- B. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2015a.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- D. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2014.
- E. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials; 2013.

- F. ICC-ES AC212 - Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing; ICC Evaluation Service, Inc.; 2015.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. For building wrap, include data on air and water-vapor permeance based on testing according to referenced standards.
- B. Shop Drawings:
 - 1. Provide drawings of special joint conditions.
 - 2. Show details of building [paper] [wrap] at terminations, openings, and penetrations.
 - 3. Show details of flexible flashing applications.
- C. Manufacturer's Installation Instructions: Indicate preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- B. Evaluation Reports: For [water-resistive barrier] [and] [flexible flashing], from ICC-ES.

1.6 FIELD CONDITIONS

- A. Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.

PART 2 - PRODUCTS

2.1 MANUFACTURES

A. Products:

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

2.2 WEATHER BARRIER ASSEMBLIES

A. Air Barrier:

1. On outside surface of sheathing of exterior walls use air barrier coating.
2. Air Barrier Coating:
 - a. Material: Acrylic.
 - b. Acceptable Substrates: Stated by manufacturer as suitable for installation on visibly damp surfaces and concrete that has hardened but is not fully cured ("green" concrete) without requiring a primer.
 - c. Adhesion to Paper and Glass Mat Faced Sheathing: Sufficient to ensure failure due to delamination of sheathing.
 - d. Dry Film Thickness (DFT): 40 mils.
 - e. Elongation: 300 percent, minimum, when tested in accordance with ASTM D412.
 - f. Nail Sealability: Pass, when tested in accordance with ASTM D1970/D1970M.
 - g. Water-Vapor Permeance: Not less than [10 perms] per ASTM E 96/E 96M, Desiccant Method.
 - h. Air Permeance: Not more than 0.004 cfm/sq. ft. at 0.3-inch wg when tested according to ASTM E 2178.
 - i. Ultraviolet and Weathering Resistance: Approved in writing by manufacturer for minimum of 6 months weather exposure.
 - j. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.
 - k. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

B. Water Resistive Barrier (Water Vapor Permeable and Water Resistive):

1. Building Paper: ASTM D 226, Type 1 (No. 15 asphalt-saturated organic felt), unperforated.
2. Building Wrap: ASTM E 1677, Type I air barrier; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; UV stabilized; and acceptable to authorities having jurisdiction.
3. Building-Wrap Tape: Pressure-sensitive plastic tape recommended by building-wrap manufacturer for sealing joints and penetrations in building wrap.

2.3 FLEXIBLE FLASHING

- A. Butyl Rubber 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 [0.040 inch].
- B. Rubberized-Asphalt Flashing: Composite, self-adhesive, flashing product consisting of a pliable, rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than [0.040 inch].
- C. Primer for Flexible Flashing: Product recommended in writing by flexible flashing manufacturer for substrate.
- D. Nails and Staples: Product recommended in writing by flexible flashing manufacturer and complying with ASTM F 1667.
- E. Thinners and Cleaners: As recommended by material manufacturer.

2.4 DRAINAGE MATERIAL

- A. Drainage Material: Product shall maintain a continuous open space between water-resistive barrier and exterior cladding to create a drainage plane and shall be used under [siding], [portland cement plaster], and [adhered masonry veneer].

2.5 POLYETHYLENE VAPOR RETARDERS

- A. Polyethylene Vapor Retarders: ASTM D 4397, [**10-mil-** (0.25-mm-)] thick sheet, with maximum permeance rating of **0.1 perm**.

2.6 REINFORCED-POLYETHYLENE VAPOR RETARDERS

- A. Reinforced-Polyethylene Vapor Retarders: Sheet with outer layers of polyethylene film laminated to an inner reinforcing layer consisting of either nylon cord or polyester scrim and weighing not less than [**20 lb/1000 sq. ft.**], with maximum permeance rating of **0.1 perm**.

2.7 FIRE-RETARDANT, REINFORCED-POLYETHYLENE VAPOR RETARDERS

- A. Fire-Retardant, Reinforced-Polyethylene Vapor Retarders: Sheet with outer layers of polyethylene film laminated to an inner reinforcing layer consisting of either nonwoven grid of nylon cord or polyester scrim and weighing not less than [**20 lb/1000 sq. ft.**], with maximum permeance rating of **0.1 perm**.

1. Surface-Burning Characteristics: Maximum flame-spread and smoke-developed indexes of [**75 and 200**], respectively, per ASTM E 84.

2.8 VAPOR RETARDER ACCESSORIES

- A. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

- B. Adhesive for Vapor Retarders: Product recommended by vapor-retarder manufacturer and has demonstrated capability to bond vapor retarders securely to substrates indicated.
- C. Vapor-Retarder Fasteners: Pancake-head, self-tapping steel drill screws; with fender washers.

PART 3 - EXECUTION

3.1 WEATHER BARRIER INSTALLATION PREPARATION

- A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
- B. Clean and prime substrate surfaces to receive adhesives in accordance with manufacturer's instructions.
 - 1. Apply sealants and adhesives within recommended application temperature ranges. Consult manufacturer if temperature is out of this range.

3.2 AIR BARRIER INSTALLATION

- A. Install continuous airtight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
- B. Coatings:
 - 1. Prepare substrate in manner recommended by coating manufacturer; treat joints in substrate and between dissimilar materials as recommended by manufacturer.
 - 2. Where exterior masonry veneer is to be installed, install masonry anchors before installing weather barrier over masonry; seal around anchors airtight.
 - 3. Mastic Coating: Install by trowel or roller to minimum thickness of 1/4 inch; use sheet seal to join to adjacent construction, seal airtight with sealant. Use flashing to seal to adjacent construction and to bridge joints.

3.3 WATER-RESISTIVE BARRIER INSTALLATION

- A. Cover exposed exterior surface of sheathing with water-resistive barrier securely fastened to framing immediately after sheathing is installed.
- B. Cover sheathing with water-resistive barrier as follows:
 - 1. Cut back barrier **1/2 inch** on each side of the break in supporting members at expansion- or control-joint locations.
 - 2. Apply barrier to cover vertical flashing with a minimum **4-inch** overlap unless otherwise indicated.
- C. Building Paper: Apply horizontally with a **2-inch** overlap and a **6-inch** end lap; fasten to sheathing with galvanized staples or roofing nails.
- D. Building Wrap: Comply with manufacturer's written instructions and warranty requirements.
 - 1. Seal seams, edges, fasteners, and penetrations with tape.

2. Extend into jambs of openings and seal corners with tape.

E. Openings and Penetrations in Exterior Weather Barriers:

1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches onto weather barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
2. At openings to be filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with at least 4 inches wide; do not seal sill flange.
3. At openings to be filled with non-flanged frames, seal weather barrier to all sides of opening framing, using flashing at least 9 inches wide, covering entire depth of framing.
4. At head of openings, install flashing under weather barrier extending at least 2 inches beyond face of jambs; seal weather barrier to flashing.
5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
6. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface.

3.4 FLEXIBLE FLASHING INSTALLATION

A. Apply flexible flashing where indicated to comply with manufacturer's written instructions.

1. Prime substrates as recommended by flashing manufacturer.
2. Lap seams and junctures with other materials at least 4 inches (100 mm) except that at flashing flanges of other construction, laps need not exceed flange width.
3. Lap flashing over water-resistive barrier at bottom and sides of openings.
4. Lap water-resistive barrier over flashing at heads of openings.
5. After flashing has been applied, roll surfaces with a hard rubber or metal roller to ensure that flashing is completely adhered to substrates.

3.5 DRAINAGE MATERIAL INSTALLATION

A. Install drainage material over building wrap and flashing to comply with manufacturer's written instructions.

3.6 VAPOR RETARDER INSTALLATION PREPARATION

A. Clean substrates of substances that are harmful to vapor retarders, including removing projections capable of puncturing vapor retarders.

3.7 INSTALLATION OF VAPOR RETARDERS ON FRAMING

A. Place vapor retarders on side of construction indicated on Drawings.

B. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives, vapor retarder fasteners, or other anchorage system as recommended by manufacturer. Extend vapor retarders to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.

- C. Seal vertical joints in vapor retarders over framing by lapping no fewer than two studs and sealing with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Locate all joints over framing members or other solid substrates.
- D. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.
- E. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders.

3.8 INSTALLATION OF VAPOR RETARDERS IN CRAWL SPACES

- A. Install vapor retarders over prepared grade. Lap joints a minimum of **12 inches** and seal with manufacturer's recommended tape. Install second layer over pathways to equipment.
- B. Extend vapor retarder over footings and seal to foundation wall or grade beam with manufacturer's recommended tape.
 - 1. Extend vapor retarder vertically minimum **[24 inches]** above top of footing.
- C. Seal around penetrations such as utilities and columns in order to create a monolithic, airtight membrane at grade surface, perimeter, and all vertical penetrations.

3.9 FIELD QUALITY CONTROL

- A. Do not cover installed weather barriers until required inspections have been completed.
- B. Obtain approval of installation procedures by the weather barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.
- C. Take digital photographs of each portion of the installation prior to covering up.

3.10 PROTECTION

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.
- B. Do not leave paper- or felt-based barriers exposed to weather for longer than one week.
- C. Protect vapor retarders from damage until concealed by permanent construction.

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SECTION 07 41 13.16 - STANDING-SEAM METAL ROOF PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:
 - 1. Factory-formed and field assembled, standing-seam metal roof panels.
 - 2. Roof insulation
- B. Related Sections:
 - 1. Section 074293 "Soffit Panels" for horizontal wood soffit applications.
 - 2. Section 079200 "Joint Sealants" for field-applied sealants not otherwise specified in this Section.
 - 3. Section 071326 "Self - Adhering moisture Barrier",

1.3 DEFINITIONS

- A. Metal Roof Panel Assembly: Metal roof panels, attachment system components, miscellaneous metal framing, thermal insulation, and accessories necessary for a complete weathertight roofing system.
- B. Solar Flux: Direct and diffuse radiation from the sun received at ground level over the solar spectrum, expressed in watts per square meter.
- C. Solar Reflectance: Fraction of solar flux reflected by a surface, expressed as a percent or within the range of 0.00 and 1.00.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide metal roof panel assemblies that comply with performance requirements specified as determined by testing manufacturers' standard assemblies similar to those indicated for this Project, by a qualified testing and inspecting agency.
- B. Air Infiltration: Provide roof panel system not to exceed the following air leakage rates when tested in accordance with ASTM E283;
 - 1. Pressure Leakage Rate
 - a. 1.57 PSF 0.0007 cfm/sq.ft.
 - b. 6.24 PSF 0.0002 cfm/sq.ft.
 - c. 20.0 PSF 0.0036 cfm/sq.ft.

- C. Water Penetration: No water penetration when tested according to ASTM E 331.
- D. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift resistance class indicated Shop Drawings.
- E. Fire/Windstorm Classification: Class 1A-120.
- F. Structural Performance: Provide metal roof panel assemblies capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 330:
 - 1. Wind Loads: Determine loads based on the following minimum design wind pressures indicated in the Drawings.
 - 2. Uniform pressure as indicated on the Drawings.
- G. Thermal Movements: Provide metal roof panel assemblies that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F (67 deg C), ambient, material surfaces.
- H. Thermal Performance: Provide insulated metal roof panel assemblies with thermal-resistance value (R-value) indicated when tested according to ASTM C 236 or ASTM C 518.
- I. Solar Reflectance for Roofs with Slopes Steeper Than 2:12: Initial solar reflectance of not less than 0.25 when tested according to ASTM E 903, and maintained, under normal conditions, solar reflectance not less than 0.15 for 3 years after installation.

1.5 ACTION SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal roof panel and accessory.
- B. Shop Drawings:
 - 1. Provided by manufacturer, all sheets on manufacturer's title block.
 - 2. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
 - 3. Clip spacing fastening patterns for corner, perimeter, and field-of-roof locations.
 - 4. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
 - 5. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.
 - 6. Scaled Roof Plan showing keyed details, wind zone hatching.
- C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Metal Roof Panels: 16 inches long by actual panel width. Include fasteners, clips, closures, and other metal roof panel accessories.
 2. Trim and Closures: Include fasteners and other exposed accessories.
 3. Accessories: Samples for each type of accessory.
- D. Field quality-control reports.
- E. Sample Warranties: For special warranties.
- F. Section 01360 – Manufacturer Warranty Certification
1. Submit manufacturer's signed warranty certification document integrating warranty with project conditions.
- G. Copy of Manufacturer's approved contractor letter, specific to this project.
- 1.6 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For Installer.
 - B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
 - C. Material Certificates: For thermal insulation, from manufacturer.
- 1.7 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For metal panels to include in maintenance manuals.
- 1.8 WARRANTY
- 1.9 QUALITY ASSURANCE
- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
 1. Contractor shall provide copy of manufacturer's certification letter.
 2. Installer's responsibilities include fabricating and installing metal roof panel assemblies and providing professional engineering services needed to assume engineering responsibility.
 3. Engineering Responsibility: Preparation of data for metal roof panels, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
 4. Source Limitations: Obtain each type of metal roof panels through one source from a single manufacturer.
 5. Product Options: Drawings indicate size, profiles, and dimensional requirements of metal roof panels and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."
 6. Manufacturer shall visit jobsite minimum three days per week and issue progress reports within 3 days of site visit.

- B. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of work.
1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency.
 2. Surface-Burning Characteristics: Provide insulated metal roof panels having insulation core material with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - a. Flame-Spread Index: 25 or less, unless otherwise indicated.
 - b. Smoke-Developed Index: 450 or less, unless otherwise indicated.
 3. Metal roof panels shall be identified with appropriate markings of applicable testing and inspecting agency.
 4. Minimum 15-stage roll forming equipment shall be used to minimize oil canning.

1.10 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. Protect strippable protective covering on metal roof panels from exposure to sunlight and high humidity, except to extent necessary for period of metal roof panel installation.
- E. Protect foam-plastic insulation as follows:
1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
 2. Protect against ignition at all times. Do not deliver foam-plastic insulation materials to Project site before installation time.
 3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

1.11 FIELD CONDITIONS

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

- B. Field Measurements: Verify locations of roof framing and roof opening dimensions by field measurements before metal roof panel fabrication and indicate measurements on Shop Drawings.
- C. Established Dimensions: Where field measurements cannot be made without delaying the Work, either establish framing and opening dimensions and proceed with fabricating metal roof panels without field measurements or allow for field-trimming of panels. Coordinate roof construction to ensure that actual building dimensions, locations of structural members, and openings correspond to established dimensions.

1.12 COORDINATION

- A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.
- B. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.13 WARRANTY

- A. Manufacturer's System, Labor and Materials, Non-Prorated, Single Source: The manufacturer shall warranty that the roofing system shall remain intact (without perceptible deformation) and leak free for a period of 30-years from the date of project Substantial Completion up to IBC design pressures, with panels repaired or replaced as needed.
 - 1. Structural failures including rupturing, cracking, or puncturing.
 - 2. Deterioration of metals and other materials beyond normal weathering.
 - 3. Manufacturer shall execute a single warranty covering of the following criteria. Multiple-source warranties are not acceptable.
 - 4. Manufacturer's thirty (30) year watertight warranty, including coverage for all trim, flashings, curbs and penetrations associated with the roof area.
 - 5. Warranty shall commence on date of substantial completion [or final payment], whichever is agreed by contract.
 - 6. Installer shall provide manufacturer with a two (2) year warranty covering roofing system installation and water tightness.
 - 7. Warranty shall contain no provisions for "blanket voiding" (permanent cancellation).
 - 8. Warranty shall not charge owner for leak calls for any reason.
 - 9. Warranty shall not require a manufacturer's maintenance program and only routine maintenance such as cleaning debris shall be necessary.
- B. Paint Finish Warranty: 20 years minimum from the date of Substantial Completion.
 - 1. Failures include, but are not limited to, chalking, cracking, deforming, fading or otherwise deteriorating beyond normal weathering, and as otherwise indicated.
 - 2. Fading is defined as loss of color, after cleaning with product recommended by manufacturer, of more than 4 color-difference units as measured according to ASTM D2244, and as otherwise indicated.
 - 3. Chalking is defined as being in excess of a No. 8 rating when tested according to ASTM D 4214.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:
1. Wind Loads: **As indicated on Drawings.**
 2. Other Design Loads: **As indicated on Drawings.**
 3. Deflection Limits: For wind loads, no greater than **[1/180]** of the span.
- B. Air Infiltration: Air leakage of not more than 0.0011 cfm/sq. ft. when tested according to ASTM E 1680 **[or ASTM E 283]** at the following test-pressure difference:
1. Test-Pressure Difference: **20.0 lbf/sq. ft**
- C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 1646 **[or ASTM E 331]** at the following test-pressure difference:
1. Test-Pressure Difference: **20.0 lbf/sq. ft.**, as indicated by Structural Engineer.
- D. Hydrostatic-Head Resistance: No water penetration when tested according to ASTM E 2140 at six inch (6") water depth.
- E. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
1. Uplift Rating: **UL 90**, as indicated by Structural Engineer.
- F. FM Global Listing: Provide metal roof panels and component materials that comply with requirements in FM Global 4471 as part of a panel roofing system and that are listed in FM Global's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.
1. Fire/Windstorm Classification: Class 1A-.
 2. Hail Resistance: MH.
- G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 STANDING-SEAM METAL ROOF PANELS

- A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips inside laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.

1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1514.
- B. Vertical-Rib, Seamed-Joint, Standing-Seam Metal Roof Panels : Formed with vertical ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels, engaging opposite edge of adjacent panels, and mechanically seaming panels together.
1. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, G90 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Nominal Thickness: 0.024 or 0.028 inch, per wind uplift requirements.
 - b. Exterior Finish: [see finish schedule](#)
 - c. Color: [see finish schedule](#)
 - d. Clips: One-piece floating to accommodate thermal movement.
 - e. Material: Zinc-coated (galvanized) with Kynar or approved equal finish
 - f. Joint Type: "T" Seam
 - g. Panel Width: 16 inches.
 - h. Panel Height: 2-3/8 inches.

2.3 BEARING PLATES

- A. Three inch by five inch (3" x 5"), sixteen (16) gauge bearing plates with predrilled holes.

2.4 CONTINUOUS AIR BARRIER

- A. Direct to Deck, provide self-adhering, cold-applied, high-temperature sheet underlayment, a minimum of 40 mils thick, consisting of slip-resistant, polyethylene-film top surface laminated to a layer of butyl or SBS-modified asphalt adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.
 1. Thermal Stability: Stable after testing at 240 deg F; ASTM D 1970.
 2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F; ASTM D 1970.
- B. Above Roof Insulation, install self-adhering vapor permeable air barrier per manufacturer's instructions.
 1. Water vapor transmission ASTM E96-05, Proc. A 214 g/m²/24h
 2. Vapor permeance ASTM E96-05, Proc. A 31 perms
 3. Air permeance ASTM E2178 Pass
 4. [Manufacturers:](#)
 - a. Carlisle Residential, a division of Carlisle Construction Materials; WIP 300HT.
 - b. Grace Construction Products, a unit of W. R. Grace & Co.; Grace Ice and Water Shield HT.
 - c. Owens Corning; WeatherLock Metal High Temperature Underlayment.
 - d. Garland; RmerSeal self-adhering membrane.
 - e. As required by metal panel manufacturer.

2.5 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C 645; cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 coating designation or ASTM A 792/A 792M, Class AZ50 coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- B. Panel: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
1. Closures: Provide prefabricated metal and neoprene closures at eaves and ridges of same metal as metal panels. Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
 2. Continuous Panels: Panels shall be continuous from ridge to eave, with no end laps allowed unless pre-approved.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
- D. Gutters: Formed from same material as roof panels, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- long sections, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Furnish gutter supports spaced a maximum of 36 inches o.c., fabricated from same metal as gutters. Provide wire ball strainers of compatible metal at outlets. Finish gutters to match **metal roof panels**.
- E. Downspouts: Formed from same material as roof panels. Fabricate in 10-foot- long sections, complete with formed elbows and offsets, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." [same as above] Finish downspouts to match gutters. Straps installed every ten feet (10') and at all joints.
- F. Roof Curbs: Fabricated from same material as roof panels, **[0.048-inch]** nominal thickness; with bottom of skirt profiled to match roof panel profiles and with welded top box and integral full-length cricket. Fabricate curb subframing of 0.060-inch- nominal thickness, angle-, C-, or Z-shaped steel sheet. Fabricate curb and subframing to withstand indicated loads of size and height indicated. Finish roof curbs to match metal roof panels.
1. Insulate roof curb with 1-inch- thick, rigid insulation.
 2. Roof curb shall be integrated into the roof system wrapped in same metal type, finish and gauge as roof panels per manufacturer's details, no exposed fasteners through panel-pan, full coverage under warranty.
- G. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with heads matching color of metal roof panels by means of plastic caps or factory-applied coating.
1. Fasteners for Roof Panels:

- a. Self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws, with a stainless-steel cap or zinc-aluminum-alloy head and EPDM or neoprene sealing washer.
 - b. Self-drilling or self-tapping 410 stainless or zinc-alloy steel hex washer head, with EPDM or PVC washer under heads of fasteners bearing on weather side of metal roof panels.
 - c. No exposed fasteners in the roof panel except plumbing boots.
 - d. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head. No exposed fasteners in the sheet metal trim except inside vertical faces for Jamb and Rakes.
2. Blind Fasteners: High-strength aluminum or stainless-steel rivets.
- H. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1 inch [changed from 1/2"] wide and 1/8 inch thick.
 2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.6 FABRICATION

- A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.
1. Minimum 15-stage roll forming equipment shall be used to minimize oil canning.
- C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- D. Fabricate metal 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.
- E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal panel manufacturer for application, but not less than thickness of metal being secured.

2.7 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
 1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
 2. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.
- B. Install water-resistive barriers directly over sheathing.**
 - 1) Install vapor permeable (breathable) air barrier over roof insulation as for temporary watertightness.**
- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.
1. Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.
 2. All self-adhering moisture proofing membrane to cover the roof deck shall be in place prior to installation of standing seam roof assembly.
 3. Install flashings and other sheet metal to comply with requirements specified in Division 7 Section "Sheet Metal Flashing and Trim."
 4. Install fasciae and copings to comply with requirements specified in Division 7 Section "Sheet Metal Flashing and Trim."
 5. Miscellaneous Framing: Install subpurlins, eave angles, furring, and other miscellaneous roof panel support members and anchorage according to metal roof panel manufacturer's written recommendations.
 6. Soffit Framing: Wire-tie or clip furring channels to supports, as required to comply with requirements for assemblies indicated.

3.3 THERMAL INSULATION INSTALLATION

- A. Coordinate installing roofing system components, so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.
- D. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- E. Mechanically Fastened and Adhered Insulation: Install first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
1. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof.
 2. Set each subsequent layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
- F. 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 (150 mm) in each direction. Loosely butt cover boards together and adhere to insulation.
1. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.

3.4 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated **below**, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. **Extend underlayment over roof edge**. Roll laps with roller. Cover underlayment within **30** days.
 - 1. Apply over the roof area indicated below:
 - a. Field, perimeters, and all roof penetrations.
- B. Flashings: Install flashings to cover underlayment to comply with requirements specified in this section and Section 076200 "Sheet Metal Flashing and Trim."

3.5 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. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
 - 3. Locate and space fastenings in uniform vertical and horizontal alignment.
 - 4. Install flashing and trim as metal panel work proceeds.
 - 5. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 - 6. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
 - 7. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
- B. Fasteners:
 - 1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
- C. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners through bearing plates according to manufacturers' written instructions.
- D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- E. Field Assembled Standing-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.
 - 1. Install clips to supports with self-tapping fasteners.
 - 2. Install pressure plates at locations indicated in manufacturer's written installation instructions.

3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.
4. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel, and factory-applied sealant are completely engaged.
5. Watertight Installation:
 - a. Apply a continuous ribbon of sealant or tape to seal joints of metal panels, using sealant or tape as recommend in writing by manufacturer as needed to make panels watertight.
 - b. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
 - c. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.

3.6 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
 1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal roof panel manufacturers; or, if not indicated, types recommended by metal roof panel manufacturer.
- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
 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 sheet metal flashing and trim to fit substrates and achieve waterproof and weather-resistant performance.
 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
- C. Gutters: Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than 36 inches o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.
- D. Downspouts: Join sections with telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.
 1. Provide elbows at base of downspouts to direct water away from building.
 2. Connect downspouts to underground drainage system indicated.
- E. Roof Curbs: Install flashing around bases where they meet metal roof panels.

- F. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to metal roof panels as recommended by manufacturer.

3.7 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal panel units within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.8 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect metal roof panel installation, including accessories, minimum 3 days per workweek. Report results in writing.
- B. Remove and replace applications of metal roof panels where tests and inspections indicate that they do not comply with specified requirements.
- C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
- D. Prepare test and inspection reports.

3.9 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 07 41 13.16

SECTION 07 42 13 - METAL WALL PANELS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ALUMINUM ASSOCIATION (AA)

- AA ADM (2020) Aluminum Design Manual
AA ASD1 (2017; Errata 2017) Aluminum Standards and Data

AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

- AAMA 501.1 (2017) Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure
AAMA 800 (2016) Voluntary Specifications and Test Methods for Sealants

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

- AISC 341 (2016) Seismic Provisions for Structural Steel Buildings

AMERICAN IRON AND STEEL INSTITUTE (AISI)

- AISI S100 (2012) North American Specification for the Design of Cold-Formed Steel Structural Members
AISI SG03-3 (2002; Suppl 2001-2004; R 2008)
Cold-Formed Steel Design Manual Set

Metallic-Coated by the Hot-Dip Process

- ASTM A1008/A1008M (2021a) Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable
ASTM B117 (2019) Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM B209 (2014) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B209M (2014) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric)
ASTM C286 (2022) Standard Terminology Relating to Porcelain Enamel and Ceramic-Metal Systems

ASTM C920	(2018) Standard Specification for Elastomeric Joint Sealants
ASTM D522/D522M	(2017) Mandrel Bend Test of Attached Organic Coatings
ASTM D523	(2014; R 2018) Standard Test Method for Specular Gloss
ASTM D610	(2008; R 2019) Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces
ASTM D714	(2002; R 2017) Standard Test Method for Evaluating Degree of Blistering of Paints
ASTM D822	(2013; R 2018) Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings
ASTM D968	(2022) Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D1056	(2020) Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
ASTM D1308	(2002; R 2013) Effect of Household Chemicals on Clear and Pigmented Organic Finishes
ASTM D1654	(2008; R 2016; E 2017) Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
ASTM D1667	(2022) Standard Specification for Flexible Cellular Materials - Poly (Vinyl Chloride) Foam (Closed-Cell)
ASTM D2244	(2021) Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates
ASTM D2247	(2015; R 2020) Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
ASTM D2794	(1993; R 2019) Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D3359	(2017) Standard Test Methods for Rating Adhesion by Tape Test
ASTM D3363	(2005; E 2011; R 2011; E 2012) Film Hardness by Pencil Test
ASTM D4214	(2007; R 2015) Standard Test Method for Evaluating

the Degree of Chalking of Exterior Paint Films

ASTM D4587 (2011; R 2019; E 2019) Standard Practice for Fluorescent UV-Condensation Exposures of Paint and Related Coatings

ASTM D5894 (2016) Standard Practice for Cyclic Salt Fog/UV Exposure of Painted Metal, (Alternating Exposures in a Fog/Dry Cabinet and a UV/Condensation Cabinet)

ASTM E72 (2022) Conducting Strength Tests of Panels for Building Construction

ASTM E84 (2023) Standard Test Method for Surface Burning Characteristics of Building Materials

ASTM E283 (2019) Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

ASTM E331 (2000; R 2023) Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference

ASTM E1592 (2017) Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference

ASTM G152 (2013; R 2021) Standard Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

ASTM G153 (2013; R 2021) Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

METAL BUILDING MANUFACTURERS ASSOCIATION (MBMA)

MBMA MBSM (2018) Metal Building Systems Manual NATIONAL

ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM)

NAAMM AMP 500 (2006) Metal Finishes Manual

PORCELAIN ENAMEL INSTITUTE (PEI)

PEI 1001 (1996) Specification for Architectural Porcelain Enamel (ALS-100)

PEI CG-3 (2005) Color Guide for Architectural Porcelain Enamel

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

SMACNA 1793 (2012) Architectural Sheet Metal Manual, 7th Edition

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC (2013) Leadership in Energy and Environmental
Design(tm) New Construction Rating System

UNDERWRITERS LABORATORIES (UL)

UL Bld Mat Dir (updated continuously online) Building Materials
Directory

1.2 DEFINITIONS

Metal Wall Panel: Metal wall panels, attachment system components and accessories necessary for a complete weather-tight wall system.

DESCRIPTION OF WALL PANEL SYSTEM

Factory color finished metal wall panel system with exposed fastener attachment. Panel profile must be as shown on drawings.

1.2.1 Metal Wall Panel General Performance

Comply with performance requirements, conforming to AISI S100, without failure due to defective manufacture, fabrication, installation, or other defects in construction. Wall panels and accessory components must conform to the following standards:

ASTM A606/A606M

ASTM A755/A755M for metallic coated steel sheet for exterior coil pre-painted applications.

ASTM A924/A924M for metallic coated steel sheet

1.2.2 Structural Performance

Maximum calculated fiber stress must not exceed the allowable value in the AISI or AA manuals; a one third overstress for wind is allowed. Midspan deflection under maximum design loads is limited to L/180. Contract drawings show the design wind loads and the extent and general assembly details of the metal siding. Contractor must provide design for members and connections not shown on the drawings. Siding panels and accessories must be the products of the same manufacturer.

Provide metal wall panel assemblies complying with the load and stress requirements in accordance with ASTM E1592. Wind Load force due to wind action governs the design for panels.

Wall systems and attachments are to resist the wind loads as determined by ASTM E72 and ASCE 7-16 in the geographic area where the construction will take place, in pounds per square foot.

1.2.3 Air Infiltration

Air leakage must conform to the limits through the wall assembly area when tested according to ASTM E283.

1.2.4 Water Penetration Under Static Pressure

No water penetration when tested according to ASTM E331.

1.2.5 Water Penetration Under Dynamic Pressure

No evidence of water leakage when tested according to AAMA 501.1.

1.3 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

- a. Shop Drawings
- b. Product Data
- c. Recycled Content; (LEED NC)

Submit Manufacturer's catalog data for the following items:

- d. Wall Panels ;
 - 1. Factory Color Finish
 - 2. Closure Materials
 - 3. Pressure Sensitive
 - 4. Tape Sealants and
 - 5. Caulking Galvanizing
 - 6. Repair Paint Enamel
 - 7. Repair Paint
 - 8. Accessories

- e. Manufacturer's Instructions

Include detailed application instructions and standard manufacturer drawings altered as required by these specifications.

Installation of Wall panels;

- f. Closeout Submittals Warranty;
 - 1. Maintenance Instructions;
 - 2. 20 year "No Dollar Limit" warranty for labor and material

]1.5 QUALITY ASSURANCE

1.5.1.1 Installation Drawings

Installation shop drawings for wall panels, flashing, accessories, and anchorage systems must indicate completely dimensioned structural frame and erection layouts, openings in the wall, special framing details, and construction details at corners, building intersections and flashing, location and type of mastic and metal filler strips.

1.5.2 Qualification of Manufacturer

Certify that metal wall panel system manufacturer has a minimum of five

(5) years experience in manufacturing metal wall system and accessory products.

1.5.2.1 Manufacturer's Certificates

Also provide the following certifications from the manufacturer: Coil Stock
Fasteners
Galvanizing Repair Paint Enamel Repair
Paint

Submit certification from coil stock manufacturer or supplier that the machinery used will form the provided coil stock without warping, waviness, or rippling that is not a part of the panel profile, and without damage, abrasion or marring of the finish coating.

1.5.3 Certified Qualification of Installation Contractor

The installation contractor must be approved and certified by the metal wall panel manufacturer prior to beginning the installation of the metal wall panel system. Subcontracting by Certified Contractor for the metal wall panel work is not permitted.

1.5.4 Manufacturer's Maintenance Instructions

Provide manufacturer's detailed written instructions including copies of Safety Data Sheets for maintenance and repair materials.

1.6 DELIVERY, HANDLING, AND STORAGE

Deliver and protect package components, sheets, metal wall panels, and other manufactured items to prevent damage or deformation during transportation and handling

Unload, store, and erect metal wall panels in a manner to prevent bending, warping, twisting, and surface damage.

Stack and store metal wall panels horizontally on platforms or pallets, covered with suitable weather-tight and ventilated covering to ensure dryness, with positive slope for drainage of water. Do not store metal wall panels in contact with other materials that might cause staining, denting, or other surface damage.

Retain strippable protective covering on metal wall panel until actual installation.

1.7 PROJECT CONDITIONS

1.7.1 Field Measurements

Verify locations of wall framing and opening dimensions by field measurements before metal wall panel fabrication and indicate measurements on Shop Drawings.

1.7.2 Weather Limitations

Proceed with installation preparation only when existing and forecasted weather conditions permit Work to proceed without water entering into wall system or building.

1.8 WARRANTY

Warranty must conform to the Sample Warranty as reviewed and approved by the owner

1.8.1 20 Year "No Dollar Limit" Warranty for Labor and Material

Furnish manufacturer's no-dollar-limit warranty for the metal wall panel system. The warranty period is to be no less than twenty (20) years from the date of acceptance of the work.

PART 2 PRODUCTS

2.1 FABRICATION

Unless approved otherwise, fabricate and finish metal wall panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes and as necessary to fulfill indicated and specified performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel. Fabricate metal wall panel side laps with factory-installed captive gaskets or separator strips that provide a tight seal and prevent metal-to-metal contact, in a manner that will seal weather-tight and minimize noise from movements within panel assembly.

2.1.1 Sheet Metal Accessories

Fabricate flashing and trim to comply with recommendations in SMACNA 1793 that apply to the design, dimensions, metal, and other characteristics of item indicated:

- a. 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.
- b. End Seams: fabricate nonmoving end seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
- c. Sealed Joints: form non-expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA 1793.
- d. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
- e. Fabricate cleats and attachment devices of size and metal thickness recommended by SMACNA 1793 or by metal wall panel manufacturer for application, but not less than thickness of metal being secured.

2.2 PANEL MATERIALS

2.2.2 Steel Sheet

Roll-form steel wall panels to the specified profile, 26 gauge and depth as indicated. Material must be plumb and true, and within the tolerances listed:

- a. Galvanized Steel Sheet conforming to ASTM A653/A653M and AISI SG03-3.
- b. Aluminum-Zinc Alloy-coated Steel Sheet conforming to ASTM A792/A792M and AISI SG03-3.
- c. Individual panels must be continuous length to cover the entire length of any unbroken wall area with no joints or seams and formed without warping, waviness, or ripples that are not part of the panel profile and free of damage to the finish coating system.
 - a. Provide panels with thermal expansion and contraction consistent with the type of system specified.
 1. Profile and coverage to be a minimum height and width from manufacturer's standard for the indicated wall area.

2. Smooth Surface Texture.

2.2.3 Factory Color Finish

Comply with NAAMM AMP 500 for recommendations for applying and designating finishes. 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.

All panels are to receive a factory-applied Kynar 500/Hylar 5000 finish consisting of a baked-on top-coat with a manufacturer’s recommended prime coat conforming to the following:

2.2.3.1 Metal Preparation

Carefully prepare all metal surface for painting on a continuous process coil coating line by alkali cleaning, hot water rinsing, application of chemical conversion coating, cold water rinsing, sealing with acid rinse, and thorough drying.

2.2.3.2 Prime Coating

Apply a base coat of epoxy paint, specifically formulated to interact with the top-coat, to the prepared surfaces by roll coating to a dry film thickness of 0.20 plus 0.05 mils. Prime coat must be oven cured prior to application of finish coat.

2.2.3.3 Exterior Finish Coating

Roll coat the finish coating over the primer by roll coating to dry film thickness of 0.80 plus 5 mils (3.80 plus 0.50 mils for Vinyl Plastisol) for a total dry film thickness of 1.00 plus 0.10 mils (4.00 plus 0.10 mils for Vinyl Plastisol). Oven-cure finish coat.

2.2.3.4 Interior Finish Coating

Apply a wash-coat on the reverse side over the primer by roll coating to a dry film thickness of 0.30 plus 0.05 mils for a total dry film thickness of 0.50 plus 0.10 mils. Oven-cured the wash coat.

2.2.3.5 Color

Provide exterior finish color as selected by the architect from the manufacturer's standard as specified.

2.2.3.6 Physical Properties

Coating must conform to the industry and manufacturer's standard performance criteria as listed by the following certified test reports:

2.2.3.7

General:	ASTM D5894 and ASTM D4587
Abrasion:	ASTM D968
Adhesion:	ASTM D3359
Chalking:	ASTM D4214
Chemical Pollution:	ASTM D1308

Color Change and Conformity:	ASTM D2244
Creepage:	ASTM D1654
Cyclic Corrosion Test:	ASTM D5894
Flame Spread:	ASTM E84
Flexibility:	ASTM D522/D522M
Formability:	ASTM D522/D522M
Gloss at 60 and 85 degrees:	ASTM D523
Humidity:	ASTM D2247 and ASTM D714
Oxidation:	ASTM D610
Pencil Hardness:	ASTM D3363
Reverse Impact:	ASTM D2794
Salt Spray:	ASTM B117
Weatherometer:	ASTM G152, ASTM G153 and ASTM D822

2.3 MISCELLANEOUS METAL FRAMING

Cold-formed metallic-coated steel sheet conforming to ASTM A653/A653M and specified in Section 05 40 00 COLD-FORMED METAL FRAMING unless otherwise indicated.

2.3.1 Fasteners for Miscellaneous Metal Framing

Type, material, corrosion resistance, size and sufficient length to penetrate the supporting member a minimum of 2.54 cm 1 inch with other properties required to fasten miscellaneous metal framing members to supporting members and substrates in accordance with the wall panel manufacturer's and ASCE 7-16 requirements.

2.4 FASTENERS

2.4.1 General

2.4.1.1 Exposed Fasteners

Provide corrosion resistant fasteners for wall panels, made of coated steel, 300 - series corrosion resisting stainless steel, or nylon capped steel compatible with the sheet panel or flashing and of a type and size recommended by the manufacturer to meet the performance requirements and design loads.

Fasteners for accessories must be the manufacturer's standard. Provide an integral metal washer matching the color of attached material with compressible sealing EPDM gasket approximately 0.24 cm 3/32 inch thick.

2.4.1.2 Hidden Fasteners

Provide corrosion resistant fasteners recommended by the manufacturer to meet the performance requirements and design loads.

2.5 ACCESSORIES

2.5.1 General

All accessories must be compatible with the metal wall panels. Sheet metal flashing, trim, metal closure strips, caps and similar metal accessories must not be less than the minimum thickness specified for the wall panels. Exposed metal accessories/finishes to match the panels furnished, except as otherwise indicated. Molded foam rib, ridge and other closure strips must be non-absorbent closed-cell or solid-cell synthetic rubber or pre-molded neoprene to match configuration of the panels.

2.5.2 Rubber Closure Strips

Provide closed-cell, expanded cellular rubber conforming to ASTM D1056 and ASTM D1667; extruded or molded to the configuration of the specified wall panel and in lengths supplied by the wall panel manufacturer.

2.5.3 Metal Closure Strips

Provide factory fabricated steel closure strips to be the same gauge thickness, color, finish and profile of the specified wall panel.

2.5.4 Joint Sealants

2.5.4.1 Sealants and Caulking

Provide approved gun type sealants for use in hand- or air-pressure caulking guns at temperatures above 4 degrees C 40 degrees F (or frost-free application at temperatures above minus 12 degrees C 10 degrees F with minimum solid content of 85 percent of the total volume. Sealants must dry with a tough, durable surface skin which permit remaining soft and pliable underneath, providing a weather-tight joint. No migratory staining is permitted on painted or unpainted metal, stone, glass, vinyl, or wood.

Prime all joints receiving sealants with a compatible one-component or two-component primer as recommended by the wall panel manufacturer.

2.5.4.2 Field-Applied

Sealant for field-applied caulking must be an approved gun grade, non-sag one component polysulfide or two-component polyurethane with an initial maximum Shore A durometer hardness of 25, and conforming to ASTM C920, Type II. Color to match panel colors.

2.5.4.3 Pressure Sensitive Tape

Provide pressure sensitive tape sealant, 100 percent solid with a release paper backing; permanently elastic, non-sagging, non-toxic and non-staining as approved by the wall panel manufacturer.

2.6 SHEET METAL FLASHING AND TRIM

2.6.1 Fabrication

Shop fabricate sheet metal flashing and trim where practicable to comply with recommendations in SMACNA 1793 that apply to design, dimensions, metal, and other characteristics of item indicated. Obtain field measurements for accurate fit before shop fabrication.

Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.

2.7 REPAIR OF FINISH PROTECTION

Repair paint for color finish enameled wall panel must be compatible paint of the same formula and color as the specified finish furnished by the wall panel manufacturer. Provide repair paint matching the specified wall panels.

PART 3 EXECUTION

3.1 EXAMINATION

Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal wall panel supports, and other conditions affecting performance of the Work.

Examine primary and secondary wall framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal wall panel manufacturer, UL, ASTM, ASCE 7-16 and as required for the geographical area where construction will take place.

Examine solid wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.

Examine roughing-in for components and systems penetrating metal wall panels to verify actual locations of penetrations relative to seam locations of metal wall panels before metal wall panel installation.

Submit to the architect a written report, endorsed by Installer, listing conditions detrimental to performance of the Work. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.

Miscellaneous framing installation, including sub-purlins, girts, angles, furring, and other miscellaneous wall panel support members and anchorage must be according to metal wall panel manufacturer's written instructions.

3.3 WALL PANEL INSTALLATION

Provide full length metal wall panels, from sill to eave as indicated, unless otherwise indicated or restricted by shipping limitations. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement in accordance with MBMA MBSM.

Erect wall panel system in accordance with the approved erection drawings, the printed instructions and safety precautions of the manufacturer.

Sheets are not to be subjected to overloading, abuse, or undue impact. Bent, chipped, or defective sheets shall not be applied.

Sheets must be erected true and plumb and in exact alignment with the horizontal and vertical edges of the building, securely anchored, and with the indicated eave, and sill.

Work is to allow for thermal movement of the wall panel, movement of the building structure, and to provide permanent freedom from noise due to wind pressure.

Field cutting metal wall panels by torch is not permitted. 3.3.1 Steel Wall

Panels

Use stainless-steel fasteners for exterior surfaces and galvanized steel fasteners for interior surfaces.

3.3.3 Anchor Clips

Anchor metal wall panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.

3.3.4 Metal Protection

Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal wall panel manufacturer.

3.3.5 Joint Sealers

Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal wall panel manufacturer.

3.4 FASTENER INSTALLATION

Anchor metal wall panels and other components of the Work securely in place, using manufacturer's

approved fasteners according to manufacturers' written instructions.

3.5 FLASHING, TRIM AND CLOSURE INSTALLATION

3.5.1 General Requirements

Comply with performance requirements, manufacturer's written installation instructions, and SMACNA 1793. Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams to form permanently watertight and weather resistant. Install sheet metal work is to form weather-tight construction without waves, warps, buckles, fastening stresses or distortion, and allow for expansion and contraction. Cutting, fitting, drilling, and other operations in connection with sheet metal required to accommodate the work of other trades is to be performed by sheet metal mechanics.

3.5.2 Metal Flashing

Install exposed metal flashing at building corners, sills and eaves, junctions between metal siding and walling. Exposed metal flashing must be the same material, color, and finish as the specified metal wall panel.

Fasten flashing at a minimum of 8 inches on center, except where flashing is held in place by the same screws that secure covering sheets.

Flashing is to be furnished in at least 8 foot lengths. Exposed flashing is to have 2.54 cm 1 inch locked and blind-soldered end joints, and expansion joints at intervals of not more than 16 feet.

Exposed flashing and flashing subject to rain penetration to be bedded in the specified joint sealant.

Isolate flashing which is in contact with dissimilar metals by means of the specified asphalt mastic material to prevent electrolytic deterioration.

Form drips to the profile indicated, with the edge folded back 1.27 cm 1/2 inch to form a reinforced drip edge.

3.5.3 Closures

Install metal closure strips at open ends of corrugated or ribbed pattern walls, and at intersection of wall and wall unless open ends are concealed with formed eave flashing; and in other required areas.

Install mastic closure strips at intersection of the wall with metal walling; top and bottom of metal siding; heads of wall openings; and in other required locations.

3.6 WORKMANSHIP

Make lines, arises, and angles sharp and true. Free exposed surfaces from visible wave, warp, buckle, and tool marks. Fold back exposed edges neatly to form a 1.27 cm 1/2 inch hem on the concealed side. Make sheet metal exposed to the weather watertight with provisions for expansion and contraction.

Make surfaces to receive sheet metal plumb and true, clean, even, smooth, dry, and free of defects and projections which might affect the application. For installation of items not shown in detail or not covered by specifications conform to the applicable requirements of SMACNA 1793.

Provide sheet metal flashing in the angles formed where roof decks abut walls, curbs, ventilators, pipes, or other vertical surfaces and wherever indicated and necessary to make the work watertight.

3.7 ACCEPTANCE PROVISIONS

3.7.1 Erection Tolerances

Erect metal wall panels straight and true with plumb vertical lines correctly lapped and secured in accordance with the manufacturer's written instructions.

3.7.2 Leakage Tests

Finished application of metal wall panels are to be subject to inspection and test for leakage by request of the Architect/Engineer. Conduct inspection and tests at no cost to the Government.

Inspection and testing is to be made promptly after erection to permit correction of defects and the removal and replacement of defective materials.

3.7.3 Repairs to Finish

Scratches, abrasions, and minor surface defects of finish may be repaired with the specified repair materials. Finished repaired surfaces must be uniform and free from variations of color and surface texture.

Repaired metal surfaces that are not acceptable to the project requirements and/or architect are to be immediately removed and replaced with new material.

3.7.4 Paint-Finish Metal Siding

Paint-finish metal siding will be tested for color stability by the architect during the manufacturer's specified guarantee period.

Panels that indicate color changes, fading, or surface degradation, determined by visual examination, must be removed and replaced with new panels at no expense to the Government.

New panels will be subject to the specified tests for an additional year from the date of their installation.

3.8 FIELD QUALITY CONTROL

3.8.1 Construction Monitoring

Make visual inspections as necessary to ensure compliance with specified requirements. Additionally, verify the following:

- a. Materials comply with the specified requirements.
- b. All materials are properly stored, handled and protected from damage. Damaged materials are removed from the site.
- c. Framing and substrates are in acceptable condition, in compliance with specification, prior to application of wall panels.
- d. Panels are installed without buckles, ripples, or waves and in uniform alignment and modulus.

- e. Side laps are formed, sealed, fastened or seam locked as required.
- f. The proper number, type, and spacing of attachment clips and fasteners are installed.
- g. Installer adheres to specified and detailed application parameters.
- h. Associated flashing and sheet metal are installed in a timely manner in accord with the specified requirements.

3.9 CLEAN-UP AND DISPOSAL

Clean all exposed sheet metal work at completion of installation. Remove metal shavings, filings, nails, bolts, and wires from work area. Remove grease and oil films, excess sealants, handling marks, contamination from steel wool, fittings and drilling debris and scrub the work clean. Exposed metal surfaces must be free of dents, creases, waves, scratch marks, solder or weld marks, and damage to the finish coating.

Collect and place scrap/waste materials in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site; transport demolished materials from government property and legally dispose of them.

-- END OF SECTION --

SECTION 07 46 46.10 - FIBER-CEMENT SIDING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fiber cement lap siding, panels, shingle, trim, fascia, moulding, and accessories.
- B. Factory-finished fiber cement lap siding, panels, shingle, trim, fascia, moulding, and accessories.

1.2 RELATED SECTIONS

- A. Section 05 40 00 - Cold-Formed Metal Framing.
- B. Section 06 10 00 - Rough Carpentry.
- C. Section 07 21 19 - Foamed-In-Place Insulation.

1.3 REFERENCES

- A. ASTM D3359 - Standard Test Method for Measuring Adhesion by Tape Test, Tool and Tape.
- B. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: Provide detailed drawings of atypical non-standard applications of cementitious siding materials which are outside the scope of the standard details and specifications provided by the manufacturer.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum of 2 years experience with installation of similar products.
- B. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - 3. Remodel mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

- B. Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.
- C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

- A. Product Warranty: Limited, non-pro-rated product warranty.
 - 1. 30 years.
- B. Finish Warranty: Limited product warranty against manufacturing finish defects.
 - 1. When used for its intended purpose, properly installed and maintained according to published installation instructions, for a period of 15 years from the date of purchase: will not peel; will not crack; and will not chip. Finish warranty includes the coverage for labor and material.
- C. Workmanship Warranty: Application limited warranty for 2 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
- B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
- C. Requests for approval of equal substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 TEXTURED PANELS AND TRIM

- A. Hardie Architectural Panels as manufactured by James Hardie Building Products, Inc. A non-combustible fiber-cement panel.
 - 1. Product Composition: Grade II, Type A, fiber-cement sheets as defined by ASTM C1186. manufactured by the Hatschek process and cured by high pressure steam autoclaving.
 - 2. Florida State Product Approval FL13223.
 - 3. Florida State Product Approval FL 32103.
 - 4. Intertek Product Listing.
 - 5. Code Compliance:
 - a. International Building Code (IBC):
 - 1) Section 1404.10: 2009, 2012 and 2015.
 - 2) Section 1403.10: 2018 and 2021.
 - b. International Residential Code (IRC):
 - 1) Table R703.3(1): 2009, 2012, 2015, 2018, and 2021.
 - 2) Section R703.10.1 as ASTM C 1186 Grade II, Type A Fiber

- Cement: 2009, 2012, 2015, 2018 and 2021.
- c. Florida Building Code (FBC):
 - 1) Section 1404.10: 2017 and 2020.
 - 2) Section 1405.16 as ASTM C 1186 Grade II, Type A Fiber Cement.
 - d. Wind Design:
 - 1) Manufacturer's readily available design load and exposure category tables are derived from testing in accordance with ASTM E 330.
 - 2) Wind speed design coefficient assumptions per Analytical Method in ASCE 7.
 - 3) Wood Framing Specific Gravity: 0.42 or greater unless otherwise stated.
 - 4) Wood Structural Sheathing Panel Specific Gravity of 0.50 or higher unless otherwise stated.
6. Fire Characteristics:
- a. Tested in Accordance with ASTM E136: Classified as non-combustible.
 - b. May be used in ASTM E119 fire resistance rated assemblies as listed by Warnock Hersey.
 - c. Class A Material: Per FBC 2017 and 2020, and 2018 IBC Section 803.1.1 Surface Burning Characteristics when tested in accordance with ASTM E84:
 - 1) Flame Spread Index : 0. Smoke Developed Index: 0.
7. Type (WxL): Hardie Architectural Panel - Fine Sand 4 by 8 feet (1219 by 2438 mm).
8. Type (WxL): Hardie Architectural Panel - Fine Sand 4 by 10 feet (1219 by 3048 mm).
9. Type (WxL): Hardie Architectural Panel - Fine Sand 4 by 12 feet (1219 by 3658 mm).
10. Type (WxL): Hardie Architectural Panel - Mounded Sand 4 by 8 feet (1219 by 2438 mm).
11. Type (WxL): Hardie Architectural Panel - Mounded Sand 4 by 10 feet (1219 by 3048 mm).
12. Type (WxL): Hardie Architectural Panel - Mounded Sand 4 by 12 feet (1219 by 3658 mm).
13. Type (WxL): Hardie Architectural Panel - Fine Sand-Grooved 4 by 8 feet (1219 by 2438 mm).
14. Type (WxL): Hardie Architectural Panel - Fine Sand-Grooved 4 by 10 feet (1219 by 3048 mm).
15. Type (WxL): Hardie Architectural Panel - Fine Sand-Grooved 4 by 12 feet (1219 by 3658 mm).
- a. Thickness: 0.3125 inches (8 mm).
 - b. Length: 96 inches (2438 mm).
 - c. Length: 120 inches (3048 mm).
 - d. Length: 144 inches (3658 mm).
 - e. Width: 48 inches (1219 mm).
 - f. Vertical Joint: Shiplap.
16. Physical Properties:
- a. Test Method ASTM C1185: Passed.
 - 1) Dimensional Tolerances:
 - a) Length: Plus or minus 0.5 percent or plus or minus 1/4 inch (6 mm).
 - b) Width: Plus or minus 0.5 percent or plus or minus 1/4 inch (6 mm).
 - c) Thickness: Plus or minus 0.04 inch (1 mm).

- d) Squareness: Less than 1/32 inches per ft (2.6 mm per m) of length.
 - e) Edge Straightness: Less than 1/32 inches per ft (2.6 mm per m) of length.
 - 2) Density: Less than 83 pounds per sq ft (4 kPa).
 - 3) Water Tightness: No drop formation; Pass.
 - 4) Flexural strength:
 - a) Wet Conditioned, psi: Greater than 1015 psi (7 MPa); Pass.
 - b) Equilibrium Conditioned, psi: Greater than 1450 psi (10 MPa); Pass.
 - 5) Warm Water Resistance, Observations: No structural alteration; Pass
 - 6) Heat and Rain Resistance: No structural alteration; Pass.
 - 7) Freeze and Thaw Resistance:
 - a) Physical Observations Mass: No structural alteration; Pass
 - b) Loss Percentage: Less than or equal to 3.0 percent; Pass.
 - c) Freeze/Thaw, Percent Strength Retention: Greater than or equal to 80 percent; Pass.
 - b. Fire Characteristics:
 - 1) ASTM E84: Surface Burning Characteristics.
 - a) Flame Spread Index (FSI) Smoke: 0.
 - b) Developed Index (SDI): 0.
 - c) Fuel Contributed: 0.
 - d) International Building Code: A.
 - 2) ASTM E136: Non-combustibility: Pass.
17. Trim Accessories:
- a. J Trim: Aluminum extrusion to be used as a trim at abutments; soffits, masonry, windows, etc.
 - b. Low-Profile Inside Corner Trim: Aluminum extrusion to be used for inside corners.
 - c. Inside Corner Trim: Aluminum extrusion to be used for inside corners.
 - d. Low-Profile Outside Corner Trim: Aluminum extrusion to be used for outside corners.
 - e. Low Profile 45 degrees Inside Corner Trim: Aluminum extrusion to be used for bay windows.
 - f. Low Profile 45 degrees Outside Corner Trim: Aluminum extrusion to be used for bay windows.
 - g. Vertical T Trim: Aluminum extrusion to be used along vertical butt joints. For horizontal panel orientations only.
 - h. Vertical H Trim: Aluminum extrusion to be used along vertical butt joints. For horizontal panel orientations only.
 - i. Horizontal Angled T Flashing Trim: Aluminum extrusion to be used along horizontal control joints.
 - j. Horizontal Z Flashing Trim: Aluminum extrusion to be used along horizontal control joints.
 - k. Base Trim: Aluminum extrusion to be used as a base edge solution.
 - l. Base Outside Corner Trim: To be used as an outside corner connection for Base trim.
 - m. Base Inside Corner Trim: To be used as an inside corner connection for Base trim.
 - n. Base Jointer: To be used to connect Base trims.
 - o. HardieTrim Boards: Fiber cement trim for corners and windows. Can be mounted horizontally or vertically.

2.3 FASTENERS

A. Wood Framing Fasteners:

1. Wood Framing: 4d common corrosion resistant nails.
2. Wood Framing: 6d common corrosion resistant nails.
3. Wood Framing: 8d box ring common corrosion resistant nails.
4. Wood Framing: 0.089 inch (2.2 mm) shank by 0.221 inch (5.6 mm) head by 2 inches (51 mm) corrosion resistant siding nails.
5. Wood Framing: 0.093 inch (2.4 mm) shank by 0.222 inch (5.6 mm) head by 2 inches (51 mm) corrosion resistant siding nails.
6. Wood Framing: 0.093 inch (2.4 mm) shank by 0.222 inch (5.6 mm) head by 2-1/2 inches (64 mm) corrosion resistant siding nails.
7. Wood Framing: 0.091 inch (2.3 mm) shank by 0.221 inch (5.6 mm) head by 1-1/2 inches (38 mm) corrosion resistant siding nails.
8. Wood Framing: 0.091 inch (2.3 mm) shank by 0.225 inch (5.7 mm) head by 1-1/2 inches (38 mm) corrosion resistant siding nails.
9. Wood Framing: 0.121 inch (3 mm) shank by 0.371 inch (9.4 mm) head by 1-1/4 inches (32 mm) corrosion resistant roofing nails.
10. Wood Framing: No. 11 gauge 1-1/4 inches (32 mm) corrosion resistant roofing nails.
11. Wood Framing: No. 11 gauge 1-1/2 inches (38 mm) corrosion resistant roofing nails.
12. Wood Framing: No. 11 gauge 1-3/4 inches (44 mm) corrosion resistant roofing nails.
13. Wood Framing: 16 gauge 1-1/2 inches (38 mm) stainless finish nails

B. Metal Framing:

1. Metal Framing: 1-1/4 inches (32 mm) No. 8-18 by 0.375 inch (9.5 mm) head self-drilling, corrosion resistant S-12 ribbed buglehead screws.
2. Metal Framing: 1-5/8 inches (41 mm) No. 8-18 by 0.323 inch (8.2 mm) head self-drilling, corrosion resistant S-12 ribbed buglehead screws.
3. Metal Framing: 1 inch (25 mm) No. 8-18 by 0.323 inch (8.2 mm) head self-drilling, corrosion resistant ribbed buglehead screws.
4. Metal Framing: 1 inch (25 mm) No. 8-18 by 0.311 inch (7.9 mm) head self-drilling, corrosion resistant S-12 ribbed buglehead screws.
5. Metal Framing: 1.5 inch (38 mm) [AGS-100] .100 inches by 25 inches (2540 mm by 635 mm) ET and F Pin or equivalent pneumatic fastener.

C. Masonry Walls:

1. Masonry Walls: Aerico Stud Nail, ET&F ASM No.-144-125, 0.14 inch (3.6 mm) shank by 0.30 inch (7.6 mm) head by 2 inches (51 mm) long corrosion resistant nails.

2.4 FINISH

A. Factory Primer: Provide factory applied universal primer.

1. Primer: Factory primed by James Hardie.
2. Topcoat: Refer to Section 09 90 00 - Painting and Coating and Exterior Finish Schedule.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If framing preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Nominal 2 inch by 4 inch (51 mm by 102 mm) wood framing selected for minimal shrinkage and complying with local building codes, including the use of water-resistive barriers or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.
 - 1. Install water-resistive barriers and claddings to dry surfaces.
 - 2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
 - 3. Protect siding from other trades.
- D. Minimum 20 gauge 3-5/8 inch (92 mm) C-Stud 16 inches maximum on center or 16 gauge 3-5/8 inches (92 mm) C-Stud 24 inches (610 mm) maximum on center metal framing complying with local building codes, including the use of water-resistive barriers and/or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.
 - 1. Install water-resistive barriers and claddings to dry surfaces.
 - 2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
 - 3. Protect siding from other trades.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Install a water-resistive barrier is required in accordance with local building code requirements.
- D. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements.
- E. Install Engineered for Climate HardieWrap weather barrier or approved equal in accordance with local building code requirements.
- F. Use HardieWrap Seam Tape or approved equal and joint and laps.
- G. Install and HardieWrap flashing, HardieWrap Flex Flashing or approved equal.

3.3 INSTALLATION - HARDIE ARCHITECTURAL PANELS

- A. Install materials in strict accordance with manufacturer's installation instructions.
- B. Install over braced wood. See General Fastening Requirements. Irregularities in framing and sheathing can mirror through the finished application. Correct irregularities before installing siding.
- C. A water-resistive barrier (WRB) is required in accordance with local building code requirements. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements. James Hardie will assume no responsibility for water infiltration.

- D. When installing horizontally, a WRB with min. 90 percent drainage efficiency shall be used.
- E. Adjacent finished grade must slope away from the building in accordance with local building codes - typically a minimum of 6 inches (152 mm). in the first 10 ft (3.048 mm).
- F. Do not use Hardie Architectural Panels in Fascia or Trim applications.
- G. Do not install that product remains in contact with standing water.
- H. Installed on flat vertical wall applications only.
- I. For larger projects where the span of the wall is significant in length, the designer and/or architect should take into consideration the coefficient of thermal expansion and moisture movement of the product in their design. These values can be found in the Technical Bulletin "Expansion Characteristics of James Hardie Siding Products" at www.jameshardie.com.
- J. James Hardie Building Products provides installation /wind load information for buildings with a maximum mean roof height of 85 feet (25.9 m). For information on installations above 60 feet (18.288 m), please contact JH technical support.
- K. Minimum standard panel design size is 12 x 16 inches (305 x 406 mm). Panels may be notched and cut to size to fit between windows, doors, corners, etc.

3.4 FINISHING

- A. Finish unprimed siding with a minimum one coat high quality, alkali resistant primer and one coat of either, 100 percent acrylic or latex or oil based, exterior grade topcoats or two coats high quality alkali resistant 100 percent acrylic or latex, exterior grade topcoat within 90 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.
- B. Finish factory primed siding with a minimum of one coat of high-quality 100 percent acrylic or latex or oil based exterior grade paint within 180 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.

3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 07 46 00

SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Fabricated sheet metal items, including flashings, counter-flashings, gutters, and downspouts.
 - 1. Manufactured through-wall flashing [**with counterflashing**].
 - 2. Manufactured reglets [**with counterflashing**].
 - 3. Formed roof-drainage sheet metal fabrications.
 - 4. Formed wall sheet metal fabrications.
 - 5. Formed equipment support flashing.
 - 6. Formed overhead-piping safety pans.
 - 7. Sealants for joints within sheet metal fabrications.
 - 8. Sheet metal splash pans.

1.3 RELATED REQUIREMENTS

- A. Section 061000 - Rough Carpentry: Wood nailers for sheet metal work.
- B. Section 074113 – Standing Seam Metal Roof Panels: Factory-formed and field assembled, standing-seam metal roof panels and roof insulation.
- C. Section 079200 - Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.

1.4 REFERENCE STANDARDS

- A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.
- B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- C. ASTM B32 - Standard Specification for Solder Metal; 2008 (Reapproved 2014).
- D. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- E. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.

- F. ASTM B749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products; 2014.
- G. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.
- H. ASTM D2178/D2178M - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing; 2013a.
- I. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012).
- J. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2012.

1.5 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.

1.6 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

1.7 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: For each type of product.
- C. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
- D. Shop Drawings for sheet metal flashing and trim: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
 - 1. Include:
 - a. plans, elevations, sections, and attachment details.
 - b. fabrication and installation layouts, expansion-joint locations, and keyed details; distinguish between shop- and field-assembled work.
 - c. identification of material, thickness, weight, and finish for each item and location in Project.
 - d. details for forming, including profiles, shapes, seams, and dimensions.

- e. details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
- f. details of termination points and assemblies.
- g. details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
- h. details of roof-penetration flashing.
- i. details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
- j. details of special conditions.
- k. details of connections to adjoining work
- l. samples for Verification: For each type of exposed finish.

1.8 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.
- B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 5 years of documented experience.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- C. 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.

1.10 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.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall 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 shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with [NRCA's "The NRCA Roofing Manual"] [and] [SMACNA's "Architectural Sheet Metal Manual"] requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. SPRI Wind Design Standard: Manufacture and install [copings] [roof edge flashings] tested according to SPRI ES-1 and capable of resisting the design pressure [**as indicated in the drawings**].
- D. 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.

2.2 SHEET MATERIALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Metallic-Coated Steel Sheet:
 - 1. Provide [zinc-coated (galvanized) steel sheet according to ASTM A 653/A 653M with kynar finish or equal to match roof panels.

2.3 ACCESSORIES

- A. Fasteners: Same material and finish as flashing metal, with soft neoprene washers.
- B. Underlayment: ASTM D2178, glass fiber roofing felt.
- C. Primer: Zinc chromate type.
- D. Protective Backing Paint: Zinc molybdate alkyd.
- E. Sealant to be Concealed in Completed Work: Non-curing butyl sealant.
- F. Sealant to be Exposed in Completed Work: ASTM C920; elastomeric sealant, 100 percent silicone with minimum movement capability of plus/minus 25 percent and recommended by manufacturer for substrates to be sealed; clear.
- G. Plastic Cement: ASTM D4586, Type I.
- H. Reglets: Surface mounted type, galvanized steel; face and ends covered with plastic tape.
- I. Solder: ASTM B32; Sn50 (50/50) type.

2.4 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest possible lengths.
- C. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- D. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- E. Fabricate corners from one piece with minimum 18-inch-long legs; seam for rigidity, seal with sealant.
- F. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake edges.
- G. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

2.5 GUTTER AND DOWNSPOUT FABRICATION

- A. Gutters: SMACNA (ASMM), Rectangular profile.
- B. Downspouts: Square profile.
- C. Gutters and Downspouts: Size for rainfall intensity determined by a storm occurrence of 1 in 10 years in accordance with SMACNA (ASMM).
- D. Accessories: Profiled to suit gutters and downspouts.
 - 1. Anchorage Devices: In accordance with SMACNA requirements.
 - 2. Gutter Supports: Brackets.
 - 3. Downspout Supports: Brackets.
 - 4. Complete with mitered elbows. Furnish with metal hangers from [**same material as gutters, downspouts and anchors**].
- E. Splash Pads: Precast concrete type, of size and profiles indicated; minimum 3000 psi at 28 days, with minimum 5 percent air entrainment, where indicated on Construction Documents.
- F. Seal metal joints.

PART 3 - EXECUTION

3.1 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.
- B. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- C. Verify roofing termination and base flashings are in place, sealed, and secure.
- D. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

3.2 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.3 INSTALLATION

- 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. Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches; or
- C. Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller. Cover underlayment within 14 days.
- D. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, [**solder**], protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
- E. Insert flashings into reglets to form tight fit. Secure in place with lead wedges. Pack remaining spaces with lead wool. Seal flashings into reglets with sealant.
- F. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.

1. 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]**.
 2. High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - a. Fasteners for **Zinc-Coated (Galvanized)** Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.
- G. Apply plastic cement compound between metal flashings and felt flashings.
- H. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- I. Solder metal joints for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.
 1. For Zinc-Coated (Galvanized) Steel: ASTM B 32, [Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead] [with maximum lead content of 0.2 percent].
- J. Use pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
- K. Apply a Bituminous Coating consisting of a Cold-applied asphalt emulsion according to ASTM D 1187.
- L. Use an Asphalt Roofing Cement that complies with ASTM D 4586, is asbestos free, and of consistency required for application.
- M. Anchor roof edge flashing to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered width centers – width of spacing to be calculated based on Wind Zone.
- N. Anchor copings to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.
- O. Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints minimum of 4 inches.
- P. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with [butyl] sealant and clamp flashing to pipes that penetrate roof.
- Q. Secure gutters and downspouts in place using concealed fasteners. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Fasten gutter spacers to front and back of gutter.
- R. Slope gutters to downspouts 1/4 inch per 10 feet, minimum.
- S. Secure with spikes and ferrules of the same material as gutter; with spike with ferrule matching internal gutter width.
- T. Join downspout sections with 1-1/2-inch (38-mm) telescoping joints.

- U. Provide downspout hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches o.c.
- V. Provide elbows at base of downspout to direct water away from building if downspouts do not connect to underground drainage system.
- W. Set splash pads under downspouts. Set in place with a section of roof membrane when downspout empties onto a roof.
- X. Continuously support parapet scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.
- Y. Install expansion-joint covers at locations and of configuration indicated. Lap joints minimum of 4 inches in direction of water flow.

3.1 ERECTION 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.

3.2 CLEANING AND PROTECTION

- A. Clean off excess sealants.
- B. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.
- C. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

3.3 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements, for field inspection requirements.
- B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION 07 62 00

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Urethane joint sealants.
3. Latex joint sealants.

B. Related Requirements:

1. Section 088000 "Glazing" for glazing sealants.
2. Section 092900 "Gypsum Board" for sealing perimeter joints.
3. Section 093000 "Tiling" for sealing tile joints.

1.3 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.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
- C. Product Test Reports: For each kind of joint sealant, for tests performed by manufacturer and witnessed by a qualified testing agency.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

1.6 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.

1.7 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: Five years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish 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. Correct defective work within a five-year period after Date of Substantial Completion.
 - 2. Include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.
- 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

2.1 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. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- C. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- D. Colors of Exposed Joint Sealants As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

- A. Silicone, S, NS, 50, T, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Uses T and NT.

2.3 NONSTAINING SILICONE JOINT SEALANTS

- A. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.
 - 1. Non-Sag Joint Sealant.
 - 2. Not expected to withstand continuous water immersion or traffic.
 - 3. Movement Capability: Plus and minus 50 percent, minimum.
 - 4. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
 - 5. Color: Match adjacent finished surfaces.
 - 6. Manufacturers:
 - a. Dow Corning Corporation; 790 Silicone Building Sealant: www.dowcorning.com/construction.
 - b. Pecora Corporation; 890NST Ultra Low Modulus Architectural Silicone Sealant Class 100: www.pecora.com.
 - c. Substitutions: See Section 016000 - Product Requirements.
- B. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, 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.
- C. Silicone, Nonstaining, S, NS, 100/50, T, NT: Nonstaining, single-component, nonsag, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Uses T and NT.

2.4 URETHANE JOINT SEALANTS

- A. Single or Multicomponent not expected to withstand continuous water immersion.

1. Color: Match adjacent finished surfaces.
2. Manufacturers:
 - a. Pecora Corporation; DynaTrol I-XL General Purpose One Part Polyurethane Sealant: www.pecora.com.
 - b. Sika Corporation; Sikaflex-2c NS: www.usa-sika.com.
 - c. Substitutions: See Section 016000 - Product Requirements.

- B. Urethane, M, NS, 25, T, NT: Multicomponent, nonsag, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type M, Grade NS, Class 25, Uses T and NT.

2.5 MILDEW-RESISTANT JOINT SEALANTS

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.

1. Non-Sag Joint Sealant.
2. Color: White.
3. Manufacturers:
 - a. Pecora Corporation; 898NST Sanitary Silicone Sealant - Class 50: www.pecora.com.
 - b. Sika Corporation; Sikasil GP: www.usa-sika.com.
 - c. Substitutions: See Section 016000 - Product Requirements.

- 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.

2.6 BUTYL JOINT SEALANTS

- A. Butyl-Rubber-Based Joint Sealants: ASTM C 1311.

2.7 EPOXY JOINT SEALANTS

- A. Semi-Rigid Self-Leveling Epoxy Joint Filler: Epoxy or epoxy/polyurethane copolymer; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.

- B. Composition: Multicomponent, 100 percent solids by weight.

- C. Hardness: Minimum of 85 (Shore A) or 35 (Shore D), when tested in accordance with ASTM D2240 after 7 days.

- D. Joint Width, Minimum: 1/8 inch.

- E. Products:

1. Dayton Superior Corporation; Pro-Poxy P606: www.daytonsuperior.com.
2. Nox-Crete; DynaFlex 502: www.nox-crete.com
3. W.R. Meadows, Inc; Rezi-Weld Flex: www.wrmeadows.com.
4. Substitutions: See Section 016000 - Product Requirements.

2.8 LATEX JOINT SEALANTS

- A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, Grade NF, ASTM C 834.
 - 1. Type OP for opaque sealants containing color or extended pigments and Type C for clear or translucent sealants.
 - 2. Single component, non-staining, non-bleeding, non-sagging, not intended for exterior use.
 - 3. Color: Standard colors matching finished surfaces.
 - 4. Manufacturers:
 - a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant: www.pecora.com.
 - b. Sherwin-Williams Company; 950A Siliconized Acrylic Latex Caulk: www.sherwin-williams.com.
 - c. Substitutions: See Section 016000 - Product Requirements.

2.9 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, Type C (closed-cell material with a surface skin), as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 - 1. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
- 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.

2.10 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

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
 - 1. Verify that backing materials are compatible with sealants.
 - 2. Verify that backer rods are of the correct size.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions 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. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - d. Exterior insulation and finish systems.
 - 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.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
- D. 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.
- E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- F. 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.
- G. 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.

3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 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.

3.6 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Construction joints in cast-in-place concrete.
 - b. Joints between plant-precast architectural concrete units.
 - c. Joints in exterior insulation and finish systems.
 - d. Joints between metal panels.
 - e. Joints between different materials listed above.
 - f. Perimeter joints between materials listed above and frames of doors, windows and louvers.
 - g. Control and expansion joints in ceilings and other overhead surfaces.
 - h. Other joints as indicated on Drawings.
 2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
1. Joint Locations:
 - a. Isolation joints in cast-in-place concrete slabs.
 - b. Control and expansion joints in tile flooring.
 - c. 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. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Tile control and expansion joints.
 - c. Vertical joints on exposed surfaces of unit masonry, concrete, walls and partitions.
 - d. Joints on underside of plant-precast structural concrete beams and planks.
 - e. Other joints as indicated on Drawings.
 2. Joint Sealant: Urethane, S, NS, 25, NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- D. Joint-Sealant Application: 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. Joint-Sealant Application: 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. Joint-Sealant Application: Concealed mastics.
 - 1. Joint Locations:
 - a. Aluminum thresholds.
 - b. Sill plates.
 - c. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Butyl-rubber based.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 07 92 00

DIVISION 08 OPENINGS

SECTION 08 17 43 - COMPOSITE FIBERGLASS DOOR

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. AF-200 Smooth Composite Fiberglass Door with PP Polypropylene Honeycomb Core.
- B. AF-200 Smooth Composite Fiberglass Door with Expanded Polystyrene Core.
- C. AF-200 Smooth Composite Fiberglass Door with PP Polypropylene Honeycomb Core Installed in AF-150 Pultruded Fiberglass Framing.
- D. AF-200 Smooth Composite Fiberglass Door with PP Polypropylene Honeycomb Core Installed in AF-250 Pultruded Fiberglass Framing.
- E. AF-200 Smooth Composite Fiberglass Door with Expanded Polystyrene Core installed in AF-150 Pultruded Fiberglass Framing.
- F. AF-200 Smooth Composite Fiberglass Door with Expanded Polystyrene Core installed in AF-250 Pultruded Fiberglass Framing.

1.02 RELATED SECTIONS

- A. Section 08 01 17 – Operation and Maintenance of Integrated Door Opening Assemblies.
- B. Section 08 06 71 – Door Hardware Schedule.
- C. Section 08 06 80 – Glazing Schedule.
- D. Section 08 10 00 – Doors and Frames.
- E. Section 08 12 16 – Aluminum Frames.
- F. Section 08 42 13 – Aluminum-Framed Entrances.
- G. Section 08 71 00 – Door Hardware.
- H. Section 08 91 26 – Door Louvers.

1.03 REFERENCES

- A. [AAMA 1304](#) – Voluntary Specification for Forced Entry Resistance of Side-Hinged Door Systems.
- B. [ASTM-D256](#) – Standard Test Methods for Determining the Pendulum Impact Resistance of Plastics.
- C. [ASTM-D-4226](#) – Standard Test Methods for Impact Resistance of Rigid Poly(Vinyl Chloride) (PVC) Building Products
- D. [ASTM-D570](#) – Standard Test Method for Water Absorption of Plastics.
- E. [ASTM-D638](#) – Standard Test Method for Tensile Properties of Plastics.
- F. [ASTM-D695](#) – Standard Test Method for Compression Properties of Rigid Plastics.
- G. [ASTM-D696](#) – Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30 °C and 30 °C with a Vitreous Silica Dilatometer.
- H. [ASTM-D790](#) – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- I. [ASTM-D792](#) – Standard Test Method for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
- J. [ASTM-D1761](#) – Standard Test Methods for Mechanical Fasteners in Wood.
- K. [ASTM-D2344](#) – Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates.
- L. [ASTM-D2583](#) – Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impresser.
- M. [ASTM-D2794](#) – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- N. [ASTM-D5116](#) – Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/ Products.
- O. [ASTM-D6670](#) – Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/ Products.
- P. [ASTM-E84](#) – Standard Test Method for Surface Burning Characteristics of Building Materials.
- Q. [ASTM-E90](#) – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.

- R. [ASTM-G-53](#) - Standard Practice for Operating Light-and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials
- S. [NFRC 100](#) – Procedure for Determining Fenestration Products U-Factors.
- T. [NFRC 400](#) – Procedure for Determining Fenestration Products Air Leakage.

1.04 SUBMITTALS

- A. Must comply with Section 01 33 00 – Submittal Procedures.
- B. Action Submittals/ Informational Submittals.
 - 1. Product Data.
 - a. Submit manufacturer's product data sheets, catalog pages illustrating the products, description of materials, components, fabrication, finishes, installation instructions, and applicable test reports.
 - 2. Shop Drawings.
 - a. Submit manufacturer's shop drawings, including elevations, sections, and details indicating dimensions, tolerances, materials, fabrication, doors, panels, framing, hardware schedule, and finish.
 - 3. Testing and Evaluation Reports.
 - a. Submit testing reports and evaluations provided by manufacturer conducted by and accredited independent testing agency certifying doors and frames comply with specified performance requirements listed in Section 2.04.
- C. Closeout Submittals.
 - 1. Operation and Maintenance Manual.
 - a. Submit manufacturer's maintenance and cleaning instructions for doors and frames, including maintenance and operating instructions for hardware.
 - 2. Warranty Documentation.
 - a. Submit manufacturer's standard warranty.

1.05 QUALITY ASSURANCE

- A. Manufacturer's Qualifications.
 - 1. Continuously engaged in manufacturing of doors of similar type to that specified, with a minimum of 20 years concurrent successful experience.
 - 2. Door and frame components must be fabricated by same manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Delivery.
 - 1. Deliver materials to site in manufacturer's original, unopened, containers and packaging.
 - 2. Labels clearly identifying opening, door mark, and manufacturer.
- B. Storage.
 - 1. Store materials in a clean, dry area, indoors in accordance with manufacturer's instructions.
- C. Handling.
 - 1. Protect materials and finish from damage during handling and installation.

1.07 WARRANTY

- A. Warrant doors, frames, and factory installed hardware against failure in materials and workmanship, including excessive deflection, faulty operation, defects in hardware installation, and deterioration of finish or construction in excess of normal weathering.
- B. Standard Period.
 - 1. Ten years starting on date of shipment.
- C. Limited lifetime
 - 1. Covers failure of corner joinery, core deterioration, and delamination or bubbling of door skin and corrosion of all-fiberglass products while the door is in its specified application in its original installation.
- D. Finish
 - 1. Painted AF-200, AF-150 frames, AF-250 frames: 3 years.
 - 2. Thresholds do not have a finish warranty.

PART 2 PRODUCTS

2.01 COMPOSITE FIBERGLASS DOOR

- A. Manufacturer.
 - 1. Special-Lite, Inc.
 - 2. Approved Equals

2.02 DESCRIPTION

- A. Door Opening Size.
 - 1. As scheduled
- B. Construction.
 - 1. Door Thickness.
 - a. 1-3/4".
 - 2. Stiles & Rails.
 - a. Pultruded fiberglass with integral channels for securing corner reinforcing clip.
 - 3. Corners.
 - a. Mitered.
 - b. Secured with pultruded fiberglass corner clip chemically welded to stiles and rails.
 - c. Mechanical fasteners to secure corner joints not acceptable.
 - 4. Core.
 - a. Expanded Polystyrene.
 - b. Expanded Polystyrene.
 - 1. 2.0 pcf
 - 2. Mildew and rot resistant.
 - 3. Sound and vibration dampening.
 - 5. Face Sheet.
 - a. Interior and Exterior
 - 1. 0.090" thick, Class C, smooth texture, painted FRP sheet.
 - b. Attachment of face sheet.
 - 1. Face sheets to be flame treated to promote durable, long lasting bond.
 - 2. Face sheets adhered to stiles, rails, and core using hot melt adhesive evenly coated across all surfaces to produce strong bond and prevent moisture absorption.
 - 6. Cutouts.
 - a. Manufacture doors with cutouts for required vision lites, louvers, and panels.
 - 7. Hardware.
 - a. Pre-machine doors in accordance with templates from specified hardware manufacturers.
 - b. Surface mounted closures will be reinforced for but not prepped or installed at factory.
 - 8. Reinforcements.
 - a. Solid high-density polyurethane shapes chemically welded to stiles, rails and/ or core.
 - b. No metallic reinforcements will be allowed.

2.03 FRAMING

- A. Framing
 - 1. [Jamb Depth.](#)
 - a. 5-3/4".
 - 2. Materials.
 - a. [See 2.05.A.](#)
 - 3. Perimeter Frame Members.
 - a. 1/4" thick pultruded fiberglass open throat with return.
 - b. Factory fabricated.
 - c. 2" or 4" face available for frame headers.
 - 4. Integral Door Stops.
 - a. 5/8" x 2-1/4".
 - 5. Frame Assembly.
 - 1. Optional chemically welded consult factory for details.

- f. Frame Member to Member Connections.
 - 1. Corners mitered with 4" x 4" x 3/8" pultruded FRP angle reinforcement with interlocking pultruded FRP brackets.
- g. Reinforcements.
 - 1. Standard.
 - a. 1/4" thick pultruded FRP chemically welded to frame at all hinge, strike, and closer locations.
- h. Hardware
 - 1. Pre-machine and reinforce frame members for hardware in accordance with manufacturer's standards and door hardware schedule.
 - 2. Surface mounted closures will be reinforced for but not prepped or installed at factory.
- i. Anchors:
 - 1. Drywall.
 - a. Standard jamb anchor tuck.
 - b. KD wrap.
 - c. Optional punch and dimple tuck with either metal or wood studs.

2.04 PERFORMANCE

A. Face Sheet.

- 1. Standard Interior and Exterior Class C 0.090" thick, smooth texture, painted FRP sheet.
 - a. Flexural Strength, ASTM-D790: 14×10^3 psi.
 - b. Flexural Modulus, ASTM-D790: 0.4×10^6 psi.
 - c. Tensile Strength, ASTM-D638: 6×10^3 psi.
 - d. Tensile Modulus, ASTM-D638: 0.4×10^6 psi.
 - e. Barcol Hardness, ASTM-D2583: 35.
 - f. Izod Impact, ASTM-D256: 5.0 ft-lb/in.
 - g. Water Absorption, ASTM-D570: 0.16%/24hrs at 77°F.
 - h. Surface Burning, ASTM-E84: Flame Spread ≤ 200 , Smoke Developed ≤ 450 .
 - i. Meets USDA/ FSIS requirements.
 - j. GreenGuard Certified.

B. Pultruded Structural Shapes.

- 1. Tensile Strength, ASTM-D638: Minimum 30,000 psi.
- 2. Compressive Strength, ASTM-D695: Minimum 30,000 psi.
- 3. Flexural Strength, ASTM-D790: Minimum 30,000 psi.
- 4. Tensile Strength, ASTM-D638: Minimum psi.
- 5. Flexural Modulus, ASTM-D790: Minimum 1.6×10^6 psi.
- 6. Short Beam Shear, ASTM-D2344: Minimum 4,500 psi.
- 7. Impact, Notched, ASTM-D256: Minimum 25 ft-lb/in.
- 8. Thermal Expansion, ASTM-D696: Maximum 8.0×10^{-6} psi.
- 9. Surface Burning, ASTM-E84: Flame Spread ≤ 25 , Smoke Developed ≤ 450 .
- 10. Fastener Withdrawal, ASTM-D1761: 894 lbs.

C. Framing.

- 1. Tensile Strength, ASTM-D638: Minimum 30,000 psi.
- 2. Compressive Strength, ASTM-D695: Minimum 30,000 psi.
- 3. Flexural Strength, ASTM-D790: Minimum 30,000 psi.
- 4. Tensile Strength, ASTM-D638: Minimum psi.
- 5. Flexural Modulus, ASTM-D790: Minimum 1.6×10^6 psi.
- 6. Short Beam Shear, ASTM-D2344: Minimum 4,500 psi.
- 7. Impact, Notched, ASTM-D256: Minimum 25 ft-lb/in.
- 8. Thermal Expansion, ASTM-D696: Maximum 8.0×10^{-6} psi.
- 9. Surface Burning, ASTM-E84: Flame Spread ≤ 25 , Smoke Developed ≤ 450 .
- 10. Fastener Withdrawal, ASTM-D1761: 924 lbs.
- 11. Percent Fiberglass: Minimum 50%.

D. Door and Frame Assembly.

- 1. Expanded Polystyrene Core.
 - a. Thermal Transmittance, NFRC 100.
 - 1. Opaque Swinging Door (< than 50% glass)
 - a. U-Factor = 0.24 Btu/hr-ft²-°F.
 - 2. Commercially Glazed Swinging Entrance Door (> than 50% glass)

- a. U-Factor = 0.43 Btu/hr-ft²-°F.
- b. Air Leakage, NFRC 400, ASTM-E283.
 1. Opaque Swinging Door (< than 50% glass)
 - a. 0.02 cfm/sqft @ 1.57 psf.
 - b. 0.06 cfm/sqft @ 6.24 psf.
 2. Commercially Glazed Swinging Entrance Door (> than 50% glass)
 - a. 0.30 cfm/sqft @ 1.57 psf.
 - b. 0.53 cfm/sqft @ 6.24 psf.
- c. STC and OITC, ASTM-E90: STC = 30, OITC = 30.

2.05 MATERIALS

- A. Fiberglass.
 1. Face Sheet.
 - a. [See 2.04.A.](#)
 2. Stiles & Rails.
 - a. [See 2.04.B.](#)
 3. Framing
 - a. [See 2.04.C.](#)
- B. Fasteners.
 1. All exposed fasteners will have a finish to match material being fastened.
 2. 410 stainless steel or other non-corrosive metal.
 3. Must be compatible with items being fastened.

2.06 FABRICATION

- A. Factory Assembly.
 1. Door and frame components from the same manufacturer.
 2. Required size for door and frame units, shall be as indicated on the drawings.
 3. Complete cutting, fitting, forming, drilling, and grinding of metal before assembly.
 4. All cut edges to be free of burs.
 5. Electrical arc welding of doors or frames is not acceptable.
 6. Maintain continuity of line and accurate relation of planes and angles.
 7. Secure attachments and support at mechanical joints with hairline fit at contact surfaces.
- B. Shop Fabrication
 1. All shop fabrication to be completed in accordance with manufactures process work instructions.
 2. Quality control to be performed before leaving each department.

2.07 FINISHES

- A. Door.
 1. Two-component flexible acrylic urethane Satin topcoat. (STANDARD)
 - a. [Color.](#)
 1. Primed Only.
 - b. Custom colors available consult manufacturer.
 - c. Excellent exterior durability.
 - d. Unique, high-solids, high-build, multifunctional coating.
 - e. Low VOC, Satin coating.
 - f. Impact Resistance, ASTM D-4226 Minimum 1.2 in/lb/mil
 - g. Color retention: $\leq 1\Delta$ (CIE L.a.b.), Montreal 45° South: 12 months
 - h. Very good chemical resistance.
- B. Frame
 1. Fiberglass.
 2. Two-component flexible acrylic urethane Satin topcoat. (STANDARD)
 - a. [Color.](#)
 1. Primed Only.

- b. Custom colors available consult manufacturer.
- c. Excellent exterior durability.
- d. Unique, high-solids, high-build, multifunctional coating.
- e. Low VOC, Satin coating.
- f. Impact Resistance, ASTM D-4226 Minimum 1.2 in/lb/mil
- g. Color retention: $\leq 1\Delta$ (CIE L.a.b.), Montreal 45° South: 12 months
- h. Very good chemical resistance.

2.08 ACCESSORIES

A. Hardware.

- 1. Pre-machine doors in accordance with templates from specified hardware manufactures and hardware schedule.
- 2. Hardware Schedule.
 - a. As indicated on the drawings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas to receive doors.
- B. Notify architect of conditions that would adversely affect installation or subsequent use.
- C. Do not proceed with installation until unsatisfactory conditions are corrected.

3.02 PREPARATION

- A. Ensure openings to receive frames are plumb, level, square, and in tolerance.

3.03 ERECTION

- A. Install doors in accordance with manufacturer's instructions.
- B. Install doors plumb, level, square, true to line, and without warp or rack.
- C. Anchor frames securely in place.
- D. Separate aluminum from other metal surfaces with bituminous coatings or other means approved by architect.
- E. Set thresholds in bed of mastic and back seal.
- F. Install exterior doors to be weathertight in closed position.
- G. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by architect.
- H. Remove and replace damaged components that cannot be successfully repaired as determined by architect.

3.04 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services.
 - 1. Manufacturer's representative shall provide technical assistance and guidance for installation of doors.

3.05 ADJUSTING

- A. Adjust doors, hinges, and locksets for smooth operation without binding.

3.06 CLEANING

- A. Clean doors promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that would damage finish.

3.07 PROTECTION

- A. Protect installed doors to ensure that, except for normal weathering, doors will be without damage or deterioration at time of substantial completion.

SECTION 083340 – ROLLING COUNTER DOORS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. All of the Contract Documents, including General and supplementary Conditions, and Division 1 General Requirements, apply to the work of this Section.

1.2 SUMMARY

- A. The work of this Section includes rolling counter doors (located at concession stand).
- B. Related Sections: Other specification sections which directly relate to the work of this Section include, but are not limited to, the following:
 - 1. Division 09 Sections for finish painting of exposed non-stainless steel items.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each type of rolling counter door. Include both published data and any specific data prepared for this project.
- B. Shop Drawings: Submit shop drawings for approval prior to fabrication. Include detailed plans, elevations, details of framing members, required clearances, anchors, and accessories. Include relationship with adjacent materials.
- C. Operation and Maintenance Data.

1.4 QUALITY ASSURANCE

- A. Manufacturer: Rolling counter doors shall be manufacturer by a firm with a minimum of five years experience in the fabrication and installation of rolling counter doors. Manufacturers proposed for use, which are not named in these specifications, shall submit evidence of ability to meet performance and fabrication requirements specified, and include a list of five projects of similar design and complexity completed within the past five years. Information must be received a minimum of fourteen days prior to bid to be considered.
- B. Installer: Installation of rolling counter doors shall be performed by the authorized representative of the manufacturer.
- C. Single-Source Responsibility: Provide doors, guides, motors, and related primary components from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.
- D. Pre-Installation Conference: Schedule and convene a pre-installation conference just prior to commencement of field operations, to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials and products in labeled protective packages. Store and handle in strict compliance with manufacturer's instructions and recommendations. Protect from damage from weather, excessive temperatures and construction operations.

PART 2 PRODUCTS

2.1 MANUFACTURERS

ROLLING COUNTER DOORS

- A. Provide rolling counter doors by Overhead Door Corporation, (basis of design) Pennsylvania Division; Telephone 800-929-2553.

- B. Requests for substitutions will be considered in accordance with provisions of Division 1 Sections. Manufacturer must be same manufacturer supplying the rolling counter fire doors specified in section 08332.

2.2 COUNTER DOORS

- A. Trade Reference: 651 Series Counter Doors by Overhead Door Corporation.
- B. .Curtain: Interlocking slats, Type F-128 fabricated of stainless steel. Endlocks shall be attached to alternate slats to maintain curtain alignment and prevent lateral slat movement.
- C. Finish: Slats and hood shall be stainless steel #4 satin finish.
- D. Bottom Bar: Single stainless steel angle bottom bar with weather stripping.
- E. Guides: Stainless steel #4 satin finish.
- F. Brackets: Steel plate to support counterbalance, curtain and hood.
- G. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel.
- H. Hood: Stainless steel #4 satin finish. Provide intermediate support brackets as required.
- I. Manual Operation: Manual push up.
- J. Locking: Slide bolt locks suitable for use with padlock and made of stainless steel.
- K. Wall Mounting Condition: Face-of-wall mounting.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Before beginning work, verify that openings have been properly prepared.
- B. Take field dimension and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Strictly comply with manufacturers installation instructions and recommendations. Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.
- B. Install doors plumb, level, and operating smoothly without binding. Provide all fasteners, accessories, and incidentals involved to provide a fully operational door unit. Coordinate with kitchen equipment supplier for cut-outs, openings, etc. Installer is responsible for replacement of any damaged kitchen equipment, counters, etc. caused by the installation of the door unit.
- C. Instruct Owners personnel in proper operating procedures and maintenance schedule.

3.3 ADJUSTING AND CLEANING

- A. Test rolling counter doors for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Touch-up damaged coatings and finishes and repair minor damage. Clean exposed surfaces using non-abrasive materials and methods recommended by manufacturer of material or product being cleaned..

END OF SECTION

SECTION 08 43 13 - ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum-framed storefront, with vision glass.
- B. Aluminum doors and frames.
- C. Weatherstripping.
- D. Door hardware.

1.2 RELATED REQUIREMENTS

- A. Section 072500 - Weather Barriers / Air Barriers: Sealing framing to weather barrier installed on adjacent construction.
- B. Section 079200 - Joint Sealants: Sealing joints between frames and adjacent construction.
- C. Section 084413 - Glazed Aluminum Curtain Walls.
- D. Section 087100 - Door Hardware: Hardware items other than specified in this section.
- E. Section 088000 - Glazing: Glass and glazing accessories.

1.3 REFERENCE STANDARDS

- A. AAMA 101 - Standard Test Method for Exterior Windows, Curtain Walls and Doors for Air Leakage; American Architectural Manufacturers Association; 2005.
- B. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.
- C. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
- D. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.
- E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2013.
- F. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.
- G. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
- H. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.

- I. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).
- J. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015.
- K. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes; 2014.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.5 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.
- D. Samples: Submit two samples 12 x 12 inches in size illustrating finished aluminum surface, glass, glazing materials.
- E. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- F. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.
- G. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- H. Report of field testing for water leakage.
- I. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.6 QUALITY ASSURANCE

- A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at the State in which the Project is located.
- B. Manufacturer and Installer Qualifications: Company specializing in manufacturing aluminum glazing systems with minimum three years of documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.8 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.9 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within 5 years after the date of Substantial Completion.
- C. Provide five-year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- D. Provide five-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.1 STOREFRONT

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
 - 1. Glazing Rabbet: Coordinate glazing thickness and glazing channel depth with performance requirements.
 - 2. Glazing Position: Front-set.
 - 3. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.
 - 4. Finish: High performance organic coatings.
 - 5. Factory finish all surfaces that will be exposed in completed assemblies.
 - 6. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
 - 7. Finish Color: To be selected by Architect from manufacturer's custom range.
 - 8. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
 - 9. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
 - 10. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
 - 11. Movement: Allow for movement between storefront and adjacent construction,

without damage to components or deterioration of seals.

12. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
13. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glazing and heel bead of glazing compound.
14. Stack lumber flat with spacers beneath and between each bundle to provide air circulation.

B. Performance Requirements:

1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
 - a. Wind Speed 159MPH
 - b. Refer to Structural drawings for further description of Design Wind loads.
 - c. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
2. Wind-Borne-Debris Resistance: Identical full-size glazed assembly without auxiliary protection, tested by independent agency in accordance with ASTM E1996 for Wind Zone 1 - Enhanced Protection for Large and Small Missile impact and pressure cycling at design wind pressure.
3. Water Penetration Resistance: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 10 psf.
4. Air Leakage Certification: The air leakage of window and sliding or swinging door assemblies that are part of the building envelope shall be determined in accordance with AAMA/WDMA/CSA 101/I.S.2/A440, or NFRC 400 by an accredited, independent laboratory, and labeled and certified by the manufacturer. The label shall be present at the time of installation and remain till inspection by local build codes.
5. Air Leakage: Maximum of 0.06 cu ft/min sq ft of wall area, when tested in accordance with ASTM E283 at 6.27 psf pressure differential across assembly.
6. Condensation Resistance Factor of Framing: 50, minimum, measured in accordance with AAMA 1503.

2.2 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
1. Framing members for interior applications need not be thermally broken.
 2. Glazing Stops: Flush.
- B. Glazing: As specified in Section 088000.
1. Coordinate glazing thickness and glazing channel depth with performance requirements.
- C. Swing Doors: Glazed aluminum.
1. Thickness: 1-3/4 inches.
 2. Top Rail: 4 inches wide.
 3. Vertical Stiles: 4-1/2 inches wide.
 4. Bottom Rail: 10 inches wide.
 5. Glazing Stops: Square.
 6. Finish: Same as storefront.

2.3 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Fasteners: Stainless steel.
- C. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

2.4 FINISHES

- A. High Performance Organic Coatings: AAMA 2604; multiple coats, thermally cured fluoropolymer system.
- B. Color: As selected by Architect from manufacturer's standard range.
- C. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.5 HARDWARE

- A. For each door, include weatherstripping, sill sweep strip, and threshold.
- B. Other Door Hardware: As specified in Section 087100.
- C. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
- D. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.
- E. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all doors.

PART 3 EXECUTION

3.1 EXAMINATION

- F. Verify dimensions, tolerances, and method of attachment with other work.
- G. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.2 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.

- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form watertight dam.
- G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Set thresholds in bed of sealant and secure.
- J. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.3 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32inch.

3.4 ADJUSTING

- A. Adjust operating hardware and sash for smooth operation.

3.5 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

3.6 PROTECTION

- A. Protect installed products from damage during subsequent construction.

END OF SECTION 08 43 13

SECTION 08 56 59 - SERVICE AND TELLER WINDOW UNIT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Manual pass, service and teller window units.
 - 2. Glazing.
- B. Related Sections:
 - 1. Section 04- Reinforced Unit Masonry, Partition construction [___ CMU ____].

1.2 REFERENCES

- A. American Architectural Manufacturers Association:
 - 1. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
 - 2. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
- B. American Society Mechanical Engineers Standards:
 - 1. ASME SA-240/SA-240M - Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
- C. ASTM International:
 - 1. ASTM A27/A27M - Standard Specification for Steel Castings, Carbon, for General Application.
 - 2. ASTM A 36/A 36M. - Standard Specification for Carbon Structural Steel.
 - 3. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings.
 - 4. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - 5. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 6. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
 - 7. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 8. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
 - 9. ASTM B221/B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 10. ASTM C1036 - Standard Specification for Flat Glass.
 - 11. ASTM C1048 - Standard Specification for Heat-Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass.
 - 12. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

Mobile, Alabama

13. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics.
14. ASTM E488 - Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements.
15. ASTM E699 - Standard Practice for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating of Building Components.
16. ASTM E2188 - Standard Test Method for Insulating Glass Unit Performance.
17. ASTM E2189 - Standard Test Method for Testing Resistance to Fogging in Insulating Glass Units.
18. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.
19. ASTM F588 - Standard Test Methods for Resistance of Window Assemblies to Forced Entry Excluding Glazing.
20. ASTM F2329 - Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.

D. Consumer Products Safety Commission:

1. CPSC 16 CFR 1201 - Safety Standard for Architectural Glazing.

E. National Association of Architectural Metal Manufacturers.

1. NAAMM No. 3 Finish: Ground unidirectional uniform finish obtained with 80 - 100 grit abrasive.

F. SAE International:

1. AMS5511 - Steel, Corrosion-Resistant, Sheet, Strip, and Plate, 19Cr - 9.5Ni (304L), Solution Heat Treated.
2. AMS5513 - Steel, Corrosion-Resistant, Sheet, Strip, and Plate 19cr 9.2Ni (SAE 30304) Solution Heat Treated.

G. Steel Structures Painting Council:

1. SSPC Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).

1.3 PERFORMANCE REQUIREMENTS

- A. System Design: Design and size components to withstand dead loads and live loads caused by pressure and negative wind loads acting normal to plane of window as calculated in accordance with applicable code.
- B. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, and migrating moisture occurring within system, to exterior by weep drainage network.
- C. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with [inside] pane of glass and heel bead of glazing compound. [Position thermal insulation on exterior surface of air barrier and vapor retarder.]

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures {01330 - Submittal Procedures}: Requirements for submittals.
- B. Shop Drawings:
 - 1. Indicate configuration, sizes, rough-in, mounting, construction and glazing details as well as installation clearances and finishes.
- C. Product Data:
 - 1. Submit manufacturer's product data for specified Products indicating materials, operation characteristics, and finishes.
- D. Samples:
 - 1. Submit two samples, 4 x 4 inches (100 x 100 mm) in size illustrating metal finishes for each finish specified.
- E. Manufacturer's Installation Instructions:
 - 1. Submit installation instructions with requirements to accommodate specific site conditions.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum 10 years documented experience.
 - 1. Participates in a Quality Assurance validation Program.
 - a. Facility Audit.
- B. Installer: Company specializing in installation of window systems specified with minimum three years documented experience.

1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Section 01 60 00 - Product Requirements {01600 - Product Requirements}: Requirements for transporting, handling, storing, and protecting products.
- B. Ordering: To avoid construction delays comply with ordering instructions and lead time requirements as set by window system manufacturer.
- C. Pack window units and accessories in manufacturer's standard shipping containers and protective packaging. Deliver units in manufacturer's original packaging and unopened containers with identification labels intact.
- D. Store window units and accessories on raised blocks to prevent moisture damage protected from exposure to weather and vandalism.

1.7 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication and record on shop drawings.

1.8 COORDINATION

- A. Section 01 30 00 - Administrative Requirements {01300 - Administrative Requirements}: Requirements for coordination.
- B. Coordinate work with adjacent materials specified in other Sections and as indicated on Drawings and approved shop drawings.

1.9 WARRANTY

- A. Furnish manufacturer's standard warranty document, executed by an authorized Quikserv Corp. officer in which manufacturer agrees to repair or replace windows, drawers and air curtains that fail in materials or workmanship within specified warranty period. This warranty is in addition to, and not a limitation of other rights Owner has under the contract.
 - 1. Warranty Period:
 - a. One year parts and labor from date of installation.
 - 2. Failures include, but are not limited to, the following:
 - a. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
 - b. Structural failures including deflections exceeding 1/4 inch.
 - c. Failure of welds.
 - d. Excessive air leakage.
 - e. Faulty operation of sliding window hardware.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Aluminum Extrusions: ASTM B221/B221M. Provide alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000-psi (150-MPa) ultimate tensile strength and not less than 0.125 inch (3.2 mm) thick at any location for main frame and sash members.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Metallic-Coated Steel Sheet:
 - 1. ASTM A653/A653M, CS (Commercial Steel), Type B; with G90 (Z275)zinc (galvanized) coating designation.
 - 2. AMS5511, steel, corrosion-resistant, sheet, strip, and plate, 19Cr - 9.5Ni (304L), solution heat treated.
 - 3. AMS5513, steel, corrosion-resistant, sheet, strip, and plate 19cr 9.2Ni (SAE 30304) solution heat treated.
- D. Stainless Steel Sheet, Strip, Plate, and Flat Bars:
 - 1. ASTM A666, austenitic stainless steel, Type 304, stretcher-leveled standard of flatness.
 - 2. ASME SA-240/SA-240M, chromium and chromium-nickel stainless steel plate, sheet, and strip for general applications.

- E. Concealed Bolts: ASTM A307, Grade A unless otherwise indicated.
- F. Cast-in-Place Anchors in Concrete: Fabricated from corrosion-resistant materials capable of sustaining, without failure, a load equal to four times the load imposed, as determined by testing per ASTM E488, conducted by a qualified testing agency.
 - 1. Threaded or wedge type; galvanized ferrous castings, either ASTM A27/A27M cast steel or ASTM A47/A47M malleable iron. Provide bolts, washers, and shims as required; hot-dip galvanized per ASTM A153/A153M or ASTM F2329.
- G. Embedded Plate Anchors: Fabricated from steel shapes and plates, minimum 3/16 inch (4.8 mm) thick; with minimum 1/2-inch- (12.7-mm-) diameter, headed studs welded to back of plate..
- H. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- I. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30-mil (0.76-mm) thickness per coat.
- J. Sealants: For sealants required within fabricated security windows, provide type recommended by manufacturer for joint size and movement. Sealant shall remain permanently elastic, nonshrinking, and nonmigrating.
- K. Gaskets: For gaskets required within fabricated security windows, provide type recommended by manufacturer for joint size and movement. Gaskets shall remain permanently elastic, nonshrinking, and nonmigrating.

2.2 WINDOW COMPONENTS

- A. Comply with requirements of UL listing for ballistics-resistance levels as specified.
- B. Glass:
 - 1. Tempered Glass: 1/4 inch thick.
- C. Track/Slides: Stainless steel ball bearing slides all windows and drawers.
- D. Miscellaneous Glazing Materials: Provide material, size, and shape complying with requirements of glass manufacturers, and with a proven record of compatibility with surfaces contacted in installation:
 - 1. Cleaners, Primers, and Sealers: Type recommended by sealant or gasket manufacturer.
 - 2. Setting Blocks: Elastomeric material with a Type A Shore durometer hardness of 85, plus or minus 5.
 - 3. Spacers: Elastomeric blocks or continuous extrusions with a Type A Shore durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
 - 4. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

- E. Flashing.
- F. Welding Materials.
- G. Anchors, Clips, and Window Accessories: Stainless steel; hot-dip, zinc-coated steel or iron, of sufficient strength to withstand design pressure indicated.

2.3 MANUAL EXTERIOR AND INTERIOR PASS, SERVICE AND TELLER WINDOW UNITS

- A. Manufacturers:
 - 1. Quikserv Corp.
 - a. Model CM-1 (Bi-Folding Window Unit):
 - 1) Service Opening: 16 inches (w) x 32 inches (h).
 - 2) Rough Opening: 24-3/8 inches (w) x 38-7/8 inches (h).
 - 3) Glazing: 1/4 inch tempered.
 - 4) Finish: [Bronze.] [Clear.] [Custom Color.]
 - b. Model PW-3 (Bi-Folding Window Unit):
 - 1) Service Opening: 14 inches (w) x 18-1/4 inches (h).
 - 2) Rough Opening: 28-1/8 inches (w) x 40-3/8 inches (h).
 - 3) Glazing: 1/4 inch tempered.
 - 4) Finish: [Bronze.] [Clear.] [Custom Color.]
 - c. Model PW-4 (Bi-Folding Window Unit):
 - 1) Service Opening: 14 inches (w) x 24-1/4 inches (h).
 - 2) Rough Opening: 28-1/8 inches (w) x 40-3/8 inches (h).
 - 3) Glazing: 1/4 inch tempered.
 - 4) Finish: [Bronze.] [Clear.] [Custom Color.]
 - 2. Substitutions: [In accordance with Contract Documents.] [Not Permitted.]

2.4 GLAZING

- A. Tinted Glass: Tempered float glass as specified; Class 2 tinted.
 - 1. Tinted tempered glass (FG-TT).
 - 2. Minimum Thickness: 1/4 inch.
 - 3. Tint: Tint color as indicated on Drawings, if not indicated on Drawings as selected by Architect.

2.5 FABRICATION

- A. Fabricate window to dimensions indicated on Drawings.
- B. Provide weep holes and internal water passages for exterior security windows to conduct infiltrating water to the exterior.
- C. Rigidly fit and secure joints and corners with internal reinforcement. Make joints and connections flush, hairline, and weatherproof. Fully weld corners.

1. Fabricate framing with manufacturer's standard, internal opaque armoring in thicknesses required for security windows to comply with ballistics-resistance performance indicated.
- D. Prepare components with reinforcement required for hardware.
- E. Welding: To greatest extent possible, weld before finishing and in concealed locations to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- F. Metal Protection: Separate dissimilar metals to protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
- G. Factory-cut openings in glazing for speaking apertures.
- H. Preglazed Fabrication: Preglaze window units at factory, where required for applications indicated.
- I. Weather Stripping: Factory applied.
- J. Bottom Sills: Stainless steel construction, no bottom tracks and no pop rivets.
- K. Handles: Stainless steel, manufacturer's standard profile and finish.

2.6 SHOP FINISHING

- A. Aluminum Finishes:
 1. Mill Finished Aluminum Surfaces: manufacturer's standard finish.
 2. Clear Anodized Aluminum Surfaces: AA-M10C22A31 non-specular as fabricated mechanical finish, medium matte chemical finish, and Architectural Class II 0.7 mils (0.018 mm) clear anodized coating.
 - a. Conform to AAMA 611
- B. Concealed Steel Items: [Galvanized in accordance with ASTM A123 to thickness Grade 85, 2.0 oz/sq ft (610 gm/sq m).
- C. Stainless Steel: 304 Stainless Steel with NAAMM No. 3 finish.
- D. Apply bituminous paint to concealed metal surfaces in contact with cementitious or dissimilar materials.
- E. Touch-Up Primer for Galvanized Steel Surfaces: SSPC Paint 20 zinc rich.
- F. Extent of Finish:
 1. Apply factory coating to all surfaces exposed at completed assemblies.
 2. Apply finish to surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

3. Apply touch-up materials recommended by coating manufacturer for field application to cut ends and minor damage to factory applied finish.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements {01300 - Administrative Requirements}: Verification of existing conditions before starting work.
- B. Verify construction is ready to receive Products specified in this section.
- C. Verify rough openings are correct size and in correct location.
- D. Examine roughing-in for embedded and built-in anchors to verify actual locations of security window connections before security window installation.
- E. Inspect built-in and cast-in anchor installations, before installing security windows, to verify that anchor installations comply with requirements. Prepare inspection reports.
 1. Remove and replace anchors where inspections indicate that they do not comply with specified requirements. Reinspect after repairs or replacements are made.
 2. Perform additional inspections to determine compliance of replaced or additional work. Prepare anchor inspection reports.
- F. For glazing materials whose orientation is critical for performance, verify installation orientation.
- G. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Furnish frames and anchors to other sections as required for installation in surrounding partition and casework construction.

3.3 INSTALLATION

- A. Install Products in accordance with manufacturer's instructions.
- B. Align Products plumb, level and square.
- C. Rigidly secure Products to adjacent supporting construction.
- D. Glaze windows in accordance with manufacturer's instructions and Section 08.
- E. Seal perimeter joints
- F. Protection: Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended in writing by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

3.4 ADJUSTING

- A. Section 01 70 00 - Execution and Closeout Requirements {01700 - Execution Requirements}: Requirements for adjusting.
- B. Adjust horizontal-sliding, transaction security windows to provide a tight fit at contact points for smooth operation and a secure enclosure.
- C. Adjust transaction drawers to provide a tight fit at contact points for smooth operation and weathertight and secure enclosure.
- D. Remove and replace defective work, including security windows that are warped, bowed, or otherwise unacceptable.

3.5 CLEANING AND PROTECTION

- A. Section 01 70 00 - Execution and Closeout Requirements {01700 - Execution Requirements}: Requirements for cleaning.
- B. Remove protective material from factory finished surfaces.
- C. Wash surfaces by method recommended and acceptable to sealant and window manufacturer; rinse and wipe surfaces clean.
- D. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant and window manufacturer.
- E. Clean metal and glass surfaces to polished condition.
 - 1. Lubricate sliding security window hardware.
 - 2. Lubricate transaction drawer hardware.
- F. Provide temporary protection to ensure that security windows are without damage at time of Substantial Completion.

END OF SECTION 08 56 59

SECTION 08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY:

- A. Section Includes: Finish Hardware for door openings, except as otherwise specified herein.
 - 1. Door hardware for steel (hollow metal) doors.
 - 2. Door hardware for aluminum doors.
 - 3. Door hardware for wood doors.
 - 4. Door hardware for other doors indicated.
 - 5. Keyed cylinders as indicated.
- B. Related Sections:
 - 1. Division 06: Rough Carpentry.
 - 2. Division 08: FRP Doors and Frames
 - 3. Division 08: Sliding Doors.
- C. References: Comply with applicable requirements of the following standards. Where these standards conflict with other specific requirements, the most restrictive shall govern.
 - 1. Builders Hardware Manufacturing Association (BHMA)
 - 2. NFPA 101 Life Safety Code, 2010
 - 3. NFPA 80 - Standard for Fire Doors and Windows, 2013
 - 4. ANSI-A156.xx- Various Performance Standards for Finish Hardware
 - 5. UL10C – Positive Pressure Fire Test of Door Assemblies
 - 6. ANSI-A117.1 – Accessible and Usable Buildings and Facilities
 - 7. DHI /ANSI A115.IG – Installation Guide for Doors and Hardware
 - 8. IBC – International Building Code, 2015
- D. Intent of Hardware Groups
 - 1. Should items of hardware not definitely specified be required for completion of the Work, furnish such items of type and quality comparable to adjacent hardware and appropriate for service required.
 - 2. Where items of hardware are not definitely or correctly specified, but are required for completion of the Work, a written statement of such omission, error, or other discrepancy must be submitted to Architect, prior to date specified for receipt of bids for clarification by addendum. Otherwise, furnish such items in the type and quality established by this specification, and appropriate to the service intended.
- E. Allowances
 - 1. Refer to Division 01 for allowance amount and procedures.
- F. Alternates
 - 1. Refer to Division 01 for Alternates and procedures.

1.2 SUBSTITUTIONS:

- A. Comply with Division 01.

1.3 SUBMITTALS:

- A. Comply with Division 01.

- B. Special Submittal Requirements: Combine submittals of this Section with Sections listed below to ensure the "design intent" of the system/assembly is understood and can be reviewed together.
- C. Product Data: Manufacturer's specifications and technical data including the following:
1. Detailed specification of construction and fabrication.
 2. Manufacturer's installation instructions.
 3. Submit 6 copies of catalog cuts with hardware schedule.
 4. Provide 9001-Quality Management and 14001-Environmental Management for products listed in Materials Section 2.2
- D. Shop Drawings - Hardware Schedule: Submit 6 complete reproducible copy of detailed hardware schedule in a vertical format.
1. List groups and suffixes in proper sequence.
 2. Completely describe door and list architectural door number.
 3. Manufacturer, product name, and catalog number.
 4. Function, type, and style.
 5. Size and finish of each item.
 6. Mounting heights.
 7. Explanation of abbreviations and symbols used within schedule.
- E. Templates: Submit templates and "reviewed Hardware Schedule" to door and frame supplier and others as applicable to enable proper and accurate sizing and locations of cutouts and reinforcing.
- F. Samples: (If requested by the Architect)
1. 1 sample of Lever and Rose/Escutcheon design, (pair).
 2. 3 samples of metal finishes
- G. Contract Closeout Submittals: Comply with Division 01 including specific requirements indicated.
1. Operating and maintenance manuals: Submit 3 sets containing the following.
 - a. Complete information in care, maintenance, and adjustment, and data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Name, address, and phone number of local representatives for each manufacturer.
 - d. Parts list for each product.
 2. Copy of final hardware schedule, edited to reflect, "As installed".
 3. Copy of final keying schedule
 4. One set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

1.4 QUALITY ASSURANCE

- A. Comply with Division 01.
1. Statement of qualification for distributor and installers.
 2. Statement of compliance with regulatory requirements and single source responsibility.
 3. Distributor's Qualifications: Firm with 3 years' experience in the distribution of commercial hardware.
 - a. Distributor to employ full time Architectural Hardware Consultants (AHC) for the purpose of scheduling and coordinating hardware and establishing keying schedule.
 - b. Hardware Schedule shall be prepared and signed by an AHC.

4. Installer's Qualifications: Firm with 3 years of experience in installation of similar hardware to that required for this Project, including specific requirements indicated.
 5. Regulatory Label Requirements: Provide testing agency label or stamp on hardware for labeled openings.
- B. Provide UL listed hardware for labeled and 20-minute openings in conformance with requirements for class of opening scheduled.
1. Underwriters Laboratories requirements have precedence over this specification where conflict exists.
 2. Single Source Responsibility: Except where specified in hardware schedule, furnish products of only one manufacturer for each type of hardware.
- C. Review Project for extent of finish hardware required to complete the Work. Where there is a conflict between these Specifications and the existing hardware, notify the Architect in writing and furnish hardware in compliance with the Specification unless otherwise directed in writing by the Architect.
- 1.5 DELIVERY, STORAGE, AND HANDLING
- A. Packing and Shipping: Comply with Division 01.
1. Deliver products in original unopened packaging with legible manufacturer's identification.
 2. Package hardware to prevent damage during transit and storage.
 3. Mark hardware to correspond with "reviewed hardware schedule".
 4. Deliver hardware to door and frame manufacturer upon request.
- B. Storage and Protection: Comply with manufacturer's recommendations.
- 1.6 PROJECT CONDITIONS:
- A. Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security, and similar requirements indicated, as necessary for the proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents.
- B. Review Shop Drawings for doors and entrances to confirm that adequate provisions will be made for the proper installation of hardware.
- 1.7 WARRANTY:
- A. Refer to Conditions of the Contract
- B. Manufacturer's Warranty:
1. Closers: Ten years
 2. Exit Devices: Five years
 3. Locksets & Cylinders: Five years
 4. All other Hardware: Two years
- 1.8 OWNER'S INSTRUCTION:
- A. Instruct Owner's personnel in operation and maintenance of hardware units.

1.9 MAINTENANCE:

- A. Extra Service Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division 01 Closeout Submittals Section.
 - 1. Special Tools: Provide special wrenches and tools applicable to each different or special hardware component.
 - 2. Maintenance Tools: Provide maintenance tools and accessories supplied by hardware component manufacturer.
 - 3. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage, and protection of extra service materials.
- B. Maintenance Service: Submit for Owner's consideration maintenance service agreement for electronic products installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. The following manufacturers are approved subject to compliance with requirements of the Contract Documents. Approval of manufacturers other than those listed shall be in accordance with Division 01.
1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
 2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 MATERIALS:

- A. Hinges: Shall be Five Knuckle Ball bearing hinges
1. Template screw hole locations
 2. Bearings are to be fully hardened.
 3. Bearing shell is to be consistent shape with barrel.
 4. Minimum of 2 permanently lubricated non-detachable bearings on standard weight hinge and 4 permanently lubricated bearing on heavy weight hinges.
 5. Equip with easily seated, non-rising pins.
 6. Non-Removable Pin screws shall be slotted stainless steel screws.
 7. Hinges shall be full polished, front, back and barrel.
 8. Hinge pin is to be fully plated.
 9. Bearing assembly is to be installed after plating.
 10. Sufficient size to allow 180-degree swing of door
 11. Furnish five knuckles with flush ball bearings
 12. Provide hinge type as listed in schedule.
 13. Furnish 3 hinges per leaf to 7-foot, 6-inch height. Add one for each additional 30 inches in height or fraction thereof.
 14. Tested and approved by BHMA for all applicable ANSI Standards for type, size, function, and finish
 15. UL10C listed for Fire rated doors.
 16. Provide double-acting spring hinges as shown in hardware sets.
- B. Geared Continuous Hinges (at entrance doors):
1. Tested and approved by BHMA for ANSI A156.26-1996 Grade 1
 2. Anti-spinning through fastener
 3. UL10C listed for 3-hour fire rating
 4. Non-handed
 5. Lifetime warranty
 6. Provide Fire Pins for 3-hour fire ratings
 7. Sufficient size to permit door to swing 180 degrees
- C. Mortise Type Locks and Latches:
1. Tested and approved by BHMA for ANSI A156.13, Series 1000, Operational Grade 1, Extra-Heavy Duty, Security Grade 2 and be UL10C.
 2. Furnish UL or recognized independent laboratory certified mechanical operational testing to 4 million cycles minimum.
 3. Provide 9001-Quality Management and 14001-Environmental Management.
 4. Fit ANSI A115.1 door preparation
 5. Functions and design as indicated in the hardware groups
 6. Solid, one-piece, 3/4-inch (19mm) throw, anti-friction latchbolt made of self-lubricating stainless steel
 7. Deadbolt functions shall have 1 inch (25mm) throw bolt made of hardened stainless steel

8. Latchbolt and Deadbolt are to extend into the case a minimum of 3/8 inch (9.5mm) when fully extended
 9. Auxiliary deadlatch to be made of one-piece stainless steel, permanently lubricated
 10. Provide sufficient curved strike lip to protect door trim
 11. Lever handles must be of forged or cast brass, bronze or stainless-steel construction and conform to ANSI A117.1. Levers that contain a hollow cavity are not acceptable
 12. Lock shall have self-aligning, thru-bolted trim
 13. Levers to operate a roller bearing spindle hub mechanism
 14. Mortise cylinders of lock shall have a concealed internal setscrew for securing the cylinder to the lockset. The internal setscrew will be accessible only by removing the core, with the control key, from the cylinder body.
 15. Spindle to be designed to prevent forced entry from attacking of lever
 16. Provide locksets with 7-pin removable and interchangeable core cylinders
 17. Each lever to have independent spring mechanism controlling it
- D. Cylindrical Deadbolt:
1. Tested and approved by ANSI A156.36, Operational Grade 1,
 2. Fit modified ANSI A115.3 door preparation
 3. Provide 9001-Quality Management and 14001-Environmental Management.
 4. Locksets and cores to be of the same manufacturer to maintain complete lockset warranty
 5. 2-3/4 inch (70mm) backset, or 2-3/8 inch backset as needed
 6. 1-inch throw deadbolt
 7. Provide locksets with 7-pin core.
- E. Mortise Deadbolt:
1. Tested and approved by ANSI A156.36, Operational Grade 1.
 2. Provide 9001-Quality Management and 14001-Environmental Management.
 3. Locksets and cores to be of the same manufacturer to maintain complete lockset warranty
 4. 2-3/4 inch (70mm) backset
 5. 1 inch throw deadbolt
 6. Provide locksets with 7-pin core.
- F. Mortise Keypad Lock:
1. STD Mortise 1 1/4" (32 mm) face plate with auto deadbolt (non-handed)
 2. ANSI/BHMA Grade 1
 3. ASA 86 door preparation with three additional through-bore holes.
 4. 3/4" (19 mm) latch, 1" (25 mm) deadbolt
 5. 2-3/4" (70 mm) backset
 6. Indoor/Outdoor approved; -31 °F (-35 °C) to 151 °F (66 °C)
- G. Cylinders:
1. Provide the necessary cylinder housings, collars, rings & springs as recommended by the manufacturer for proper installation.
 2. Provide the proper cylinder cams or tail piece as required to operate all locksets and other keyed hardware items listed in the hardware sets.
 3. Coordinate and provide as required for related sections.
- H. Door Closers shall:
1. Tested and approved by BHMA for ANSI 156.4, Grade 1
 2. UL10C certified
 3. Provide 9001-Quality Management and 14001-Environmental Management.
 4. Closer shall have extra-duty arms and knuckles
 5. Conform to ANSI 117.1
 6. Maximum 2-7/16 inch case projection with non-ferrous cover
 7. Separate adjusting valves for closing and latching speed, and backcheck
 8. Provide adapter plates, shim spacers and blade stop spacers as required by frame and door conditions

9. Full rack and pinion type closer with 1-1/2 inch minimum bore
10. Mount closers on non-public side of door, unless otherwise noted in specification
11. Closers shall be non-handed, non-sized and multi-sized.

- I. Door Stops: Provide a dome floor or wall stop for every opening as listed in the hardware sets.
 1. Wall stop and floor stop shall be wrought bronze, brass, or stainless steel.
 2. Provide fastener suitable for wall construction.
 3. Coordinate reinforcement of walls where wall stop is specified.
 4. Provide dome stops where wall stops are not practical. Provide spacers or carpet riser for floor conditions encountered
- J. Pulls with plates: Provide with four beveled edges ANSI J301, 0.050 thickness Plates with ANSI J401 Pull as listed in hardware set. Provide proper fasteners for door construction.
- K. Push Pull Bars: Provide ANSI J504, 1" Dia. Pull and push bar model and series as listed in hardware set. Provide proper fasteners for door construction.
- L. Protection plates: Provide with four beveled edges ANSI J102, 10 inches high by width less 1 on pairs of doors or 2 inches on single doors. Furnish oval-head countersunk screws to match finish.
- M. Seals: All seals shall be finished to match adjacent frame color. Seals shall be furnished as listed in schedule. Material shall be UL listed for labeled openings.
- N. Weatherstripping: Provide at head and jambs only those units where resilient or flexible seal strip is easily replaceable. Where bar-type weatherstrip is used with parallel arm mounted closers install weatherstrip first.
 1. Weatherstrip shall be resilient seal of (Neoprene, Polyurethane, Vinyl, Pile, Nylon Brush, Silicone)
 2. UL10C Positive Pressure rated seal set when required.
- O. Door Bottoms/Sweeps: Surface mounted or concealed door bottom, where listed in the hardware sets.
 1. Door seal shall be resilient seal of (Neoprene, Polyurethane, Nylon Brush, Silicone)
 2. UL10C Positive Pressure rated seal set when required.
- P. Thresholds: Thresholds shall be aluminum beveled type with maximum height of 1/2" for conformance with ADA requirements. Furnish as specified and per details. Provide fasteners and screws suitable for floor conditions.

2.3 FINISH:

- A. Designations used in Schedule of Finish Hardware - 3.05, and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 including coordination with traditional U.S. finishes shown by certain manufacturers for their products.
- B. Powder coat door closers to match other hardware, unless otherwise noted.
- C. Aluminum items shall be finished to match predominant adjacent material. Seals to coordinate with frame color.

2.4 KEYS AND KEYING:

- A. Provide keyed brass construction cores and keys during the construction period. Construction control and operating keys and core shall not be part of the Owner's permanent keying system or furnished in the same keyway (or key section) as the Owner's permanent keying system. Permanent cores and keys (prepared according to the accepted keying schedule) will be furnished to the Owner.

- B. Cylinders, removable and interchangeable core system: Best CORMAX™ Patented 7-pin.
- C. Permanent keys and cores: Stamped with the applicable key mark for identification. These visual key control marks or codes will not include the actual key cuts. Permanent keys will also be stamped "Do Not Duplicate."
- D. Transmit Grand Master keys, Master keys and other Security keys to Owner by Registered Mail, return receipt requested.
- E. Furnish keys in the following quantities:
 - 1. 1 each Grand Master keys
 - 2. 4 each Master keys
 - 3. 2 each Change keys each keyed core
 - 4. 5 each Construction Master keys
 - 5. 1 each Control keys
- F. The Owner, or the Owner's agent, will install permanent cores and return the construction cores to the Hardware Supplier. Construction cores and keys remain the property of the Hardware Supplier.
- G. Keying Schedule: Arrange for a keying meeting, and programming meeting with Architect Owner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying and programming complies with project requirements. Furnish 3 typed copies of keying and programming schedule to Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of conditions: Examine doors, frames, related items and conditions under which Work is to be performed and identify conditions detrimental to proper and or timely completion.
 - 1. Do not proceed until unsatisfactory conditions have been corrected.

3.2 HARDWARE LOCATIONS:

- A. Mount hardware units at heights indicated in the following publications except as specifically indicated or required to comply with the governing regulations.
 - 1. Recommended Locations for Builders' Hardware for Standard Steel Doors and Frames, by the Door and Hardware Institute (DHI).
 - 2. Recommended locations for Architectural Hardware for flush wood doors (DHI).
 - 3. WDMA Industry Standard I.S.-1A-04, Industry Standard for Architectural wood flush doors.

3.3 INSTALLATION:

- A. Install each hardware item per manufacturer's instructions and recommendations. Do not install surface mounted items until finishes have been completed on the substrate. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- B. Conform to local governing agency security ordinance.
- C. Install Conforming to ICC/ANSI A117.1 Accessible and Usable Building and Facilities.
 - 1. Adjust door closer sweep periods so that from the open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the landing side of the door.
- D. Installed hardware using the manufacturers fasteners provided. Drill and tap all screw holes located in metallic materials. Do not use "Riv-Nuts" or similar products.

3.4 FIELD QUALITY CONTROL AND FINAL ADJUSTMENT

- A. Contractor/Installers, Field Services: After installation is complete, contractor shall inspect the completed door openings on site to verify installation of hardware is complete and properly adjusted, in accordance with both the Contract Documents and final shop drawings.
 - 1. Check and adjust closers to ensure proper operation.
 - 2. Check latch set, lockset, and exit devices are properly installed and adjusted to ensure proper operation.
 - a. Verify levers are free from binding.
 - b. Ensure latch bolts and dead bolts are engaged into strike and hardware is functioning.
 - 3. Report findings, in writing, to architect indicating that all hardware is installed and functioning properly. Include recommendations outlining corrective actions for improperly functioning hardware if required.

END SECTION 087100

SECTION 08 72 00 - WEATHERSTRIPPING & SEALS (THRESHOLDS)

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: [Commercial Thresholds] [And] [Ramp Thresholds].
- B. Related Sections:
 - 1. Division 8 Section(s): Steel Doors, Wood Doors, Sound Control Doors, Aluminum Frame Storefront Doors.
 - 2. Division 10 Section(s): Compartments and Cubicles, Partitions.
 - 3. Division 13 Section(s): Special Facilities, Integrated Construction, Special Structures, Special Purpose Rooms.

1.2 REFERENCES

- A. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI/BHMA):
 - 1. ANSI/BHMA A156.18: Materials and Finishes.
 - 2. ANSI/BHMA A156.21 Thresholds.
- B. Underwriters Laboratories, Inc. (UL):
 - 1. UL 10B Fire Tests of Door Assemblies.
 - 2. UL 10C Fire Tests of Door Assemblies.
 - 3. UL 410 Slip Resistance for Floor Surface Materials.
- C. Federal Government:
 - 1. U.S. Architectural & Transportation Barriers Compliance Board. Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG), 1992.
 - 2. Federal Standard FED-STD-795-1988 (Revised 1989) Uniform Federal Accessibility Standards.
 - 3. Federal Specification P-F-430C Finish, Floor, Water Emulsion (for Use On Light Colored Floors).
- D. International Code Council (ICC):
 - 1. UBC 7-2 Fire Test of Door Assemblies (Positive Pressure).
 - 2. International Building Code (IBC) Code 2000 (Positive Pressure).
 - 3. ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities.

1.3 SYSTEM DESCRIPTION

- A. Design Requirements: Provide threshold and seal products which have been manufactured, fabricated and installed to meet the following design criteria:
 - 1. Performance obtained from test procedures [UL 10B] [UL 10C] [ICC/ANSI A117.1].
 - 2. Compliant with UL 410.
 - 3. Compliant with ADA standards.

1.4 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal, Section 013000.
- B. Product Data: Submit manufacturer's product data and installation instructions.
- C. Shop Drawings: Provide drawings indicating required component locations, interface with adjacent materials, installation, anchorage, fastening and similar information.
- D. Samples: Submit one each of manufacturer's standard selection samples.
- E. Quality Assurance/Control Submittals: Submit the following:
 - 1. Test Reports: Upon request, submit [Fire] [Sound] [And] [Durability] test reports from recognized testing laboratory.
 - 2. Certificates: Submit manufacturer's certificate that products meet or exceed specified requirements.
- F. Closeout Submittals: Submit the following:
 - 1. Warranty documents specified herein.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size and complexity.

1.6 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Division 1 Product Requirement Section.
- B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at and at temperature and humidity conditions recommended by the manufacturer.

1.7 WARRANTY

- A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under contract documents.
 - 1. Warranty Period (Standard Products): 3 years against defects in materials or workmanship, beginning with Date of Substantial Completion.
 - 2. Warranty Period (PemKote Finish): 10 years against defects in materials or workmanship, beginning with Date of Substantial Completion.
 - 3. Warranty Period (Recycled Rubber Ramps): 5 years against defects in materials or workmanship, beginning with Date of Substantial Completion.

1.8 MAINTENANCE

- A. Extra Materials: Provide additional material for use by owner in building maintenance and repair. [Specify number of units or percentage].

PART 2 PRODUCTS

2.1 THRESHOLDS

- A. Manufacturer:
1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
 2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
- B. Proprietary Products/Systems: Thresholds, including the following:
1. Half Saddles/Offset Saddles:
 - a. Material: Extruded tempered aluminum 6063-T6.
 - b. Finish (ANSI/BHMA 156.18): [Mill finish aluminum].
 - c. Manufacturer Model Number:
 - 1) [Pemko 157 offset saddle threshold (3/4" to 1/4") for existing construction areas];
 - 2) [Pemko 158 Offset saddle threshold (1/2" to 1/4") for new work areas].
 2. Saddle/Offset Thresholds:
 - a. Material: Extruded tempered aluminum 6063-T6.
 - b. Finish (ANSI/BHMA 156.18): [Mill finish aluminum].
 - c. Manufacturer Model Number: [Specify manufacturer model number – TBD if required.].
 3. Elevator Thresholds:
 - a. Material: Extruded tempered aluminum 6063-T6.
 - b. Finish (ANSI/BHMA 156.18): [Mill finish aluminum].
 - c. Manufacturer Model Number: [Specify manufacturer model number – TBD if required.].
 4. Floor Plate Supports and Accessories:
 - a. Material: Extruded tempered aluminum 6063-T6.
 - b. Finish (ANSI/BHMA 156.18): [Mill finish aluminum].
 - c. Expansion Joint: Cork.
 - d. Width: [Specify width.].
 - e. Manufacturer Model Number: [Specify manufacturer model number – TBD if required.].
 5. Floor Plates and Safety Treads:
 - a. Material: Extruded tempered aluminum 6063-T6.
 - b. Finish (ANSI/BHMA 156.18): [Mill finish aluminum].
 - c. Width: [Specify width.].
 - d. Manufacturer Model Number: [Specify manufacturer model number – TBD if required.].
 6. Aluminum Plates:
 - a. Material: Extruded tempered aluminum 6063-T6.
 - b. Finish (ANSI/BHMA 156.18): [Mill finish aluminum].
 - c. Width: [Specify width.].
 - d. Manufacturer Model Number: [Specify manufacturer model number – TBD if required.].

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- A. Comply with the instructions and recommendations of the threshold manufacturer.

3.2 EXAMINATION

- A. Site Verification of Conditions:
 - 1. Verify that site conditions are acceptable for installation of thresholds.
 - a. Examine doors and frames for compliance with requirements for door and frame manufacturer's installation tolerances, labeled fire door assembly construction, wall and floor construction and other conditions affecting performance.
 - 2. Do not proceed with installation of thresholds until unacceptable conditions are corrected.

3.3 INSTALLATION

- A. Mounting Location: Comply with drawings and approved shop drawings.
- B. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
- C. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- D. Rubber Ramps: Install using "Liquid Nails" per manufacturer's installation instructions.

3.4 ADJUSTING

- A. Perform adjustments required to ensure that thresholds function in compliance with manufacturer's performance criteria prior to acceptance by Owner.

3.5 CLEANING

- A. Remove any protective films and clean components as necessary following manufacturer's recommended procedures.

3.6 PROTECTION

- A. Protect installed work from damage due to subsequent construction activity on the site.

END OF SECTION 08 72 00

SECTION 088000 - GLAZING

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Glass products.
2. Laminated glass.
3. Insulating glass.
4. Glazing sealants.
5. Miscellaneous glazing materials.

B. Related Requirements:

1. Section 084413 "Glazed Aluminum Curtain Walls."

1.2 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 in accordance with ASTM C1036.
- C. IBC: International Building Code.
- D. Interspace: Space between lites of an insulating-glass unit.

1.3 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances to achieve proper safety margins for glazing retention under each design load case, load case combination, and service condition.

1.4 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.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Sustainable Design Submittals:
 - 1. Product Data: For sealants, indicating VOC content.
 - 2. Laboratory Test Reports: For sealants, indicating compliance with requirements for low-emitting materials.
- C. Glass Samples: For each type of the following products; 12 inches (300 mm) square.
 - 1. Insulating glass.
- 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 qualified professional engineer responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer .
- B. Product Certificates: For glass.
- C. Product Test Reports: For fabricated glass, for tests performed by a qualified testing agency.
- D. Sample Warranties: For special warranties.

1.7 QUALITY ASSURANCE

- A. Fabricated-Glass Manufacturer Qualifications: A qualified manufacturer of fabricated glass units who is approved and certified by primary glass manufacturer.
- B. Installer Qualifications: A qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AG&M) contractors and who employs glazing technicians certified under the Architectural Glass and Metal Technician (AGMT) certification program.
- C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- D. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for materials and execution.

1. Install glazing in mockups specified in Section 084113 "Aluminum-Framed Entrances and Storefronts" and Section 084413 "Glazed Aluminum Curtain Walls" to match glazing systems required for Project, including glazing methods.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials in accordance with 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.

1.9 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 (4.4 deg C).

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 Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
 1. Warranty Period: Five years from date of Substantial Completion.

- C. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is obstruction of vision by dust, moisture, or film on interior surfaces of glass.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Glass: Obtain glass from single source from single manufacturer.
- B. Source Limitations for Glazing Accessories: For each product and installation method, obtain from single source from single manufacturer.

2.2 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 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 Section 014000 "Quality Requirements," to design glazing.
- C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined in accordance with the IBC and ASTM E1300:
 - 1. Design Wind Pressures: Determine design wind pressures applicable to Project in accordance with ASCE/SEI 7, based on heights above grade indicated on Drawings.
 - a. Wind Design Data: As indicated on Drawings.
 - b. Basic Wind Speed: As indicated on 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 (25 mm), whichever is less.
 - 3. Thermal Loads: Design glazing to resist thermal stress breakage induced by differential temperature conditions and limited air circulation within individual glass lites and insulated glazing units.
- D. Windborne-Debris-Impact Resistance: Exterior glazing shall pass ASTM E1886 missile-impact and cyclic-pressure tests in accordance with ASTM E1996 for Wind Zone 4 for enhanced protection.

1. Large-Missile Test: For all glazing, regardless of height above grade.
- E. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- F. 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 laminated-glass lites, properties are based on products of construction indicated.
 3. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
 4. U-Factors: Center-of-glazing values, in accordance with NFRC 100 and based on most current non-beta version of LBL's WINDOW computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
 5. SHGC and Visible Transmittance: Center-of-glazing values, in accordance with NFRC 200 and based on most current non-beta version of LBL's WINDOW computer program.
 6. Visible Reflectance: Center-of-glazing values, in accordance with NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

- A. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- B. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the IGCC.
- C. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than thickness indicated.
 1. Minimum Glass Thickness for Exterior Lites: 6 mm.
- D. Strength: 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. 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. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

- A. Clear Annealed Float Glass: ASTM C1036, Type I, Class 1 (clear), Quality-Q3.
- B. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), 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.
- C. Heat-Strengthened Float Glass: ASTM C1048, 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. Reflective- and Low-E-Coated Vision Glass: ASTM C1376.

2.5 LAMINATED GLASS

- A. Laminated Glass: ASTM C1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
1. Construction: Laminate glass with polyvinyl butyral interlayer or cast-in-place and cured-transparent-resin interlayer to comply with interlayer manufacturer's written instructions.
 2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
 3. Interlayer Color: Clear unless otherwise indicated.

2.6 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified in accordance with ASTM E2190.
1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
 2. Perimeter Spacer: Manufacturer's standard spacer material and construction .
 3. Desiccant: Molecular sieve or silica gel, or a blend of both.

2.7 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. Sealant shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
4. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range of industry colors.

B. Neutral-Curing Silicone Glazing Sealant, Class 50: Complying with ASTM C920, Type S, Grade NS, Use NT.

1. Applications: Glazing in frames without gaskets.

2.8 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by 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:

1. Type recommended in writing by sealant or glass manufacturer.

D. Spacers:

1. Type recommended in writing by sealant or glass manufacturer.

E. Edge Blocks:

1. Type recommended in writing by sealant or glass manufacturer.

F. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.9 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 (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.

PART 3 - EXECUTION

3.1 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.

3.2 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.

3.3 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 (1270 mm).
 - 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- (3-mm-) 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 in accordance with 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 in writing by gasket manufacturer.
- 3.4 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 in writing 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 in writing by gasket manufacturer.

- E. Install gaskets so they protrude past face of glazing stops.

3.5 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.6 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 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.

3.7 MONOLITHIC GLASS SCHEDULE

- A. Clear Glass Type: Heat-strengthened or Fully tempered float glass.
 - 1. Minimum Thickness: 6 mm.
 - 2. Safety glazing required.

3.8 LAMINATED GLASS SCHEDULE

- A. Laminated Tinted Glass Type: Two plies of heat-strengthened or fully tempered float glass with outer ply tinted and inner ply clear.
 - 1. Tint Color: Match tint and appearance of insulating glass lites.

2. Minimum Thickness of Each Glass Ply: 6 mm .
3. Interlayer Thickness: 0.060 inch (1.52 mm).
4. Overall Unit Thickness: 9/16 inch.
5. Safety glazing required.

3.9 INSULATING-LAMINATED-GLASS SCHEDULE

A. Tinted, Insulating Laminated Glass Type:

1. Overall Unit Thickness: 1-5/16 inch (30 mm) .
2. Minimum Thickness of Outdoor Lite: 6 mm.
3. Outdoor Lite: Tinted heat-strengthened or fully tempered float glass.
4. Tint Color: see drawings for tinting.
5. Interspace Content: Air.
6. Indoor Lite: Clear laminated glass with two plies of heat-strengthened or fully tempered float glass.
 - a. Minimum Thickness of Each Glass Ply: 6 mm.
 - b. Interlayer Thickness: 0.060 inch (1.52 mm).
7. Center of Glass U-Value: 0.29 maximum.
8. Assembly U-Value: 0.46 maximum.
9. Shading Coefficient: 0.20.
10. Visible Light Transmittance: 23 percent minimum.
11. SGHC: 0.20 maximum.
12. Exterior Reflectance: 6 percent.
13. Safety glazing required.

END OF SECTION08 80 00

SECTION 088300 - MIRRORS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following types of silvered flat glass mirrors.
 - 1. Annealed monolithic glass mirrors.

1.2 DEFINITIONS

- A. Deterioration of Mirrors: Defects developed from normal use that are attributable to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning mirrors contrary to mirror manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide mirrors that will not fail under normal usage. Failure includes glass breakage and deterioration attributable to defective manufacture, fabrication, and installation.

1.4 SUBMITTALS

- A. Product Data: For the following:
 - 1. Mirrors. Include description of materials and process used to produce each type of silvered flat glass mirror specified that indicates sources of glass, glass coating components, edge sealer, and quality-control provisions.
 - 2. Mirror hardware.
- B. LEED Submittal:
 - 1. Product Data for Credit EQ 4.1: For adhesives, including printed statement of VOC content.
- C. Shop Drawings: Include mirror elevations, edge details, mirror hardware, and attachments to other work.
- D. Product Certificates: For each type of mirror, signed by product manufacturer.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed mirror glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in mirror installations with a record of successful in-service performance.
- B. Source Limitations for Mirrors: Obtain mirrors from one source for each type of mirror indicated.
- C. Source Limitations for Mirror Glazing Accessories: Obtain mirror glazing accessories from one source for each type of accessory indicated.
- D. Glazing Publications: Comply with the following published recommendations:
 - 1. GANA's "Glazing Manual" unless more stringent requirements are indicated. Refer to this publication for definitions of glass and glazing terms not otherwise defined in this Section or in referenced standards.
 - 2. GANA Mirror Division's "Mirrors, Handle with Extreme Care: Tips for the Professional on the Care and Handling of Mirrors."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect mirrors according to mirror manufacturer's written instructions and as needed to prevent damage to mirrors from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with mirror manufacturer's written instructions for shipping, storing, and handling mirrors as needed to prevent deterioration of silvering, damage to edges, and abrasion of glass surfaces and applied coatings. Store indoors, protected from moisture including condensation.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form, made out to Owner and signed by mirror manufacturer agreeing to replace mirrors that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below:
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SILVERED FLAT GLASS MIRROR MATERIALS

- A. Clear Glass Mirrors: ASTM C 1503, Mirror Select Quality.

1. Nominal Thickness: 6.0 mm.

2.2 MISCELLANEOUS MATERIALS

- A. Edge Sealer: Coating compatible with glass coating and approved by mirror manufacturer for use in protecting against silver deterioration at mirrored glass edges.
- B. Mirror Mastic: An adhesive setting compound, produced specifically for setting mirrors and certified by both mirror manufacturer and mastic manufacturer as compatible with glass coating and substrates on which mirrors will be installed.
 1. VOC Content: Not more than 70 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.3 FABRICATION

- A. Mirror Sizes: To suit Project conditions, cut mirrors to final sizes and shapes.
- B. Mirror Edge Treatment: Flat polished edge with continuous stainless steel or aluminum frame.
 1. Seal edges of mirrors after edge treatment to prevent chemical or atmospheric penetration of glass coating.
 2. Require mirror manufacturer to perform edge treatment and sealing in factory immediately after cutting to final sizes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, over which mirrors are to be mounted, with Installer present, for compliance with installation tolerances, substrate preparation, and other conditions affecting performance.
 1. Proceed with mirror installation only after unsatisfactory conditions have been corrected and surfaces are dry.

3.2 INSTALLATION

- A. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.
- B. Provide a minimum air space of 1/8 inch between back of mirrors and mounting surface for air circulation between back of mirrors and face of mounting surface.

- C. For wall-mounted mirrors, install mirrors with mirror hardware.
 - 1. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors.

3.3 CLEANING AND PROTECTION

- A. Protect mirrors from breakage and contaminating substances resulting from construction operations.
- B. Do not permit edges of mirrors to be exposed to standing water.
- C. Maintain environmental conditions that will prevent mirrors from being exposed to moisture from condensation or other sources for continuous periods of time.

END OF SECTION 088300

SECTION 089000 - LOUVERS AND VENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Fixed, extruded-aluminum louvers and insect screens.

1.3 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. Horizontal Louver: Louver with horizontal blades; i.e., the axis of the blades are horizontal.
- C. Storm-Resistant Louver: Louver that provides specified wind-driven rain performance, as determined by testing according to AMCA 500-L.

1.4 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 structural failure of louver components, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act normal to the face of the building.
 - 1. Wind Loads: Louvers shall structurally perform to the windloads described on the structural drawings and the Large Missile Impact Requirements of the 2018 IBC, **Section 1603.1.4, Wind design data**, and ASCE 7-16.
- 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.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 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.
 - 2. Show mullion profiles and locations.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification: For type of metal finish required.
- E. Delegated-Design Submittal: For louvers indicated to comply with structural performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed according to AMCA 500-L by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver and showing compliance with performance requirements specified.

1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain louvers and vents from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.
- B. Welding: Qualify procedures and personnel according to the following:
 - 1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
- C. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5, T-52, or T6.
- B. Aluminum Sheet: ASTM B 209, Alloy 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.
- C. Aluminum Castings: ASTM B 26/B 26M, Alloy 319.
- D. Fasteners: Use sizes to suit unit installation conditions.

1. For all fastening, use 300 series stainless-steel fasteners.
 2. For color-finished louvers, use fasteners with heads that match color of louvers.
- E. Post installed Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, made from stainless-steel components, with capability to sustain, without failure, a load equal to 4 times the loads imposed, for concrete, or 6 times the load imposed, for masonry, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
- F. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.2 FABRICATION, GENERAL

- A. Assemble louvers in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. 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. Join frame members to each other and to fixed louver blades with welds concealed from view, threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.3 FIXED, EXTRUDED-ALUMINUM LOUVERS

- A. Horizontal Storm-Resistant Louver:
1. Basis-of-Design Product: Subject to compliance with requirements, provide product by C/S Louvers, RS-8615 (Construction Specialties, Inc.), or comparable product by one of the following:
 - a. Air Balance Inc.; a Mestek company.
 - b. Air Flow Company, Inc.
 - c. Airolite Company, LLC (The).
 - d. All-Lite Architectural Products.
 - e. Arrow United Industries; a division of Mestek, Inc.
 - f. Greenheck Fan Corporation.
 - g. Industrial Louvers, Inc.
 - h. Reliable Products, Inc.
 - i. Ruskin Company; Tomkins PLC.
 2. Louver Depth: 8 inches.

3. Frame and Blade Nominal Thickness: Not less than 0.080 inch for blades and 0.080 inch for frames.
4. Louver Performance Ratings:
 - a. Free Area: Not less than 5.0 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 exhaust or intake velocity.
 - c. Wind-Driven Rain Performance: Not less than 80 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 300 fpm.
5. Blade Profile: per manufacturer.
6. Blade Spacing: per manufacturer.

2.4 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

2.5 ALUMINUM FINISHES

- A. High-Performance Organic Finish: 4-coat fluoropolymer finish complying with AAMA 2605 and 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.
 1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 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.

3.3 INSTALLATION

- A. Locate and place louvers and vents level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. 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. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.
- F. Protect unpainted galvanized and nonferrous-metal surfaces that will be 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.
- G. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Division 7 Section "Joint Sealants" for sealants applied during louver installation.

3.4 ADJUSTING AND CLEANING

- A. Test operation of adjustable louvers and adjust as needed to produce fully functioning units that comply with requirements.

- B. Clean exposed surfaces of louvers and vents that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.
- C. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- D. Restore louvers and vents damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.
 - 1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 08 90 00

DIVISION 09 FINISHES

SECTION 09 26 00 - GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Interior metal stud wall framing.
 2. Metal channel ceiling framing.
 3. Shaft wall system.
 4. Gypsum board and joint treatment.
 5. Exterior sheathing.
 6. Tile backer board.
 7. Acoustic insulation.
 8. Textured finishes.
- B. Related Requirements:
1. Section 054000 - Cold-Formed Metal Framing: Exterior wall & soffit framing.
 2. Section 061000 - Rough Carpentry: Wood framing and blocking for support of.
 3. Section 072100 - Batt Insulation: Thermal insulation.

1.2 REFERENCE STANDARDS

- A. ASTM International:
1. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 2. ASTM C514 - Standard Specification for Nails for the Application of Gypsum Board.
 3. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
 4. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members.
 5. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 6. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
 7. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board.
 8. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
 9. ASTM C1002 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases.
 10. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.
 11. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel.
 12. ASTM C1280 - Standard Specification for Application of Gypsum Sheathing.
 13. ASTM C1288 - Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets.
 14. ASTM C1325 - Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cement Substrate Sheets.
 15. ASTM C1396/C1396M - Standard Specification for Gypsum Board.
 16. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

17. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 18. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
 19. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- B. American Society of Civil Engineers:
1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- C. California Department of Health Services:
1. CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.
- D. Gypsum Association:
1. GA 214 - Recommended Levels of Gypsum Board Finish.
 2. GA 216 - Application and Finishing of Gypsum Board.
 3. GA 600 - Fire Resistance Design Manual Sound Control.
- E. Intertek Testing Services (Warnock Hersey Listed):
1. WH - Certification Listings.
- F. National Fire Protection Association:
1. NFPA 265 - Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Coverings on Full Height Panels and Walls, Method B.
 2. NFPA 286 - Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Wall and Ceiling Interior Finish.
- G. South Coast Air Quality Management District:
1. SCAQMD Rule 1168-January 7, 2005 - Adhesive and Sealant Applications.
- H. Underwriters Laboratories Inc.:
1. UL - Fire Resistance Directory.
- 1.3 PRE-INSTALLATION MEETINGS
- A. Section 013000 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.
- 1.4 SUBMITTALS
- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit data on metal framing, gypsum board, joint tape; and acoustic accessories.
- C. Shop Drawings:
1. Indicate special details associated with fireproofing, and acoustic seals.
 2. Indicate installation details required for seismic design loads.
- 1.5 QUALITY ASSURANCE
- A. Perform Work in accordance with ASTM C840, ASTM C1280, GA-214, GA-216 and GA-600.

- B. Fire Rated Wall Construction: Rating as indicated on Drawings in conjunction with Sections 054000 “Cold Formed Metal Framing” and 061050 “Rough Carpentry”, respectively.
 - 1. Tested Rating: Determined in accordance with ASTM E119.
 - 2. Fire Rated Partitions: Listed assembly by UL (see drawings for UL nos.).

- C. Surface Burning Characteristics:
 - 1. Textile Wall Coverings: Comply with one of the following:
 - a. Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.
 - b. Requirements of applicable code when tested in accordance with NFPA 265 Method B test protocol.
 - c. Requirements of applicable code when tested in accordance with NFPA 286.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with documented experience.

- B. Installer: Company specializing in performing Work of this section with documented experience.

PART 2 PRODUCTS

2.1 GYPSUM BOARD ASSEMBLIES

- A. Manufacturers: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Gold Bond.
 - 2. United States Gypsum.
 - 3. Georgia Pacific.
 - 4. Substitutions: Section 016000 - Product Requirements.

2.2 COMPONENTS

- A. Framing Materials
 - 1. Studs.
 - 2. Furring, Framing, and Accessories: ASTM C645, GA-216 and GA-600.
 - 3. Fasteners: ASTM C1002, GA-216; length to suit application.
 - 4. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.
 - 5. Adhesive: ASTM C557.

- B. Gypsum Board Materials: ASTM C1396/C1396M; Type X fire resistant.
 - 1. Fire Rated Gypsum Board: ASTM C1396; fire resistive type, UL rated:
 - a. 5/8-inch-thick
 - b. maximum available length in place
 - c. ends tapered
 - 2. Fire Rated Mold and Moisture Resistant Gypsum Board: ASTM C36; fire resistive type, UL rated:
 - a. 5/8-inch-thick
 - b. maximum available length in place
 - c. ends tapered
 - d. Products:

- 1) USG: 5/8" Mold Tough Firecorde C
 - 2) Certainteed: 5/8" ProRoc Mold and Moisture Resistant Type X.
 - 3) National Gypsum: 5/8" XP, Fire-Shield C
 3. Exterior Sheathing Board: ASTM C1396
 - a. 5/8" thick.
 - b. Products:
 - 1) a. USG, Securock.
 - 2) b. Georgia Pacific DensGlas.
 4. Shaftwall: ASTM C1396, type SLX, ASTM C1396, type X face boards
 - a. 1" thick
 5. Hi-Impact Gypsum Board:
 - a. 5/8-inch-thick
 - b. Products:
 - 1) National Gypsum Gold Bond Hi-Impact XP Gypsum Board
 - 2) USG, Fiberock VHI
- C. Tile Backer Boards:
1. Glass Mat Gypsum Tile Backer Board: ASTM C1178/C1178M
 - a. 5/8-inch-thick
 - b. Type X fire resistant
 - c. maximum available length in place
 - d. ends tapered
 - e. mold resistant.
 2. Fiber Cement Tile Backer Board: ASTM C1288
 - a. 5/8-inch-thick
 - b. mold resistant.
 3. Tile Backer Board Joint Tape: 2-inch-wide, coated glass fiber tape for joints and corners.
- ### 2.3 ACCESSORIES
- A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, un-faced, 6 inches thick.
 - B. Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board.
 - C. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
 - D. Gypsum Board Accessories: ASTM C1047; metal; corner beads, edge trim, and expansion joints.
 1. Metal Accessories: Zinc.
 2. Edge Trim: Type L bead.
 - E. Joint Materials: GA-216; reinforcing tape, joint compound, and water.
 1. For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
 2. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 3. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
 4. Fill Coat: For second coat, use drying-type, all-purpose compound.
 5. Finish Coat: For third coat, use drying-type, all-purpose compound.
 6. Joint Tape:
 - a. Interior Gypsum Board: Paper.

- b. Tile Backing Panels: As recommended by panel manufacturer
- 7. Joint Compound for Tile Backing Panels:
 - a. Glass-Mat, Water-Resistant Backing Panel as recommended by backing panel manufacturer.
- F. Textured Finish Materials: Latex based texturing material.
- G. Gypsum Board Screws: ASTM C954, ASTM C1002; length to suit application.
 - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
- H. Gypsum Board Nails: ASTM C514 or ASTM F1667; blued steel wire, deformed shank; length to suit application.
- I. Plate Blocking: 14-gauge steel.
- J. Exterior Sheathing Tape: 2" wide 10 x 10 woven thread per inch, self-adhering fiberglass joint tape.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Sections 017300 and 017700 – “Execution” and “Closeout Procedures”: Requirements for installation examination.
- B. Verify site conditions are ready to receive work and opening dimensions are as indicated on shop drawings.

3.2 INSTALLATION

- A. Stud Installation:
 - 1. Install acoustical sealant under floor track of all studs.
 - 2. Stud Spacing: refer to drawings.
 - 3. Refer to Drawings for indication of partitions extending stud framing through ceiling to structure above. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide extended leg ceiling runners.
 - 4. Door Opening Framing: Install double studs at doorframe jambs.
 - 5. Blocking: Nail wood blocking to studs. Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, wood frame opening, toilet accessories, hardware, and other accessories.
 - 6. Install bridging at 1/3 points.
- B. Wall Furring Installation:
 - 1. Erect wall furring for direct attachment to walls.
 - 2. Erect furring channels horizontally; space maximum 16 inches oc, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
 - 3. Erect metal stud framing tight to concrete masonry walls, attached by adjustable furring brackets.
- C. Furring For Fire Ratings: Install furring as required for fire resistance ratings indicated.

- D. Ceiling Framing Installation:
1. Install ceiling framing independent of walls, columns, and above ceiling work.
 2. Reinforce openings in ceiling suspension system which interrupt main carrying channels or furring channels, with lateral channel bracing. Extend bracing minimum 24 inches past each end of openings.
 3. Laterally brace entire suspension system.
 4. Install 1-1/2" metal channels at max. 48" o.c. and 7/8" furring channels at 16" o.c.
- E. Acoustic Accessories Installation:
1. Place acoustic insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.
 2. Install acoustic sealant at gypsum board perimeter at:
 - a. Metal Framing: One bead.
 - b. Seal penetrations of partitions by conduit, pipe, ductwork, and rough-in boxes.
- F. Gypsum Board Installation:
1. Install gypsum board in accordance with GA-216 and GA-600.
 2. Erect single layer gypsum board in most economical direction, with ends and edges occurring over firm bearing.
 3. Erect single layer fire rated gypsum board vertically, with edges and ends occurring over firm bearing.
 4. Erect exterior gypsum sheathing in accordance with ASTM C1280 and manufacturer's recommendations, horizontally, with edges butted and ends occurring over firm bearing.
 5. Use screws when fastening gypsum board to metal furring or framing.
 6. Tape all joints on exterior gypsum sheathing with 2" wide 10 x 10 woven threads per inch, self-adhering fiberglass joint tape.
 7. Double Layer Applications: Secure second layer to first with fasteners.
 8. Place second layer perpendicular to first layer. Offset joints of second layer from joints of first layer.
 9. Treat cut edges and holes in moisture resistant gypsum board and exterior gypsum sheathing with sealant.
 10. Place control joints consistent with lines of building spaces as indicated on Drawings.
 11. Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.
 12. Install reveals moldings at locations indicated on Drawings.
 13. All rated and smoke walls shall be stenciled above the ceiling with the rating of the wall.
 14. Install control joints at maximum 30' o.c. Location by Architect.
- G. Joint Treatment:
1. Finish in accordance with GA-214 Level 4.
 2. Fill and finish joints and corners of cementitious backing board.
- H. Texture Finish: Light Texture.
- I. Shaft Wall Installation:
1. Install vertically between steel runners attached to floor and ceiling. Insert panel edges into specially form studs spaced 24" o.c. Finish one side in accordance with Finish Schedule. Install materials as required for one- or two-hour rating as shown on plans.
- J. Exterior Sheathing Installation:
1. Apply sheathing perpendicular or parallel to framing with smooth side towards exterior. Fit ends closely.

- 2. Install fasteners in accordance with manufacturer's recommendations.
- 3. Caulk all joints.
- 4. Tape all joints with 2" wide fiberglass tape.

3.3 ERECTION TOLERANCES

- A. Section 0173000 - Quality Assurance: Tolerances.
- B. Maximum Variation of Finished Gypsum Board Surface from Flat Surface: 1/8 inch in 10 feet.

3.4 SCHEDULES

A. Material:

<u>Location</u>	<u>Type</u>
1. Toilet Rooms and Kitchens Janitor Closets, Mechanical Rooms	Mold Resistant Gypsum Bd.
2. Ceilings and Furr Downs	Fire-Rated Gypsum Board
3. Walls	Fire-Rated Gypsum Board
4. Tile Walls	Cement Backer Board Substrate

B. Finishes:

- 1. Gypsum Board Walls and Ceilings: GA. 214 Level 4

C. Acoustic Insulation:

- 1. Install acoustical sealant under all interior stud tracks that have acoustical insulation.
- 2. Insulate walls, full thickness as indicated on Drawings.
- 3. Ceilings, 6" thick as indicated on Drawings.

D. Access Panels:

- 1. Install in gypsum board ceilings at all HVAC box units and at each floor of all fire rated shafts final location to be determined by Architect.

END OF SECTION 09 26 00

SECTION 09 51 23 - ACOUSTICAL TILE CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Section Includes:

1. Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

1.2 SUMMARY

A. Section Includes

1. Acoustical ceiling panels
2. Exposed grid suspension system
3. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings
4. Perimeter Trim

B. Related Sections:

1. Section 09 51 33.13 Acoustical Snap In Metal Pan Ceiling
2. Section 09 20 00 (09250) - Plaster and Gypsum Board
3. Section 09 51 13 (09500) - Acoustical Fabric-Faced Panel Ceilings
4. Section 09 53 00 (09500) - Acoustical Ceiling Suspension Assemblies
5. Section 01 81 13 - Sustainable Design Requirements
6. Section 01 81 19 - Indoor Air Quality Requirements
7. Section 09 54 00 Specialty Ceilings
8. Divisions 23 - HVAC Air Distribution
9. Division 26 - Electrical

C. Alternates

1. Prior Approval: Unless otherwise provided for in the Contract documents, proposed product substitutions may be submitted no later than TEN (10) working days prior to the date established for receipt of bids. Acceptability of a proposed substitution is contingent upon the Architect's review of the proposal for acceptability and approved products will be set forth by the Addenda. If included in a Bid are substitute products that have not been approved by Addenda, the specified products shall be provided without additional compensation.
2. Submittals that do not provide adequate data for the product evaluation will not be considered. The proposed substitution must meet all requirements of this section, including but not necessarily limited to, the following: Single source materials suppliers (if specified in Section 1.5); Underwriters' Laboratories Classified Acoustical performance; Panel design, size, composition, color, and finish; Suspension system component profiles and sizes; Compliance with the referenced standards.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
2. ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
3. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
4. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
5. ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
6. ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels
7. ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
8. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials
9. ASTM E 1111 Standard Test Method for Measuring the Interzone Attenuation of Ceilings Systems
10. ASTM E 1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
11. ASTM E 1264 Classification for Acoustical Ceiling Products

B. International Building Code

1. ASHRAE Standard 62.1-2004 Ventilation for Acceptable Indoor Air Quality
2. NFPA 70 National Electrical Code
3. ASCE 7 American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures
4. ESR 1308 - Armstrong Suspension Systems

1.4 SYSTEM DESCRIPTION

A. Continuous/Wall-to-Wall

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.
- B. Samples: Minimum 6 inch x 6 inch samples of specified acoustical panel; 8 inch long samples of exposed wall molding and suspension system, including main runner and 4 foot cross tees.
- C. Shop Drawings: Layout and details of acoustical ceilings show locations of items that are to be coordinated with or supported by the ceilings.

- D. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC, CAC, and AC.
- E. If the material supplied by the acoustical subcontractor does not have an Underwriter's Laboratory classification of acoustical performance on every carton, subcontractor shall be required to send material from every production run appearing on the job to an independent or NVLAP approved laboratory for testing, at the architect's or owner's discretion. All products not conforming to manufacturer's current published values must be removed, disposed of and replaced with complying product at the expense of the Contractor performing the work.

1.6 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.
- B. Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
 - 1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 Classification.
- C. Acoustic Panels: As with other architectural features located at the ceiling, may obstruct or skew the planned fire sprinkler water distribution pattern through possibly delay or accelerate the activation of the sprinkler or fire detection systems by channeling heat from a fire either toward or away from the device. Designers and installers are advised to consult a fire protection engineer, NFPA 13, or their local codes for guidance where automatic fire detection and suppression systems are present.
- D. Coordination of Work: Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.8 PROJECT CONDITIONS

- A. Space Enclosure:
 - 1. Standard Ceilings: Do not install interior ceilings until space is enclosed and weatherproof; wet work in place is completed and nominally dry; work above ceilings is complete; and ambient conditions of temperature and humidity are continuously maintained at values

near those intended for final occupancy. Building areas to receive ceilings shall be free of construction dust and debris.

2. HumiGuard Plus Ceilings: Building areas to receive ceilings shall be free of construction dust and debris. Products with HumiGuard Plus performance and hot dipped galvanized steel, aluminum or stainless-steel suspension systems can be installed up to 120°F (49°C) and in spaces before the building is enclosed, where HVAC systems are cycled or not operating. Cannot be used in exterior applications where standing water is present or where moisture will come in direct contact with the ceiling.
3. HumiGuard Max Ceilings: Building areas to receive ceilings shall be free of construction dust and debris. Ceilings with HumiGuard Max performance can be installed in conditions up to 120°F (49°C) and maximum humidity exposure including outdoor applications, and other standing water applications, so long as they are installed with either SS Prelude Plus, AL Prelude Plus, or Prelude Plus Fire Guard XL suspension systems. Products with Humiguard Max performance can be installed in exterior applications, where standing water is present, or where moisture will come in direct contact with the ceiling. Only Ceramaguard with AL Prelude Plus suspension system can be installed over swimming pools.

1.9 WARRANTY

- A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period. Failures include, but are not limited to the following:
 1. Acoustical Panels: Sagging and warping
 2. Grid System: Rusting and manufacturer's defects
- B. Warranty Period:
 1. Acoustical Metal panels: One (1) year from date of substantial completion
 2. Grid: Ten (10) years from date of substantial completion
- C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

1.10 MAINTENANCE

- A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.
 1. Acoustical Metal Ceiling Units: Furnish quality of full-size units equal to 5.0 percent of amount installed.
 2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Metal Ceiling Panels:

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

B. Suspension Systems:

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

2.2 ACOUSTICAL CEILING UNITS

A. Acoustical Panels Type AP

1. Surface Texture: Smooth
2. Composition: Mineral Fiber
3. Color: White
4. Size: 24 in x 24 in
5. Edge Profile: Square Lay-In 15/16 in for interface with PRELUDE XL 15/16" Exposed Tee grid.
6. Noise Reduction Coefficient (NRC):
7. Ceiling Attenuation Class (CAC): ASTM C 1414; Classified with UL label on product carton 33
8. Articulation Class (AC):
9. Flame Spread: ASTM E 1264; Class A (UL)
10. Light Reflectance (LR) White Panel: ASTM E 1477; 0.89
11. Dimensional Stability: HumiGuard Plus
12. Recycle Content: Post-Consumer - 0% Pre-Consumer - 36%
13. Acceptable Product: See finish schedule

2.3 METAL SUSPENSION SYSTEMS

A. Components:

1. Main beams and cross tees, base metal and end detail, fabricated from commercial quality hot dipped galvanized steel complying with ASTM A 653. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping prefinished galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching.
 - a. Structural Classification: ASTM C 635 Intermediate Duty duty

- b. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.
 - c. Recycle Content: Post-Consumer - 23% Pre-Consumer - 7%
 - d. Acceptable Product: PRELUDE XL 15/16" Exposed Tee as manufactured by Armstrong World Industries
- B. Attachment Devices:
- 1. Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- C. Wire for Hangers and Ties:
- 1. ASTM A 641, Class 1 zinc coating, soft annealed, with a yield stress load of at least three times design load, but not less than 12 gauge.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations. (Exception: HumiGuard Max Ceilings)

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.
- B. Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.

3.3 INSTALLATION

- A. Follow manufacturer installation instructions:
 - 1. Install suspension system and panels in accordance with the manufacturer's instructions, and in compliance with ASTM C 636 and with the authorities having jurisdiction.
 - 2. Install wall moldings at intersection of suspended ceiling and vertical surfaces. Miter corners where wall moldings intersect or install corner caps.
 - 3. For reveal edge panels: Cut and reveal or rabbet edges of ceiling panels at border areas and vertical surfaces.
 - 4. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.
 - 5. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.

3.4 ADJUSTING AND CLEANING

- A. Replace damaged and broken panels.
- B. Clean exposed surfaces of ceilings panels, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 51 23

SECTION 09650 - RESILIENT FLOORING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Luxury vinyl tile
 - 2. Sheet Vinyl Flooring.
 - 3. Rubber Base.
 - 4. Self Cove Base.
- B. Related Sections:
 - 1. Section 03300 – Cast-In-Place Concrete: Substrate.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile.
 - 2. ASTM F1303 - Standard Specification for Sheet Vinyl Floor Covering with Backing.
 - 3. ASTM F1344 - Standard Specification for Rubber Floor Tile.
 - 4. ASTM F1861 - Standard Specification for Resilient Wall Base.
- B. California Department of Health Services:
 - 1. CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.
- C. Federal Specification Unit:
 - 1. FS L-F-475 - Floor Covering Vinyl, Surface (Tile and Roll), with Backing.
 - 2. FS RR-T-650 - Treads, Metallic and Nonmetallic, Skid Resistant.
- D. National Fire Protection Association:
 - 1. NFPA 253 - Standard Method of Test for Critical Radiant Flux for Floor Covering Systems Using a Radiant Heat Energy Source.
- E. Scientific Certification Systems:
 - 1. SCS EC10.2 - Environmental Certification Program Indoor Air Quality Performance.
- F. South Coast Air Quality Management District:
 - 1. SCAQMD Rule 1113-January 1, 2004 - Architectural Coatings.
 - 2. SCAQMD Rule 1168-January 7, 2005 - Adhesive and Sealant Applications.

1.3 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate seaming plan, custom patterns and inlay designs.
- C. Product Data: Submit data describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- D. Samples:

1. Submit manufacturer's complete set of color samples for initial selection.
2. Submit two samples, 4 x 4 inch in size illustrating color and pattern for each resilient flooring product specified.

1.4 CLOSEOUT SUBMITTALS

- A. Section 01700 - Execution and Closeout Requirements: Closeout procedures.
- B. Operation and Maintenance Data: Submit maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.5 QUALITY ASSURANCE

- A. Surface Burning Characteristics:
 1. Floor Finishes: Class I, minimum 0.45 watts/sq cm when tested in accordance with NFPA 253.
 2. Base Material: Class I, minimum 0.45 watts/sq cm when tested in accordance with NFPA 253.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with documented experience.
- B. Installer: Company specializing in performing Work of this section with documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 01600 - Product Requirements: Product storage and handling requirements.
- B. Protect roll materials from damage.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Section 01600 - Product Requirements.
- B. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- C. Store materials for not less than 48 hours prior to installation in area of installation at temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

1.9 EXTRA MATERIALS

- A. Section 01700 - Execution and Closeout Requirements: Spare parts and maintenance products.
- B. Furnish 100 sq ft of flooring, 2 lineal feet of base, of each type and color specified.

PART 2 PRODUCTS

2.1 FLOORING

- A. See Finish Schedule.

2.2 ACCESSORIES

- A. Subfloor Filler: Premix latex; type recommended by adhesive material manufacturer.
- B. Primers and Adhesives: Epoxy Waterproof; types recommended by flooring manufacturer, zero VOC.
- C. Moldings and Edge Strips: Same material as flooring; manufactured by.
- D. Sheet Flooring Vinyl Welding Rod: Solid vinyl bead produced by manufacturer of vinyl flooring for heat welding seams, in color matching field color.
- E. Feature Strips: Of same material as flooring.
- F. Filler for Coved Base: Plastic.
- G. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01300 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Perform Calcium Chloride Test in accordance with ASTM F1869 and Relative Humidity Test (RH test) in accordance with ASTM F-2170. If tests indicate vapor mitigation is required, install vapor barrier per Section 09 96 66 Water Vapor Emission Control Systems. If vapor mitigation is not required, the Contractor shall credit the Owner \$3.00/s.f. for the cost of the vapor mitigation barrier.
- C. Verify floor and lower wall surfaces are free of substances capable of impairing adhesion of new adhesive and finish materials.

3.2 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
- B. Prohibit traffic until filler is cured.
- C. Clean substrate.
- D. Apply primer as required to prevent "bleed-thru" or interference with adhesion by substances cannot be removed.

3.3 INSTALLATION - SHEET FLOORING

- A. Lay flooring with joints and seams in accordance with seaming plan. Lay out seams to avoid widths less than 1/3 of roll width; match patterns carefully at seams.
- B. Double cut sheet; provide heat welded seams.
- C. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.
- D. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated. Secure resilient strips by adhesive.
- E. Install coved base as detailed on drawings, using coved base filler as backing at floor to wall junction.
- F. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- G. Install flooring in recessed floor access covers. Maintain floor pattern.
- H. At movable partitions, install flooring under partitions without interrupting floor pattern.
- I. Install feature strips and floor markings where indicated. Fit joints tightly.

3.4 INSTALLATION - TILE FLOORING

- A. Mix tile from container to ensure shade variations are consistent when tile is placed.
- B. Lay flooring with joints and seams as shown on floor pattern plans to produce symmetrical tile pattern.
- C. Allow minimum 1/2 full size tile width at room or area perimeter.
- D. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- E. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.
- F. Install flooring in recessed floor access covers. Maintain floor pattern.
- G. At movable partitions, install flooring under partitions without interrupting floor pattern.
- H. Install feature strips and floor markings where indicated. Fit joints tightly.

3.5 INSTALLATION - BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 36 inches between joints.
- B. Miter internal corners. At external corners, use pre-molded units. At exposed ends, use pre-molded units.

- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

3.6 CLEANING

- A. Section 01700 - Execution and Closeout Requirements: Final cleaning.
- B. Remove excess adhesive from floor, base, and wall surfaces without damage.
- C. Clean, seal, and maintain resilient flooring products.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 01700 - Execution and Closeout Requirements: Protecting installed construction.
- B. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

SECTION 09 65 13 - RESILIENT BASE AND ACCESSORIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

B. Section Includes:

1. Resilient base
2. Resilient stair accessories
3. Resilient molding accessories
4. Adhesive and related accessories

C. Related Sections:

1. Division 07 Section "Joint Sealants" for single-component and multi-component elastomeric, latex, silicone, urethane and other joint sealants.
2. Division 09 Section "Resilient Tile Flooring" for resilient floor tile.

1.3 ACTION SUBMITTALS

- A. Submit items in accordance with Division 01 Section "Submittal Procedures."
- B. Product Data: For each type of product indicated, submit two (2) copies of manufacturers' product data, installation instructions, and accessories specified and/or required by manufacturer.
- C. Samples for Verification: Submit one (1) Sample for each type of product indicated in manufacturer's standard-size, of each resilient product color, texture, and pattern required.
- D. Control Samples: Contractor to retain duplicate set of submitted Samples from the same production as the submitted Samples on site until the Project is completed.
- E. Product Schedule: See Finish Material Listing in Finish Drawings.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials/attic stock that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Maintenance Materials: Contractor to coordinate with Owner the quantity of maintenance materials required for each product.

1.5 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
- B. Mockups: Provide resilient products with mockups specified in other Sections.

1.6 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.

1.7 PROJECT 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. 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.

PART 2 - PRODUCTS

2.1 RESILIENT BASE

- A. Resilient Base:
 - 1. Manufacturers: Subject to compliance with requirements, see Finish Material Listing in Finish Drawings for Basis of Design.
- B. Resilient Base Standard: ASTM F 1861
 - 1. Material Requirement: Type TS (rubber, vulcanized thermoset)
 - 2. Manufacturing Method: Group I (solid, homogeneous)
- C. Style: See finish materials listing in the finish drawings
- D. Minimum Thickness: See Finish Material Listing in Finish Drawings.
- E. Height: See Finish Material Listing in Finish Drawings.
- F. Lengths: Coils and/or sections in manufacturer's standard length

- G. Outside Corners: Job formed
- H. Inside Corners: Preformed
- I. Finish Colors and Patterns: See Finish Material Listing in Finish Drawings.

2.2 RESILIENT STAIR ACCESSORIES

- A. Resilient Stair Treads:
 - 1. Manufacturers: Subject to compliance with requirements, see Finish Material Listing in Finish Drawings for Basis of Design. Resilient Stair Treads Standard: ASTM F 2169.
 - 2. Material Requirement: Type TS (rubber, vulcanized thermoset)
 - 3. Surface Design:
 - a. Class 2, Pattern: See Finish Material Listing in Finish Drawings.
 - 4. Manufacturing Method: Group 1, tread with embedded abrasive strips
- B. Nosing Style: Square, adjustable to cover angles between 60 and 90 degrees
- C. Nosing Height: 1-1/2 inches
- D. Thickness: 1/4 inch (6 mm) and tapered to back edge
- E. Size: Lengths and depths to fit each stair tread in one piece
- F. Risers: Smooth, flat, toeless, height and length to cover risers; produced by same manufacturer as treads and recommended by manufacturer for installation with treads.
 - 1. Thickness: 0.125 inch (3.2 mm)
- G. Stringers: Of same thickness as risers, height and length after cutting to fit risers and treads and to cover stair stringers; produced by same manufacturer as treads and recommended by manufacturer for installation with treads.
 - 1. Colors and Patterns: See Finish Material Listing in Finish Drawings.

2.3 RESILIENT MOLDING ACCESSORY

- A. Resilient Molding Accessory:
 - 1. Manufacturers: Subject to compliance with requirements, see Finish Material Listing in Finish Drawings for Basis of Design. Description: See Finish Material Listing and floor transition details in Finish Drawings.
- B. Material: As standard with manufacturer.
- C. Profile and Dimensions: See Finish Material Listing and floor transition details in Finish Drawings.
- D. Colors and Patterns: See Finish Material Listing and floor transition details in Finish Drawings.

2.4 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
 - 1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), except that adhesive for rubber stair treads shall have a VOC content of 60 g/L or less.
- C. Stair-Tread-Nose Filler: Two-part epoxy compound recommended by resilient tread manufacturer to fill nosing substrates that do not conform to tread contours.
- D. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edges of tiles, and in maximum available lengths to minimize running joints.
- E. Floor Polish: Provide protective liquid floor polish products as recommended by resilient stair tread manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates for Resilient Stair Treads and Accessories: 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 manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.
 - 4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after all substrates pass testing.
 - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with

- installation only after substrates have maximum moisture-vapor-emission rate allowed by manufacturer(s) for each product specified in 24 hours.
- b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have maximum relative humidity level measurement allowed by manufacturer(s) for each product specified.
 - C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
 - D. Do not install resilient products until they are same temperature as the space where they are to be installed.
 - E. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
 - F. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 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 practicable 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 Inside Corners: Install preformed corners before installing straight pieces.
- H. Job-Formed Outside Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Stair Accessories:
 - 1. Use stair-tread-nose filler to fill nosing substrates that do not conform to tread contours.
 - 2. Tightly adhere to substrates throughout length of each piece.
 - 3. For treads installed as separate, equal-length units, install to produce a flush joint between units.

- C. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of all resilient floor covering that would otherwise be exposed per floor transition details.

3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of 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 surfaces thoroughly.
 - 3. Damp-mop 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. Floor Polish: Remove soil, visible adhesive, and surface blemishes from resilient stair treads before applying liquid floor polish.
- E. Apply liquid floor polish per manufacturers' recommendations.
- F. Joint Sealant: Coordinate with floor finish material for requirements concerning applying sealant at door frames and other joints and penetrations.
- G. Cover resilient products until Substantial Completion.

END OF SECTION 09 65 13

SECTION 09 67 23 - RESINOUS FLOORING – URETHANE BODY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes one resinous flooring system, one with urethane body.
 - 1. Application Method: Notched Squeegee.
 - 2. Resinous flooring system with integral cove bases.
- B. Related Requirements:
 - 1. Section 017419 "Construction Waste Management" for administrative and procedural requirements for salvaging, recycling and disposing of nonhazardous construction waste.
 - 2. Section 079200 "Joint Sealants" for sealants installed at joints in resinous flooring systems.
 - 3. Section 033000 "Cast-in-Place Concrete" for concrete substrates to receive resinous flooring.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.
- B. Samples for Verification: For each resinous flooring system required, 5 inches (150 mm) square, applied to a rigid backing.
- C. Product Schedule: Use resinous flooring designations indicated in Part 2 and room designations indicated on Drawings in product schedule.
- D. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
- E. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
- F. Material Test Reports: For each resinous flooring component.
- G. Maintenance Data: For resinous flooring to include in maintenance manuals.
- H. Material Certificates: For each resinous flooring component, signed by manufacturer.

1.4 QUALITY ASSURANCE

- A. No request for substitution shall be considered that would change the generic type of floor system specified (i.e. Urethane liquid applied mortar with topcoats). Equivalent materials of other manufacturers may be substituted only on approval of Architect or Engineer. Request for substitution will only be considered only if submitted 10 days prior to bid date. Request will be subject to specification requirements described in this section.
- B. Installer Qualifications: Engage an experienced installer (applicator) who is experienced in applying resinous flooring systems 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, and who is acceptable to resinous flooring manufacturer.
1. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.
 2. Contractor shall have completed at least 10 projects of similar size and complexity.
 3. Minimum of 5 years' experience in applying resinous flooring systems 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, and who is acceptable to resinous flooring manufacturer.
 4. Engage an installer who employs only persons trained and approved by resinous flooring manufacturer for applying resinous flooring systems indicated.
- C. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, through one source from a single manufacturer, with not less than ten years of successful experience in manufacturing and installing principal materials described in this section. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.
- D. Manufacturer Field Technical Service Representatives: Resinous flooring manufacturer shall retain the services of Field Technical Service Representatives who are trained specifically on installing the system to be used on the project.
1. Field Technical Services Representatives shall be employed by the system manufacturer to assist in the quality assurance and quality control process of the installation and shall be available to perform field problem solving issues with the installer.
- E. Mockups: Apply mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Apply full-thickness mockups on 48-inch- (1200-mm-) square floor area selected by Architect.
 - a. Include 48-inch (1200-mm) length of integral cove base.
 2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- F. Pre-installation Conference:
1. General contractor shall arrange a meeting not less than thirty days prior to starting work.
 2. Attendance:
 - a. General Contractor

- b. Architect/Owner's Representative.
- c. Manufacturer/Installer's Representative.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.
- B. Store materials to prevent deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects. Store materials in their original, undamaged packages and containers, inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures of excessive heat and freezing, and humidity. Material subjected to excessive heat or freezing shall be separated from inventory and destroyed by mixing all three components. The solid reacted product shall be disposed of in an environmentally sound and regulatory compliant manner.
- C. All materials used shall be factory pre-weighed and pre-packaged in single, easy to manage batches to eliminate on site mixing errors. No on-site weighing or volumetric measurements allowed.
- D. Shelf Life: 1 (one) year after date of manufacture, in unopened containers, under normal conditions.
- E. Condition materials for use to 60°-85°F (15°-30°C) for 24 hours prior to application.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.
- B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.
- C. Close spaces to traffic during resinous flooring application and for not less than 24 hours after application, unless manufacturer recommends a longer period.
- D. Concrete substrate shall be properly cured. A vapor barrier must be present for concrete subfloors on or below grade. Otherwise, an osmotic pressure resistant grout must be installed prior to the resinous flooring. Consult manufacturer technical service department for wood or other substrates.

1.7 WARRANTY

- A. Manufacturer shall furnish a single, written warranty covering both material and workmanship for a period of (1) full year from date of installation or provide a joint and several warranty signed on a single document by material manufacturer and applicator jointly and severally warranting the materials and workmanship for a period of (1) full year from date of installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS FOR RESINOUS FLOORING SYSTEMS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include,
1. Slip resistance index of minimum 0.6 for wet floor conditions.
 2. VOC Content of Liquid-Applied Flooring Components: Not more than 100 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Acceptable Manufacturers:
1. Stonhard, Inc. Basis of Design.
 2. Sika Corp.
 3. BASF.
 4. Dur-a-Flex.
 5. Dudick
 6. Approved Equals

2.2 MATERIALS

- A. Epoxy Resinous Flooring System: RES #1
1. System Description: Stonhard, Inc.; Stongard® MR
- B. System Characteristics:
1. Color and Pattern: As indicated in the Room Finish Schedule.
 2. Wearing Surface: Texture TBD.
 3. Finish: Gloss.
 4. Integral Cove Base: Alternate 4 inches, or cover curb height
 5. Overall System Thickness: 1/16" (60 mils)
- C. System Components: Manufacturer's standard components that are compatible with each other and as follows:
1. Primer Coat:
 - a. Material Basis: Stonhard Standard Primer
 - b. Resin: (2) two component Epoxy
 - c. Formulation Description: 100 percent solids.
 - d. Application Method: Squeegee back roll.
 - e. Number of Coats: (1) one.
 2. Body Coat:
 - a. Material design basis: Stonproof ME7
 - b. Resin: Urethane Membrane.

- c. Formulation Description: 100 percent solids elastomeric.
 - d. Application Method: Notched Trowel screed or 60 mil squeegee.
 - 1) Number of Coats: One.
 - e. Thickness: 60 mils, nominal.
3. Top Coat: Stonkote GS4, general service sealing
- a. Material design basis: Stonkote GS4
 - b. Resin: Epoxy.
 - c. Formulation description: 100% solids.
 - d. Type: pigmented.
 - e. Finish: standard.
 - f. Texture: Aggregate additives for slip-resistant surface. 90# grit silica. Provide samples for approval.
 - g. Number of Coats: One.
- D. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:
- 1. Elongation: 200% per ASTM D 412.
 - 2. Tensile Strength: 1,200 psi per ASTM D 412.
 - 3. Hardness: 70, Shore D per ASTM D 2240.
 - 4. Abrasion Resistance: 0.06 gm per ASTM D-4060, CS-17
 - 5. Water Absorption : 0.1% per ASTM C-413

2.3 MISCELLANEOUS ACCESSORIES

- A. Patching, Leveling and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.
- B. Joint Sealant: Type recommended or produced by resinous flooring manufacturer for type of service and joint condition indicated. Allowances should be included for Stonflex MP7 joint fill material.

PART 3 - EXECUTION

3.1 PREPARATION

- A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry, and neutral pH substrate for resinous flooring application.
- B. Wood Substrates: Provide surfaces free of damage, adhesives,, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.
 - 1. Mechanically prepare substrates as follows:
 - a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup, or Diamond Grind with a dust free system.
 - 2. Repair damaged and deteriorated wood according to resinous flooring manufacturer's written recommendations.
 - a. Provide two layers of ¾" moisture tolerant plywood
 - b. Install plywood on joists no greater than 16" on center.
 - c. Plywood substrate to be glued and screwed to framing and between layers for maximum resistance to deflection and movement.

Meet the following requirements.

- a. Keep in situ probe test, ASTM F 2170. Proceed with application only after substrates do not exceed a maximum potential equilibrium relative humidity of 80 percent, perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 6 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) of slab in 24 hours.
 - b. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. of slab in 24 hours.
 - c. Perform additional moisture tests recommended by manufacturer. Proceed with application only after substrates pass testing.
- C. Use patching and fill material to fill voids and depressions in wood substrates including joints according to manufacturer's written instructions.
 - D. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written recommendations. Allowances should be included for Stonflex MP7 joint fill material, and CT5 concrete crack treatment.

3.2 APPLICATION

- A. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.
 - 1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum inter-coat adhesion.
 - 2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
 - 3. At substrate expansion and isolation joints, provide joint in resinous flooring to comply with resinous flooring manufacturer's written recommendations.
 - a. Apply joint sealant to comply with manufacturer's written recommendations.
- B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- C. Membrane Base: Mix and apply membrane base over fully cured primer using manufacturer's specially designed squeegees and rollers
- D. Apply topcoat(s) in number of coats indicated for flooring system and at spreading rates recommended in writing by manufacturer.

3.3 TERMINATIONS

- A. Chase edges to "lock" the flooring system into the concrete substrate along lines of termination.
- B. Penetration Treatment: Lap and seal resinous system onto the perimeter of the penetrating item by bridging over compatible elastomer at the interface to compensate for possible movement.
- C. Trenches: Continue flooring system into trenches to maintain monolithic protection. Treat cold joints to assure bridging of potential cracks.
- D. Treat floor drains by chasing the flooring system to lock in place at point of termination.

3.4 JOINTS AND CRACKS

- A. Treat joints to bridge potential cracks and to maintain monolithic protection.
- B. Treat joints in substrate to maintain monolithic protection on horizontal and vertical surfaces as well as horizontal and vertical interfaces.

3.5 FIELD QUALITY CONTROL

- A. Material Sampling: Owner may at any time and any number of times during resinous Flooring application require material samples for testing for compliance with requirements.
 - 1. Owner will engage an independent testing agency to take samples of materials being used. Material samples will be taken, identified, sealed, and certified in presence of Contractor.

2. Testing agency will test samples for compliance with requirements, using applicable referenced testing procedures or, if not referenced, using testing procedures listed in manufacturer's product data.
3. If test results show applied materials do not comply with specified requirements, pay for testing, remove non-complying materials, prepare surfaces coated with unacceptable materials, and reapply flooring materials to comply with requirements.

3.6 CLEANING, PROTECTION AND CURING

- A. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 24 hours.
- B. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. General Contractor is responsible for protection and cleaning of surfaces after final coats.
- C. Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacturer. General contractor is responsible for cleaning prior to inspection.

END OF SECTION 09 67 23

SECTION 09 91 00 - PAINTING

PART 1 - GENERAL

1.1 GENERAL

- A. Exterior, interior, high-performance coatings, staining and transparent finishing.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 SUMMARY

- A. Furnish labor, materials, tools and other equipment, and services necessary to provide the surface preparation and the application of paints, high performance coatings, stains and transparent finish systems, including all accessory items as required for a complete installation:

- 1. Interior and exterior, vertical and horizontal substrates:
 - a. Concrete
 - b. Wood Paneling
 - c. Gypsum board (Interior and Exterior)

- B. Work under this Section also includes moisture and alkalinity testing, and surface preparation of substrates as required for acceptance of finishes, including but not necessarily limited to, cleaning, small crack repair, patching, sanding, caulking, any other work required to provide smooth substrates, and specific pre-treatments such as sealing and priming of surfaces to the limits defined within the Master Painters Institute's (MPI) "Architectural Painting Manual" and/or "Maintenance Repainting Manual."

- C. Related Requirements:

- 1. Division 01 Section "Temporary Facilities and Controls" for temporary/permanent climate requirements.
- 2. Division 03 Section "Cast-In-Place Concrete" for special finishes.
- 3. Division 04 Section "Unit Masonry" for paints and sealers over concrete or clay units.
- 4. Division 05 Sections for shop priming of metal substrates such as exposed structural steel, decking and miscellaneous metal which is not scheduled to have fire-resistive materials with primers and finish paints specified in this Section.
- 5. Division 06 Sections for shop priming carpentry with primers specified in this Section.
- 6. Division 07 Section "Traffic Coatings" for pedestrian traffic coatings, vehicular traffic coatings, equipment room floor coatings, and pavement-marking paints.
- 7. Division 08 Sections for factory priming wood windows and doors with primers specified in this Section.
- 8. Division 09 Section "Gypsum Board" for surface preparation of gypsum board.
- 9. Division 09 Painting Sections for special-use coatings.
- 10. Divisions 22, 23 and 26 for additional painting, color coding and stenciling requirements.
- 11. Division 32 for alkyd-resin and glass bead pavement-marking paints and decorative concrete staining.

1.4 REFERENCE STANDARDS

- A. The following reference standard shall be used in conjunction along with additional more stringent information stated herein:
1. Master Painters Institute (MPI)
 - a. MPI Architectural Painting Specification Manual
 2. This specification shall be supplemented by any applicable federal, state and local building codes, guidelines, regulations, and standards adopted in the immediate geographic area of the Project; insurance rating organizations; including all other Authorities Having Jurisdiction.

1.5 ACTION SUBMITTALS

- A. Submit items in accordance with Division 01 Section "Submittal Procedures."
- B. Product Data: For each type of product indicated, submit two (2) copies of manufacturers' product data, installation instructions and accessories specified and /or required by manufacturer.
- C. Samples for Verification:
1. For each type of paint and high-performance coating system and in each color and gloss of topcoat:
 - a. Submit one (1) Sample on rigid backing, 8 inches square.
 - b. Step coats on Samples to show each coat required for system.
 - c. Label each coat of each Sample.
 - d. Label each Sample for location and application area.
 2. For each type of stain and transparent finish system and in each color and gloss of finish indicated.
 - a. Submit one (1) Sample on representative samples of actual wood substrates, 8 inches square.
 - b. Label each Sample for location and application area.
- D. Control Samples: Contractor to retain duplicate set of Samples from the same production as the submitted Samples on site until the Project is completed.
- E. Product List: For each product indicated, submit one (1) copy. Include the following:
1. Indicate each product and cross-reference to finish system color including locations of application areas. Use same designations indicated on Drawings and in schedules. Provide Final Product List and include Finish System Chart in closeout documents.
 2. VOC content of each product specified.
 3. Include product list in closeout Submittals.

1.6 MISCELLANEOUS MATERIALS

- A. Furnish extra materials from the same product run that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Paint, high-performance coatings, stains and transparent finishes: 1 gal. of each material, color and finish applied.
- B. Oils, turpentine, and other materials required to accomplish this work shall be first quality materials.

- C. Thinners shall be of a type as recommended by the paint manufacturer for each product specified.
- D. Turpentine shall comply with requirements of Federal Specification TT-T-801.
- E. Mineral Spirits shall comply with requirements of Federal Specification TT-T-291 Grade 1.

1.7 QUALITY ASSURANCE

- A. **Applicator Qualifications:** A company or individual, qualified and approved by Manufacturer/Supplier, with a minimum of five years of continuous, uninterrupted experience in successfully applying work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance, and who agrees to employ only skilled tradesmen with a minimum of three years' experience.
- B. **Mockups:** Apply mockups of each finish 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 including lighting for application of each finish system specified in Part 3.
 - 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.
- C. **Pre-Installation Conference:** Conduct conference at Project site prior to commencement of field installation with Contractor, Subcontractor, Architect/Designer and others, as required.
 - 1. Review requirements for substrates and for preparation by other trades.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers with original labels in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F nor greater than 90 deg F and/or more restrictive requirements as per manufacturer.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.
- B. Conform to requirements of local Authorities Having Jurisdiction in regard to the handling, mixing, application and disposal of all paint materials, related waste materials, and/or hazardous materials.

1.9 FIELD CONDITIONS

- A. Apply paints, high performance coatings, stains and transparent finishes only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F and/or more restrictive requirements as per manufacturer.
- B. Do not apply paints, high-performance coatings, stains and transparent finishes when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp, wet and/or unprepared surfaces. Coordinate any more restrictive requirements with manufacturer.
- C. Only apply paints when atmosphere is relatively free of airborne dust and contaminates.
- D. When dry abrasive blasting carbon steel surfaces, the dew point temperature in the space must be maintained at least 17 deg F. lower than the temperature of the surface being prepared or greater as per manufacturers' recommendations.
- E. During paint and coating application, the dew point temperature in the space must be maintained at least 10 deg F. lower than the temperature of the surface being painted along with additional more stringent parameters set forth by paint and coating manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
- B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
- C. PAINT, GENERAL
- D. Material Compatibility:
 - 1. Provide materials for use within each paint system that are 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, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
 - 3. Provide products of same manufacturer from each coat in a finishing system and prepare paints as per manufacturer's recommendations.
- E. VOC Content: Products shall comply with VOC limits of Authorities Having Jurisdiction
- F. Colors: See the Finish Materials Listing in the Finish Drawings.

2.2 SOURCE QUALITY CONTROL

- A. Testing of Finish Materials: Owner reserves the right to invoke the following procedure:
 - 1. Owner will engage the services of a qualified testing agency to sample paint, high-performance coatings and wood finishing 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, high-performance coatings and wood finishing 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 refinish surfaces finished with rejected materials. Contractor will be required to remove rejected materials from previously finished surfaces if, on refinishing with complying materials, the two finishes are incompatible or produce results that, in the opinion of the Architect, are aesthetically unacceptable.

PART 3 - EXECUTION

3.1 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 (or less as per manufacturer):
 - 1. Concrete: 12 percent
 - 2. Masonry (Clay and CMU): 12 percent
 - 3. Wood: 15 percent
 - 4. Portland Cement Plaster: 12 percent
 - 5. Gypsum Board: 12 percent
 - 6. Plaster: 12 percent
- C. Interior and Exterior Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Verify gypsum board finish level prior to application of paints and high-performance coatings. Coordinate with Gypsum Board Specification.
- F. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and finish systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be finished. 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 finish 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, high-performance coatings, stains and transparent finishes including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and re-prime substrate with compatible primers or apply tie coat as required to produce finish systems indicated.
- D. Concrete Substrates: Allow concrete to cure for 28 days. 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.
 - 1. Concrete Floors: Prepare concrete floors by abrasive blast cleaning and/or mechanically profiling in accordance with manufacturer's recommendations. Acid etching may be used if specifically recommended by manufacturer.
 - 2. High Performance Coatings:

- a. Clean surfaces with pressurized water. Use pressure range in accordance with MPI Manual.
 - b. Abrasive blast clean surfaces to comply with SSPC-SP 7/NACE No. 4, "Brush-Off Blast Cleaning."
- E. Masonry Substrates: Allow masonry to cure for 28 days. Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
1. High-Performance Coatings:
 - a. Clean surfaces with pressurized water. Use pressure range in accordance with MPI Manual.
- F. Wood Substrates:
1. Wood substrates to be finished with paint or high-performance coatings.
 - a. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for use in paint system indicated.
 - b. Sand surfaces that will be exposed to view and dust off.
 - c. Prime edges, ends, faces, undersides, and backsides of wood.
 - d. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 2. Wood substrates to be stained:
 - a. Exterior Wood Substrates:
 - 1) Scrape and clean knots and apply coat of knot sealer before applying primer.
 - 2) Prime edges, ends, faces, undersides, and backsides of wood.
 - b. For varnish coated stained wood, stain edges and ends and prime with varnish. Prime undersides and backsides with varnish.
 - 1) Countersink steel nails, if used, and fill with putty or plastic wood filler tinted to final color. Sand smooth when dried.
 - c. Interior Wood Substrates:
 - 1) Scrape and clean knots and apply coat of knot sealer before applying primer.
 - 2) Apply wood filler paste to open-grain woods, as defined in "MPI Architectural Painting Specification Manual," to produce smooth, glasslike finish.
 - 3) Sand surfaces that will be exposed to view and dust off.
 - 4) After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- G. Mold and/or Mildew: Notify Owner and Architect of all locations where mold/mildew is discovered prior to proceeding with application of any finish systems. Removal of substrate material will be required at all gypsum product locations and at other areas as per Owner/Architect's direction.

3.3 APPLICATION

- A. Apply paints, high-performance coatings, stains and transparent finishes according to manufacturer's written instructions and recommendations in "MPI Manual."
 1. Use applicators and techniques suited for finish system and substrate indicated.
 2. Finish surfaces behind movable items same as similar exposed surfaces. Before final installation, finish surfaces behind permanently fixed items with prime coat only.
 3. Finish both sides and edges of doors and entire exposed surface of door frames.

4. Finish front and back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 5. Prime glazing stops and glazing beads before glass is installed.
 6. Finish entire exposed surface of window frames and sashes.
 7. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 8. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat but 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 finishes to produce surface films without cloudiness, spotting, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Apply a minimum of four coats of paint or high-performance coating to surfaces specified to receive deep or bright colors.
- F. Back-prime exterior and interior woodwork which is to receive paint finish, with exterior primer.
- G. Remove grilles, covers, and access panels and paint separately.
- H. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
1. Paint the following Work where exposed in equipment rooms or as directed by Architect:
 - a. Equipment, including panelboards, switch gear tanks, stands and supports
 - 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
 - h. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or another paintable jacket material.
 - i. Equipment, stands, supports, intake bonnets, flutes and all factory-primed items to receive final paint that are exposed to view in equipment rooms, on the roof or outside the building.
 2. Paint the following Work where exposed in occupied spaces or as directed by Architect:
 - a. Equipment, including panelboards
 - b. Uninsulated metal piping
 - c. Uninsulated plastic piping
 - d. Pipe hangers and supports
 - e. Metal conduit
 - f. Plastic conduit
 - g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or another paintable jacket material.
 - h. Equipment, stands, supports, intake bonnets, flutes and all factory-primed items to receive final paint that are exposed to view in equipment rooms, on the roof or

outside the building. outside the building.

3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces with primer and one coat of "black" (non-reflecting) paint recommended by manufacturer.
4. Paint disconnect switches for fire alarm system and exit light systems in 'red' enamel, unless factory finished in specified color.
5. Keep all sprinkler heads and escutcheons free of paint.
6. Backprime and paint face and edges of fire-retardant plywood service panels for telephone and electrical equipment before installation, to match adjacent wall surface. Leave equipment in original finish except for touch up as required, and paint conduits, mounting accessories and other unfinished items.
7. Any code required fire-retardant wood/plywood used for electrical and/or telephone equipment shall retain one grade/label stamp free from paint.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test finishes for dry film thickness.
 1. Contractor shall touch up and restore finished surfaces damaged by testing.
 2. If test results show that dry film thickness of applied finish does not comply with manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing finish application, clean spattered surfaces. Remove spattered finishes by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from finish application. At completion of construction activities, 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 09 91 00

DIVISION 10 SPECIALTIES

SECTION 10 14 23 - PANEL SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Room-identification signs.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For panel signs.

1. Include fabrication and installation details and attachments to other work.
2. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size.

C. Samples for Verification: For each type of sign assembly showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:

1. Room-Identification Signs: Full-size Sample.

D. Sign Schedule: Use same designations specified or indicated on Drawings or in a sign schedule.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.5 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
 - a. Deterioration of finishes beyond normal weathering.
 - b. Deterioration of embedded graphic image.
 - c. Separation or delamination of sheet materials and components.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANEL SIGNS, GENERAL

- A. All signage shall conform with the overall design criteria for the project:
 - 1. Confirm with design team prior to making any orders for any changes.

2.2 PERFORMANCE REQUIREMENTS

- A. Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities for signs.

2.3 SIGNS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated by the following:
 - 1. 2/90 Sign Systems – to be confirmed.
- B. Room-Identification Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
 - 1. Structural rails shall be 6063-T5 extruded aluminum in accordance with ASTM B 221 and ASTM B 209. The rail shall be the internal horizontal member spaced to allow uniform, modular sizing of inserts, anodized black. The rail shall be capable of accepting plastic or aluminum copy inserts. Rail shall allow for different mounting devices, including wall mounting for screw-on applications and pressure sensitive tape. Rail joiners shall be extruded in black PVC plastic. Rail joiners shall connect structural rails together providing a butt joint along their edges. Rail joiners shall not be visible in rail assembly.
 - 2. Solid copy inserts shall be 0.090 inch extruded ABS plastic core with 0.003 inch acrylic cap bonded during the extrusion/ texturing process.
 - 3. Braille dots shall conform to standard dimensions for Grade 2 Braille.
 - a. Dot diameter: 0.059 inch
 - b. Dot height: 0.025 inch
 - c. Inter-dot spacing: 0.090 inch
 - d. Horizontal separation between cells: 0.241 inch
 - e. Vertical separation between cells: 0.395 inch.
 - 4. End caps shall be 6063-T5 extruded aluminum, with square corners. End caps shall interlock to structural rail with steel spring clips to form an integral unit, enclosing and securing the changeable copy inserts, without requiring tools for assembly. End caps shall be interchangeable to either end of sign and to other signs in the system of equal height.
 - 5. Top/bottom trim shall be extruded in 6063-T5 aluminum, anodized black, to provide decorative trim cap, which butts flush to adjacent copy insert and encloses top or bottom of structural rail and copy insert.
 - 6. Mounting: Surface mounted to wall with two-face tape.
 - 7. Text and Typeface: Accessible raised characters and Braille, Arial.

2.4 ACCESSORIES

PANEL SIGNAGE

- A. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045 inch thick, with adhesive on both sides.

2.5 FABRICATION

- A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.
 - 1. Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
 - 2. Form work to required shapes and sizes, with true curves, lines and angles. Provide necessary rebates, lugs and brackets for assembly of units.
 - 3. Contact surfaces of connected members shall be true. Assemble so joints will be tight and practically unnoticeable, without use of filling compound.
 - 4. Signs shall have fine, even texture and be flat and sound. Lines and miters shall be sharp, arises unbroken, profiles accurate and ornament true to pattern. Plane surfaces shall be smooth, flat and without oil-canning, free of rack and twist. Maximum variation from plane of surface shall be plus or minus 0.032 inch. Restore texture to filled or cut areas.
 - 5. Extruded members shall be free from extrusion marks. Square turns and corners shall be sharp, curves true.
 - 6. Exposed ends and edges shall be mill smooth, with corners slightly rounded.
 - 7. All painted surfaces shall be properly primed. Finish coating of paint shall have complete coverage with no light or thin applications allowing substrate or primer to show. Parts shall be checked for approval against the color match master chip. Finished surface shall be smooth, free of scratches, gouges, drips, bubbles, thickness variations, foreign matter and other imperfections.

2.6 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.
- C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.

2.7 ALUMINUM FINISHES

- A. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 - EXECUTION

3.1 EXAMINATION

PANEL SIGNAGE

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of signage work.
- B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
 - 1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
 - 2. Install signs so they do not protrude or obstruct according to the accessibility standard.
 - 3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
- B. Room-Identification Signs and Other Accessible Signage: Install in locations on walls as indicated.
- C. Mounting Methods:
 - 1. Two-Face Tape: Clean bond-breaking materials from substrate surface and remove loose debris. Apply tape strips symmetrically to back of sign and of suitable quantity to support weight of sign without slippage. Keep strips away from edges to prevent visibility at sign edges. Place sign in position, and push to engage tape adhesive.

3.3 ADJUSTING AND CLEANING

- A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs 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 signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 10 14 23

SECTION 10 28 00 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Public-use washroom accessories.
 - 2. Custodial accessories.
- B. Related Sections:
 - 1. Section 088300 "Mirrors" for frameless mirrors.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include the following:
 - 1. Construction details and dimensions.
 - 2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
 - 3. Material and finish descriptions.
 - 4. Features that will be included for Project.
 - 5. Manufacturer's warranty.

1.3 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from manufacturer.

1.6 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.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.
- B. Brass: ASTM B 19, flat products; ASTM B 16/B 16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.

- C. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold -rolled, commercial steel), **0.036-inch** minimum nominal thickness.
- D. Galvanized-Steel Sheet: ASTM A 653/A 653M, with **G60** hot-dip zinc coating.
- E. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.
- G. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

2.2 PUBLIC-USE WASHROOM ACCESSORIES

- 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. American Specialties, Inc.
 - 2. Bradley Corporation.
 - 3. A & J Washroom Accessories, Inc.
 - 4. Bobrick Washroom Equipment, Inc.
 - 5. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
- B. Basis of Design – to conform with the two buildings already under construction:
 - 1. American Specialties, Inc.
- C. Toilet Tissue (Roll) Dispenser: **As indicated on Drawings**
- D. Combination Towel (Folded) Dispenser/Waste Receptacle: **As indicated on Drawings**
- E. Liquid-Soap Dispenser: **As indicated on Drawings**
- F. Grab Bar:
 - 1. Basis-of-Design Product: American Specialties, Inc.
 - 2. Mounting: Flanges with concealed fasteners.
 - 3. Material: Stainless steel, **0.05 inch** thick.
 - 4. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.
 - 5. Outside Diameter: **1-1/4 inches**.
 - 6. Configuration and Length: As indicated on Drawings.
- G. Sanitary-Napkin Disposal Unit: **As indicated on Drawings**
- H. Seat-Cover Dispenser: **As indicated on Drawings**
- I. Door Hook(s): **As indicated on Drawings**

2.3 CUSTODIAL ACCESSORIES

- 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. American Specialties, Inc.
 - 2. Bradley Corporation.
 - 3. A & J Washroom Accessories, Inc.
 - 4. Bobrick Washroom Equipment, Inc.
 - 5. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
 - 6. Zurn Industries, LLC

- B. Mop Sink: **(Provide in Janitorial (1 Total) – As indicated on Drawings.**
 - 1. Basis-of-Design Product: Zurn – Z1996-24.

- C. Mop and Broom Holder: **(Provide in Janitorial (1 Total) – As indicated on Drawings.**
 - 1. Basis-of-Design Product: ASI - 1315.
 - 2. Description: Unit with shelf, hooks, holders, and rod suspended beneath shelf.
 - 3. Length: **36 inches.**
 - 4. Hooks: Three.
 - 5. Mop/Broom Holders: Four, spring-loaded, rubber hat, cam type.
 - 6. Material and Finish: Stainless steel, No. 4 finish (satin).
 - 7. Shelf: Not less than nominal **0.05-inch-** thick stainless steel.
 - 8. Rod: Approximately **1/4-inch-** diameter stainless steel.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units' level, plumb, and firmly anchored in locations and at heights indicated.

- B. Install accessories in compliance with the 2010 ADA Standards for Accessible Design and depicted in the drawings.

END OF SECTION 10 28 00

SECTION 10 44 13 - FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fire-protection cabinets for the following:
 - a. Portable fire extinguishers.
- B. Related Requirements:
 - 1. Section 104416 "Fire Extinguishers."

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing recessed-, semi recessed-, or surface-mounting method and relationships of box and trim to surrounding construction.
- B. Shop Drawings: For fire-protection cabinets. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For each type of exposed finish required.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For fire-protection cabinets to include in maintenance manuals.

1.4 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

2.1 FIRE-PROTECTION CABINET

- A. Cabinet Type: Suitable for fire extinguisher.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
 - 2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
- B. Cabinet Construction: Nonrated.
- C. Cabinet Material: Cold-rolled steel sheet.
- D. Recessed Cabinet:
 - 1. Exposed Flat Trim: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
- E. Semi recessed 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. Rolled-Edge Trim: 2-1/2-inch backbend depth.
- F. Cabinet Trim Material: Steel sheet.
- G. Door Material: Steel sheet.
- H. Door Style: Vertical duo panel with frame.
- I. Door Glazing: Tempered float glass (clear).
- J. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
 - 1. Provide projecting door pull and friction latch.
 - 2. Provide continuous hinge, of same material and finish as trim, permitting door to open 180 degrees.
- K. Accessories:
 - 1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire-protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
- L. Materials:
 - 1. Cold-Rolled Steel: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.

- a. Finish: Baked enamel or powder coat.
 - b. Color: White.
2. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

2.2 FABRICATION

- A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.
 1. Weld joints and grind smooth.
 2. Provide factory-drilled mounting holes.
- B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.
 1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum **1/2 inch** thick.
 2. Miter and weld perimeter door frames.
- C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.3 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping.
- C. Finish fire-protection cabinets after assembly.
- D. Appearance of Finished Work: Noticeable variations in 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

3.1 EXAMINATION

- A. Examine walls and partitions for suitable framing depth and blocking where semirecessed cabinets will be installed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare recesses for semi recessed fire-protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

- A. General: Install fire-protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights indicated below:
- B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.
 - 1. Unless otherwise indicated, provide recessed fire-protection cabinets. If wall thickness is inadequate for recessed cabinets, provide semi recessed fire-protection cabinets.

3.4 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 10 44 13

SECTION 10 44 16 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes portable, hand-carried fire extinguishers.
- B. Related Requirements:
 - 1. Section 104413 "Fire Protection Cabinets."

1.2 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.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.4 COORDINATION

- A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.5 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. Failures include, but are not limited to, the following:
 - a. Failure of hydrostatic test according to NFPA 10.
 - b. Faulty operation of valves or release levers.
 - 2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 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

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers:

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

- 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.

2.3 MOUNTING BRACKETS

- A. Mounting Brackets: Manufacturer's standard steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or black baked-enamel finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fire extinguishers for proper charging and tagging.
1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.
- B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION 10 44 16

SECTION 22 42 33

WASH FOUNTAIN

PART 1 - GENERAL

- 1.1 SECTION INCLUDES
1. Wash Fountains.
- 1.2 RELATED SECTIONS
1. Division 22 Section "Domestic Water Piping Specialties" for thermostatic mixing valves.
- 1.3 REFERENCES
- A. American National Standards Institute (ANSI):
 1. ANSI Z124.3 Plastic Lavatories.
 2. ANSI Z124.6 Plastic Sinks.
 3. ANSI/ICPA SS-1-2001 Performance Standard for Solid Surface Material.
 - B. GREENGUARD Environmental Institute (GEI):
 1. GREENGUARD listed and certified low emitting products.
 - C. International Association of Plumbing and Mechanical Officials (IAPMO):
 1. Universal Plumbing Code (cUPC US and Canada) approvals.
 - D. National Fire Protection Association (NFPA):
 1. NFPA 70 - National Electrical Code.
 - E. Public Law 102-486, Energy Policy Act, requires that public lavatories manufactured after December 31, 1996, have flow rate or consumption not greater than 0.5 gpm (1.5 L/min.) or 0.25 gal. (0.95 L) per metering cycle.
 - F. Underwriters Laboratories, Inc.:
 1. UL 1951 - Electric Plumbing Accessories.
- 1.4 ACTION SUBMITTALS
- A. Product Data: For each product indicated mounting requirements and rough-in dimensions. Mark each sheet with product drawing designation.
- 1.5 QUALITY ASSURANCE
- A. Comply with Public Law 102-486 Energy Policy Act.
 - A. Electrical Components: Listed and labeled per NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- 1.6 WARRANTY
- A. Special Manufacturer's Warranty: Provide manufacturer's standard form in which manufacturer agrees to repair or replace products that fail in materials or workmanship.

1. Solid Surface Material: 10 years.
2. Other Materials and Components: One year.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide temperature-actuated water mixing valves manufactured by Bradley Corporation, Menomonee Falls, WI 53051, (800)272-3539, fax (262)251-5817, www.bradleycorp.com.

1. Submit requests for substitution in accordance with Instructions to Bidders and Division 01 General Requirements.

B. MATERIALS

- C. Lavatory Deck and Bowl Material: Fabricate lavatory units from bio-based resin and preconsumer recycled granules certified by approved independent testing agency as complying with ANSI/ICPA-SS-1-2001, ANSI Z124.3, and ANSI Z124.6, with the following minimum properties:

1. Basis of Design Product: **Bradley, Terreon RE** or a comparable product fabricated from the following materials:
 - a. DuPont, Corian Products.
2. Thickness: 1/2 inch (13 mm), minimum.
3. Liquid Absorption: 0.025 percent in 24 hours, per ASTM D 570.
4. Tensile Strength: 5000 psi (34 MPa), minimum, per ASTM D 638.
5. Thermal Expansion: 2.30, per ASTM D 696.
6. Hardness: 55-60, per ASTM D 785.
7. Fire Resistance: Class 1, per ASTM E 84.

2.2 WASHFOUNTAINS

- A. Floor-supported 8-User Accessible, Vandal-Resistant Shallow Bowl Washfountain **WFN#_3108_**: Preassembled bowl and pedestal unit constructed of stainless steel with chrome plated exposed fittings. Includes individual spray heads per station with stainless steel support tube, mixing valve, volume control valve, waste and supply connections with stops, strainers, and check valves. Vandal-resistant construction with concealed spray heads and connections, with support tube integrally welded to bowl. IPC/cUPC-certified by IAPMO.

1. Basis of Design Manufacturer/Model: **Bradley, Sentry Washfountain, SN2000 series.**
2. Bowl: Circular 54 inch (1372 mm) diameter.
3. Unit Height: 34 inch (864 mm)
4. Individual Spray Heads: with operating range of 20 to 80 psi (138 to 552 kPa), flow rate is .5 GPM per station.
 - a. Infrared Sensor Operation: Infrared sensing module and solenoid with automatic shut-off, with 110/24 VAC plug-in transformer.
5. Water Supply: Single tempered line.
6. Drain and Supply Configuration: Centrally rising vent with supplies from below.
7. Accessories:
 - a. Soap Dispenser: Liquid soap.
 - b. Hose Bibb: Loose key, threaded, solid brass, with polished chrome finish.

8. EXECUTION INSTALLATION

2.3

- A. Assemble fixtures and associated fittings and trim in accordance with manufacturer's instructions.
- B. Install fixture supports attached to building structure for fixtures requiring supports.
- C. Install fixtures onto waste-fitting seals or flanges and attach to supports or building structure.
- D. Install fixtures level, plumb, and firmly in place in accordance with manufacturer's rough-in drawings.
- E. Install water supply piping to each fixture requiring water supply connection. Provide stop on each supply in readily-serviced location. Fasten supply piping to supports or substrate.
- F. Install trap and waste piping to each fixture requiring sanitary system connection.
- G. Install escutcheons at exposed piping penetrations in finished locations and within cabinets.
- H. Seal joints between fixtures and walls, floors, and countertops with mildew-resistant silicone sealant.

FIELD QUALITY CONTROL

2.4

- A. Verify fixtures are correct categories and types specified at locations where installed. Verify installed heights and clearances meet requirements of authorities having jurisdiction.

2.5 CLEANING AND PROTECTION

- A. Repair or replace defective work, including damaged fixtures and components.
- B. Clean unit surfaces, test fixtures, and leave in ready-to-use condition.
- C. Install new batteries in battery-operated devices at time of Substantial Completion.
- D. Turn over keys, tools, maintenance instructions, and maintenance stock to Owner.
- E. Protect units with water-resistant temporary covering. Do not allow temporary use of plumbing fixtures unless approved in writing by Architect. Remove protection at Substantial Completion and dispose.

END OF SECTION 22 42 33

DIVISION 32 EXTERIOR IMPROVEMENTS

SECTION 323300 – HARDSCAPE
(SITE FURNISHINGS & SIGNAGE)

PART 1 GENERAL

1.1 SUMMARY

- A. Specific requirements concerning the various materials, structures, and arrangements which are safe to be installed are shown on drawings.
- B. These hardscape materials may include, but are not limited to, site signage, bollards, wayfinding, bike racks, benches, water fountains and trash receptacles.

1.2 DO NOT MAKE SUBSTITUTIONS

- A. If Contractor desires to make substitutions of materials, sufficient descriptive literature and material samples must be furnished to establish the material as an equal substitute. In addition, Contractor must state his reasons for desiring substitute materials. Submit this request and information to Landscape Architect.

1.3 APPROVAL AND SELECTION OF MATERIALS AND WORK

- A. The selection of all materials and execution of all operations required under the Drawings and Specifications is subject to the approval of Owner and Landscape Architect. They have the right to reject any and all materials and any and all Work which, in their opinion, does not meet requirements of the Contract Documents at any state of operations. The Contractor is to remove rejected work and or materials from Project Site and replace promptly.
- B. Delivery, Storage and Handling: Deliver material and equipment in such a manner as to not damage parts or decrease the useful life of equipment.
- C. Store materials away from detrimental elements.
- D. Handle, load, unload, stack and transport materials carefully to avoid damage.

1.4 QUALITY AND SIZE

- A. Material specified by name and/or model number in the Specifications, on the site or detailed drawings are used for the purpose of identification of materials and to insure specific use of that material in the construction of the system. No substitutions will be permitted without approval.
- B. Any products not specifically identified on the drawing with a make and/or model number in the Specifications or on the site or detailed drawings shall be submitted in a shop drawing format to the Landscape Architect for approval.

PART 2 ACCEPTANCE AND GUARANTEE

2.1 SUMMARY

- A. Substantial Completion: Submit written requests for inspection for Substantial Completion to Landscape Architect at least three calendar days prior to anticipated Date of Inspection and Testing. Substantial Completion cannot be granted and at the same time no further applications for payment shall be approved for more than 85% of contract until there has first been a walk-thru for head coverage at which time a "punch list" will be written consisting of items to be addressed and

corrected by Contractor immediately. Depending on the extent of the Work on the "punch list", the Landscape Architect will determine the job to be Substantially Complete or pending the completion of the "punch list".

- B. Review "punch list" Work jointly with Owner and Landscape Architect for Substantial Completion of total (contract) Work.

2.2 DATE OF SUBSTANTIAL COMPLETION

- A. Date of Substantial Completion will constitute beginning Date of One-Year Guarantee. This Date also constitutes the beginning of the warranty responsibilities and acceptance by Owner and Landscape Architect.

2.3 GUARANTEE

- A. All Work, products, equipment and materials for one year, beginning at Date of Substantial Completion as per (AIA Certificate of Substantial Completion/written letter of notification).
- B. Make good any damage, loss, destruction or failure. Repairs and replacements shall be done promptly and at no additional cost to Owner.
- C. Repair damage to grade, plants and other Work or property as necessary.
- D. If work is not acceptable during or at end of Guarantee Period Owner may elect either subsequent replacement or credit. Replacement products shall have a similar one-year guarantee from time of replacement.

PART 3.0 METHOD OF MEASUREMENT

3.1 METHOD OF MEASUREMENT

- A. All items to be installed or replaced are identified in the plans and details.

PART 4.0 PAYMENT

4.1 PAYMENT

- A. The Pay Items for site furnishings and signage shall determine the value of extra work or changes in the work, as applicable. They shall be considered complete and shall include all material, equipment, labor, installation costs, overhead and profit. Pay items shall be used uniformly for additions or deductions. The final amount paid for the work done will be the sum of the actual quantities of installed work, as approved in writing by the Owner. Bidder shall verify quantities of installed work, as approved in writing by the Owner. Bidder shall verify quantities by his own take-off from the Drawings and notify the Landscape Architect of discrepancies before submitting his Bid.

END OF SECTION 02805

SECTION 328400 – PLANTING IRRIGATION

PART 1 GENERAL

1.1 SUMMARY

- A. Extent of underground irrigation system is shown on Drawings and in the schedules.
- B. Provide all labor, materials and equipment required by or inferred from Drawings and Specifications to complete the Work of the Section.
- C. Provide additional Work and materials required by local authorities at no extra cost to Owner.
- D. Contractor shall provide all permits, applications, licenses, and other qualifications to complete work at no additional cost to owner.
- E. Reference Standards: American Society for Testing and Materials, Annual Book of ASTM Standards, latest edition.
- F. Related work: Section 329300 – Plants, Soil, & Sod

1.2 CONTRACTS

- A. Irrigation Work to a single firm specializing in irrigation installation, acceptable to Landscape Architect.

1.3 CODES AND STANDARDS

- A. Perform Irrigation Work in compliance with applicable requirements of governing authorities having jurisdiction. County regulations supersede these specifications. Notify Landscape Architect in writing of all discrepancies immediately.

1.4 DO NOT MAKE SUBSTITUTIONS

- A. If Contractor desires to make substitutions of materials, sufficient descriptive literature and material samples must be furnished to establish the material as an equal substitute. In addition, Contractor must state his reasons for desiring substitute materials. Submit this request and information to Landscape Architect.

1.5 APPROVAL AND SELECTION MATERIALS AND WORK

- A. The selection of all materials and execution of all operations required under the Drawings and Specifications is subject to the approval of Owner and Landscape Architect. They have the right to reject any and all materials and any and all Work which, in their opinion, does not meet requirements of the Contract Documents at any state of operations. Contractor to remove rejected Work and or materials from Project Site and replace promptly.
- B. “As-Built” Drawings: Any changes in layout and/or arrangements of the proposed irrigation system, or any other differences between proposed system and actual installed conditions are to be recorded by Irrigation Contractor in the form of an “As-Built” Drawings are to be clearly and neatly drawn on CAD drawing of original design provided by Landscape Architect. Provide Owner and Landscape Architect with a reproducible copy of the “As-Built” Drawings before Work under this Contract will be considered for acceptance. All automatic and manual valves, hose bibs or quick couplers and wire

splice shall be shown with actual dimensions to reference points so they may be located easily in the field. Submittal of approved “As-Built” Drawings will preclude any Application for Final Payment by Contractor.

- C. Delivery, Storage and Handling: Deliver material and equipment in such a manner as to not damage parts or decrease the useful life of equipment.
- D. Store materials away from detrimental elements. Coordinate with General Contractor to secure a safe staging area.
- E. Handle, load, unload, stack, and transport materials for irrigation system carefully to avoid damage. Handle pipe in accordance with Manufacturer recommendations.

1.6 VERIFY TAP

- A. Test water conditions as they exist immediately down stream from tap: If they do not meet design demands, notify Landscape Architect immediately of existing conditions.
- B. The irrigation system is designed to operate under the following conditions: a minimum of 60 psi of water pressure at tap and at least 45gpm available water supply tap & meter by Irrigation Contractor.
- C. Job Conditions: Insurance on irrigation materials or equipment stored or installed as the responsibility of Irrigation Contractor. Such insurance shall cover fire, theft, and vandalism. Should Contractor elect not to provide for such insurance, he will in no way hold Owner responsible for any losses incurred by the aforementioned acts. The Contractor is responsible for all costs incurred in replacing damaged or stolen materials.
- D. Obtain all required permits and pay all required fees, at no additional cost to Owner. Any penalties imposed due to failure to obtain permits or pay fees are the responsibility of the Contractor.
- E. Provide and maintain all passageways, guard fences, warning lights and other protection devices required by local authorities.
- F. Existing site improvements shall be performed in a manner which will avoid possible damage. The Contractor is responsible for any damage of a mechanical nature as well as damage resulting from leaks in irrigation system whether due to negligence or otherwise.
- G. Damages resulting from irrigation installation to Work of other trades must be repaired at the expense of Contractor in a timely fashion.
- H. Make adjustments to system layout as may be required and requested to provide complete coverage at no additional cost to Owner.
- I. Keep project site clean and orderly at all times during construction.

1.7 WARRANTY

- A. All Work for a period of one year, starting on Date of Substantial Completion, against defects in material, equipment, Workmanship, and any repair required resulting from leaks or other defects of workmanship, material, or equipment.
- B. Repair unsatisfactory conditions promptly at no cost to Owner.

- C. Emergency repairs may be made by Owner without relieving the Contractor of this warranty obligation.
- D. Contractor to repair settling of backfilled trenches occurring during warranty period, including restoration of damaged plantings, paving or improvements resulting from settling of trenches or repair operations.
- E. Respond to Owner's request for repair Work within ten days. If not, Owner may proceed with such necessary repairs at Contractor's expense. In addition, Contractor shall be held responsible for replacement of any plant material (tree, shrubs, sod, or seed) which becomes damaged or dies due to a lack of water during periods in which irrigation system is inoperable.

PART 2 PRODUCTS

2.1 SUMMARY

- A. Specific requirements concerning the various materials and arrangements which are safe to be installed are shown on drawings.

2.2 QUALITY AND SIZE

- A. Material specified by name and/or model number in the Specifications, on the site or detailed drawings are used for the purpose of identification of materials and to insure specific use of that material in the construction of the system. No substitutions will be permitted without approval. (See Substitutions).
- B. Plastic pipe for all main lines is schedule 40 PVC while laterals 1 ½" size and over is Class 200 PVC Type 1120 or 1220 as manufactured Cabot, John-Mansville (or approved equal) unless otherwise specified herein or on the drawings. All pipe, 1" size and less, is Class 160.
- C. PVC pipe is to be continuously marked with Manufacturer's identification, type, class, and size and installed with these markings on the top of the pipe.
- D. All fittings should be Schedule 40 PVC Type 1, of domestic manufacture and identified as to pressure rating or schedule.
- E. Solvent Weld: Solvent weld for PVC pipe over 20' length must be installed with standard 20' length sections. Unnecessary joints or couplings are not acceptable.
- F. Risers: Provide threaded Schedule 80 PVC risers. All risers above grade to be either dark gray or black PVC pipe.
- G. Electric Wiring: All 110-volt AC wiring to controller must consist of three wires: one black, one white and one ground. Electrical service to be provided by General Contractor unless otherwise directed by Owner.
- H. All splices in controller wiring shall be waterproofed by using Rainbird "Snap-Tite" wire connectors.
- I. All control wiring shall be 24-volt solid wire U>L> approved for direct burial in ground. Minimum wire size: 14 gauge.

- J. All control wiring and wiring connections from controller to valves shall be included in this contract.
- K. Sprinkler Heads: Provide as indicated on the plan. Heads perform to Manufacturer's specifications concerning radius of throw and gallon at given pressure.
- L. Automatic Controller: Is to be installed in the location schematically shown on drawings but identified by owner's representative in the field. The controller location will be accessible as shown on drawing for maintenance. Provide for the possibility of making minor timing adjustments to the controller in the field.
- M. Provide controller specified on drawing, fully automatic capability as well as manual operation of the system.
- N. Provide controller specified on drawing which operates on a minimum of 110 volts AC power input and is capable of operation of 24-volt AC electric remote-control valves, with a reset circuit breaker to protect from overload. Contractor is responsible for connection to 100V AC power to controller.

2.3 STATIONS

- A. Each station shall have a time setting knob, which can be set for variable timing in increments from 6 to 60 minutes or set to omit the station from irrigation cycle.

2.4 THE CONTROLLER

- A. The irrigation system shall be as specified on the drawings.

2.5 WATER METER

- A. Type approved by City where shown on drawing. Verify location with owner's representative in the field.
- B. Costs of irrigation water meter(s) shall be included in the contractors bid.

2.6 BACKFLOW PREVENTER

- A. Submit Double Check Assembly Backflow Preventer cut sheets for approval. The backflow preventer is a double check valve assembly type, capable of having a flow rate of 80 gpm, with a pressure loss not to exceed 5 psi and suitable for supply up to 150 psi. The backflow preventer body to be bronze, internal parts stainless steel and check valve assemblies with tight seating rubber. The backflow preventer assembly must include two-gauge valves for isolating unit and two ball valve test clocks for testing unit to insure proper operation.

2.7 PRESSURE REGULATOR

- A. Provide Wilkins #600 or equal. Install outside of the building for easy access and adjustment.
- B. Mastervalue: Rainbird # electric remote control valve w/brass body and bonnet. Valve shall be wired to open and close with each circuit valve. Size based on mainline.

2.8 VALVE BOXES

- A. Ametek 12” rectangular valve box with cover or jumbo mechanical box with cover and Ametek 10” round valve box with cover as indicated on drawings. Place a minimum of 6” depth of gravel under each valve box, meter, pressure regulator and backflow preventer box.

2.9 SLEEVES

- A. Size and type as indicated on drawings.

2.10 HOSE BIBS

- A. Hose bibs shall have an all-cast brass or bronze body. Hose bibs to be ¾” inside diameter and shall be installed below grade in Ametek 12” x 18” valve boxes. The cover over hose bib boxes shall be clearly marked with “non-potable water”.

2.11 CONTROL VALVES

- A. Provide Rainbird Electric Remote-Control Valve (size as indicated on Plan). Valve to conform to Manufacturer’s Specifications concerning performance and at a given pressure.

2.12 SURGE PROTECTION

- A. Provide General Electric Lightning Arrestor #GL 15 CC B 007 for controllers not equipped with primary surge protection.
- B. Provide secondary surge protection installed on the 24V AC valve control wiring for systems controlling 24V AC solenoid operated valves.
- C. The Irrigation Contractor is responsible for determining whether the above-mentioned surge protection equipment is provided for in controller as a “built-in” unit or if it must be supplied and installed separately.

2.13 ISOLATION VALVES

- A. Provide all BALL valves for isolation purposes allowing full diameter opening when in full open Position. See Contract Drawings.
- B. Manually operated valves shall be same size as mainline.

2.14 AUTOMATIC DRAIN VALVES

- A. Install at low point for each lateral line “Rainbird 16AP” drain valve in gravel sump 12” x 12” in size and with a minimum of 18” of cover over sump. Miscellaneous System Components: Providerisers, reducers, couplings, adapters, fittings as necessary to complete irrigation system.

PART 3 EXECUTION

3.1 SUMMARY

- A. Provide a competent superintendent and necessary assistants on the job while Work is progress. The Superintendent represents Contractor in all functions, and directives given to him by Owner are binding as if given to Contractor in person.
- B. During the installation Landscape Architect may make regular site visits and reject any Work and materials which do not meet the Standards called for in Contract Documents. Rejected work must be promptly corrected and no time extension will be allowed for this reason.

3.2 INSPECTION

- A. Inspect project area prior to start of Work to determine that all site conditions are acceptable for irrigation Work to begin. Inform Landscape Architect of unsuitable conditions. Do not proceed with installation of irrigation system until unsatisfactory conditions have been corrected in a manner acceptable to installer.

3.3 PREPARATION

- A. Flag all existing underground utilities prior to trenching and/or boring operations. Obtain utility locations from Owner and/or General Contractor and Utilize utility locating services when necessary.

3.4 EXCAVATION

- A. All excavation is unclassified and includes all materials encountered.
- B. Prior to excavation, remove sod, preserve, and replace after backfilling is completed.
- C. After excavation and backfilling is completed, regard trenched area consistent with surrounding area and re-establish with 100 percent pure of type grass existing. Maintain as necessary for establishment and survival of grass.
- D. Backfill material to be free from rock, large stones and other unsuitable substances which could damage the pipe or create unusual settling problems. Back fill in 6" layers and tamp after each layer to prevent excessive settling.
- E. Backfill trenches containing plastic pipe when pipe is cool to avoid excessive contraction in cold weather. Such backfilling can be done in early morning hours or pipe may be water cooled prior to backfilling procedures.
- F. Backfill material evenly in lifts not to exceed 6" and compact to 100 percent of maximum density.
- G. Contractor is responsible for establishing compaction in trenches equal to or exceeding overall compaction of paving base.
- H. Minimum depth of cover of all pipe is as follows:
 - $\frac{3}{4}$ " – 1" pipe – minimum depth cover is 12"
 - 1 $\frac{1}{2}$ " – 1 $\frac{1}{2}$ " pipe – minimum depth cover is 18".

3.5 SLEEVING

- A. Location of sleeving shown on plans is schematic. Sleeving installation shall make adjustments necessary to accommodate existing vegetation, utilities, and other existing conditions. Repair of damage to existing utilities, structures or other construction resulting from installation of sleeves is the responsibility of Contractor.
- C. Install PVC sleeves according to detail.

3.6 PIPE JOINTS

- A. Flow Manufacturer's Recommendation.
- B. Solvent weld PVC pipe, assemble according to Manufacturer's Recommendations, using appropriate PVC pipe cleaner/primer and solvent cement.
- C. PVC to metal connection, Work metal connection first then use Teflon pipe fitting tape on thread PVC to metal joints. Use only light wrench pressure.
- D. Main line shall be installed according to Manufacturer's Recommendations.

3.7 PIPE AND FITTINGS

- A. Install according to Manufacturer's Recommendations including snaking-in of PVC pipe to prevent excessive strain when contracting in cold weather. Solvent weld fittings must conform to Schedule 40 or Schedule 80 PVC dimensions and specifications for solvent weld fittings and as manufactured by Lasco, Inc.

- B. Lateral lines and risers shall be as follows:

Install according to Manufacturer's Recommendations using standard techniques.

Combine lateral lines and main supply lines in common trenches wherever possible with specified minimum depth of coverage over all pipe (see Backfilling).

Install riser such that no excessive movement occurs while sprinkler head is in operation.

Height of risers to be in accordance with planned and existing plant material. Height of all risers is subject to approval of Landscape Architect. Exchange of 4" pop-up to 12" high pop-in field by Landscape Architect is incidental.

Plug lines immediately upon installation to minimize infiltration of foreign matter.

Flush lateral lines and risers prior to installation of sprinkler heads.

Above ground risers must be dark gray or black in color.

3.8 SPRINKLER HEADS

- A. Low pop-up sprinkler heads shall be installed in such a manner that tip is 1" above finished grade. Where finish grade has not been established, extend a riser a minimum of 12" above existing grade to mark location of head. After finish grade is established, install heads at specified height on trip elbow swing joint, no flex pipe will be accepted.
- B. High pop-up heads: High pop-up shrub heads shall have the finished height determined by Landscape Architect.

- C. Backfill around sprinkler head assembly in such a manner that sprinkler head is stabilized so that no lateral motion is exhibited during operation.
- D. Sprinkler Heads on Risers: Sprinkler heads on risers should be maintained on a schedule 80 PVC riser coupled by a Schedule 40 F.I.P.T. coupling (Lasco #420007) to polyethylene riser first out of lateral fitting. Height of all heads in bed areas to be determined in the field by Landscape Architect. (Riser heights may also be achieved by use of approved pvc extensions of head manufacturer)
- E. Install control wire in orderly fashion, locate in main line trench. Bundle wires together and tape at 10' intervals. Position wires under main line.
- F. Allow for contraction of wires by providing looped slack at directional changes in supply line.
- G. Keep wire splices to a minimum. All splices shall be waterproofed by using "Rainbird Snap-tite" wire connectors. All splice locations to be indicated on "as-built drawings".
- H. Pass Wires under existing or future paving, construction, etc. through PVC sleeves provided by (Irrigation Contractor/General Contractor).
- I. Control Equipment: Install automatic valves and controller according to Manufacturer's Recommendations. Appropriate locations are shown on the drawings.
- J. Valve Boxes: All valves are to be housed in valve boxes. Install according to Manufacturer's recommendations and according to details. Position boxes at a height that will not cause them to interfere with maintenance machinery (e.g., mowers) and such that soil and mulch do not wash into the box. Locate all valve boxes within plant bed areas wherever possible.
- K. Install surge protection equipment on primary (110 VAC) power lines. Connect each surge protect unit to at least on 5/8" diameter by 9' long copper clad grounding electrode driven into the soil to its full depth. Place electrodes no closer than 2' from controller cabinet or any control or power wire. Be consistent in locating ground rods throughout installation with respect to controller position and not locations on "As-Built" Drawings.
- L. Ground wire between surge protection device and grounding electrode to be single strand bare copper wire at least one size greater than wire supplying power to control unit. Route ground wire away from power and control wires where possible.
- M. When it is necessary to pass through controller cabinet wall, use two #L-70 copper grounding lugs and brass bolt as noted in detailed drawings. Use #WE 5/8" ground rod clamp (single piece and bolt) to make connection between ground rod a minimum of 10". Cover the top of rod and clamp with a Toro #850-00 cover with lid at grade level.
- N. Balancing and Adjusting: Balance and adjust the various components of system so that overall operation of the system is most efficient. This includes synchronization of controllers, adjustment to pressure regulators, part circle sprinkler heads and individual station adjustments on controllers. The Contractor has the right to call in the Designer or Owner's Representative to aid in balancing and adjustment of system.

3.9 OPERATIONAL TESTING

- A. Upon completion of irrigation system and after head installation, test entire system for proper operation. Flush all air from system and check components for proper operation.

3.10 "AS-BUILT" DRAWINGS

- A. "As-Built" Drawings are to include locations of all wire splices, valves (automatic and manual) with triangulated measurements to each location as well as any deviations in location of piping and heads as represented by Contract Documents.
- B. A set of "As-Built" Drawings are to be provided by the contractor to the Architect or Landscape Architect in order to receive written substantial completion for this scope of work.

3.11 OWNER ORIENTATION

- A. Upon completion of Work and final acceptance by Owner and Landscape Architect, Contractor is responsible for orientation of maintenance personnel in the operation, maintenance, and repair of system. Furnish copies of all available parts lists, trouble shooting lists and specification sheets to Owner prior to final payment.
- B. Set initial watering schedules and programming on automatic controllers at the direction of Landscape Architect. Changes in schedules and programming and instructions on how to make such changes is the responsibility of Landscape Architect.

3.12 WINTERIZING THE SYSTEM

- A. If Owner requires, irrigation piping must be winterized by first blowing system clear of water using compressed air (80 psi minimum) admitted into piping at a quick coupling valve or hose bib located at a higher elevation on the system piping. Activate individual zones, higher zones first, then proceed successively through the system towards lower elevations. Proceed through all zones twice. The air compressor used to winterize system must have an engine separate from compressor tanks to prevent high temperature air from being injected directly into PVC piping.

3.13 CLEAN-UP

- A. During Irrigation Work, keep project site clean and orderly. Upon completion of Work, clear grounds of debris, superfluous materials, and all equipment. Remove from site to the satisfaction of Landscape Architect and Owner.

3.14 PROTECTION

- A. Protect Irrigation Work and materials from damage due to irrigation operations, operations by other contractors, trades, and trespassers. Maintain protection until Date of Substantial completion.
- B. Cover all openings into system as it is being installed to prevent obstructions in pipe and breakage, misuse, or disfigurement of equipment.
- C. Contractor is responsible for theft of equipment and material at job site before, during and after installation, until Date of Substantial Completion of the Work in total.

3.15 INSPECTION AND ACCEPTANCE

- A. Upon completion of Work, notify Landscape Architect and Owner at least three days prior to requested Date of Inspection for Substantial Completion. Prior to contacting Landscape Architect for the purpose of demonstrating all or any part of the system, thoroughly test the system for proper operation and make adjustments and replace any defective parts prior to inspection for Substantial Completion. Where inspected irrigation Work does not comply with requirements, replace rejected Work promptly, within two weeks of inspection. In unusual circumstances, a longer time period may be granted by Owner. If such replacements are not completed within time specified, Contractor may be considered to be in default of Contract and Owner may use Contract Retainage to hire other Contractors to finish the Work.

PART 4 ACCEPTANCE AND GUARANTEE

4.1 SUMMARY

- A. Substantial Completion: Submit written requests for inspection for Substantial Completion to Landscape Architect at least three calendar days prior to anticipated Date of Inspection and Testing. Substantial Completion cannot be granted and at the same time no further applications for payment shall be approved for more than 85% of contract until there has first been a walk-thru for head coverage at which time a “punch list” will be written consisting of items to be addressed and corrected by Contractor immediately. Depending on the extent of the Work on the “punch list”, the Landscape Architect will determine the job to be Substantially Complete or pending the completion of the “punch list”.
- B. Submit record drawings and maintenance manuals to Landscape Architect with written request for inspection.
- D. Review “punch list” Work jointly with Owner and Landscape Architect for Substantial Completion of total (contract) Work. (See “General Conditions”, Article No. 9).
- E. Upon satisfactory completion of repairs and replacements and completion of “As-Built” drawings, Landscape Architect and Owner will verify system for Substantial Completion and issue AIA Certificate of Substantial Completion if all items on “punch list” have been completed. If necessary, another “punch list” will be written to itemize any deficiencies still existing and will be attached to AIA Certificate. Contractor shall complete all “punch list” items, if possible, within 30 days while continuing maintenance.

4.2 DATE OF SUBSTANTIAL COMPLETION

- A. Date of Substantial Completion will constitute beginning Date of One-Year Guarantee. This Date also constitutes the beginning of the warranty responsibilities and acceptance by Owner and Landscape Architect.

4.3 GUARANTEE

- A. All Work, products, equipment, and materials for one year, beginning at Date of Substantial Completion as per (AIA Certificate of Substantial Completion/written letter of notification).
- B. Make good any damage, loss, destruction, or failure. Repairs and replacements shall be done promptly and at no additional cost to Owner.

- C. Repair damage to grade, plants and other Work or property, as necessary.
- D. If replacements are not acceptable during or at end of Guarantee Period, Owner may elect either subsequent replacement or credit. Replacement products shall have a similar one-year guarantee from time of replacement.
- E. Guarantee applies to all unacceptable conditions or losses with exception of Master Irrigation Specifications

PART 5.0 METHOD OF MEASUREMENT

5.1 METHOD OF MEASUREMENT

- A. The irrigation system shall be measured per these specifications and plans as a lump sum pay item.

PART 6.0 PAYMENT

6.1 PAYMENT

- A. The Irrigation Pay Item shall be considered complete and shall include all material, equipment, labor, METERS, installation costs, overhead and profit. Bidder shall verify quantities by his own take-off from the Drawings and notify the Landscape Architect of discrepancies before submitting his Bid.

END OF SECTION 328400

SECTION 329300 – PLANTS, SOIL, & SOD

PART 1 GENERAL

1.1 SUMMARY

- A. Extent of the planting is shown on the drawings and in the schedules.
- B. Provide all labor, materials, and equipment required by or referenced from the drawings and specifications to complete the work of this section.
- C. Verify plant count from plan and provide and install all plant material on plan unless site conditions prohibit.
- D. All plants shall conform to or surpass minimum quality standards as defined by the American Association of Nurserymen, current edition of American Standards for Nursery Stock published by American Association of Nurserymen, Inc. and in addition shall conform to sizes and descriptions in the plant list.
- E. Related work: Section 328400 – Planting Irrigation

1.2 SUBSTITUTION

- A. Substitution from the specified plant list will be accepted only when satisfactory evidence in writing is submitted to the Landscape architect, showing that the plant material is not available.
- B. Requests for approval of substitute plant material shall include common and botanical names and the size of substitute material.
- C. Only those substitutions of at least equivalent size and having essential characteristics similar to the originally specified material will be approved. Acceptance or rejection of substitute plant material will be issued in writing by the Landscape Architect.

1.3 APPROVAL AND SELECTION OF MATERIALS AND WORK

- A. The selection of all materials and the execution of all operations required under the Drawings and Specifications are subject to the approval of the Owner and Landscape Architect. They have the right to reject any and all materials and any and all work, which in their opinion, does not meet the requirements of the Contract Documents at any stage of the operations. Remove rejected Work and or materials from Project Site and replace promptly at no additional cost to the Owner.

1.4 QUALITY ASSURANCE

- A. The landscape installer shall be qualified with work resulting in successful plant establishment.
- B. The installer is required to maintain an experienced full-time supervisor on project site when planting is in progress.
- C. Topsoil analysis shall be furnished by Mississippi State University Extension Center (Mailing Address P.O. Drawer "Z", Gulfport, MS 39502-0045) Contact Information Phone 228-865-4227, Fax: 228-868-1470 Email: harrison@ext.msstate.edu (or an equal),

stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; (sodium absorption ration;) deleterious material; pH; and mineral and plant-nutrient content of topsoil.

- D. A report of suitability of topsoil shall be furnished for lawn growth stating the recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.
- E. The following codes and standards shall be observed:
 - 1. State and Federal laws, including for disease and insect control.
 - 2. Requirements of authorities having jurisdiction.
- F. A Pre-installation Conference shall be conducted 30 days prior to construction. The General contractor shall schedule this meeting to include the landscape contractor, irrigation contractor, Landscape Architect, and any other parties participating in this contract.

1.5 WORKMANSHIP

- A. Install all plant materials neatly.
- B. Make minor adjustments to layout as may be required and requested by Landscape Architect at no additional cost to the Owner.
- C. Coordinate delivery of all plant material with time of installation to prevent any plant material from being stockpiled on site longer than 24 hours.
- D. Deliver materials in such manner as to not damage or decrease the health and vigor of the plant materials. Store materials away from detrimental elements. Coordinate with General Contractor to secure a safe staging area.
- E. Handle, load, unload, and transport materials carefully to avoid damage.
- F. Maintain and protect plant materials as necessary to insure health and vigor.

1.6 GUARANTEE

- A. Guarantee all plant materials and lawn areas for one year from the date of substantial completion. Contractor shall replace plants that fail to grow properly with plants as originally specified at the earliest practical date following plant failure, without additional charges to the Owner.
- B. Replacement materials will be guaranteed for one year from the date of replacement.
- C. The Contractor shall not be responsible for replacing plants which are damaged by abuse or improper maintenance by Owner as reported by Contractor outlined below or by acts of nature occurring after acceptance.
- D. Acts of nature may include but may not be limited to high winds of hurricane or tornado force, sleet, hail, freezing rain and extreme cold (as determined by the Landscape Architect). Contractor agrees to replace losses due to Acts of Nature at twenty percent (20%) less than the original contract price for the damaged work.

1.7 CONTRACTOR'S PERIODIC INSPECTION

- A. During guarantee period, Contractor shall make periodic inspections of the project to satisfy him that maintenance by the Owner is adequate.
- B. Any methods or products which he deems not normal or detrimental to good plant growth shall be reported to the Owner in writing.
- C. Failure to inspect and report shall be interpreted as approval and the Contractor shall be held responsible for any and all replacements.

1.8 SOIL TESTING

- A. Contractor shall have soil tested by suitable laboratory chosen by the Contractor and subject to written approval of the Landscape Architect.
- B. Soil test shall be completed in all planting areas to determine lime and fertilizer requirements. Submit test results to Landscape Architect for approval. Contractor shall adjust pH and fertility based upon results. No addition to or placement of soil is to be done prior to initial soil test report approval.

PART 2 PRODUCTS

2.1 TOPSOIL

- A. Topsoil shall be fertile, friable, sandy loam and a natural surface soil obtained from well areas reviewed by Landscape Architect and possessing characteristics of representative soils in the project vicinity that produce heavy growths of crops, grass, or other vegetation.
- B. Topsoil shall be free of subsoil, brush, organic litter, or objectionable weeds, clay, clots, stumps, stones, roots, or other material harmful to plant growths or hindrance to planting or maintenance operations. Should regenerative materials be present in the soil, Contractor shall eradicate and remove such growth, both surface and root, which may appear in the imported material within one year following acceptance of the work.
- C. Topsoil shall not be handled in a frozen muddy condition. The acidity range shall be between 5.0 and 7.0 inclusive. The mechanical analysis of the soil shall be as follows:

Sieve Size	Percent Passing
1 inch mesh	99 - 100 percent
1/4-inch mesh	97 - 99 percent
No. 100 mesh	40 - 60 percent
No. 200 mesh	20 - 40 percent

- D. Topsoil, regardless of the source, shall meet all requirements of the paragraph above.
- E. Stockpile material that does not meet the requirements may, at the option of the contractor, be improved by screening and the addition of organic matter and chemical admixtures.

2.2 PLANTING SOIL MIXTURE

- A. Provide soil mix amended as per laboratory recommendations. Some more specific descriptions may be given on the drawings for special planting of trees. Basic planting soil mix consists of:

40% topsoil (as described Above)
60% organic planting mix (submit sample for approval)

- B. The components shall be thoroughly mixed to uniform consistency by hand or machine methods.

2.6 TREES

- A. All large deciduous shade trees and ornamental trees are to be field grown from rooted cuttings true to variety and not grafted material. No grafted material will be accepted for the initial installation or as guarantee replacement material.
- B. Orders for Plant Materials - Submit to Landscape Architect within 30 days from date contract is awarded to the Contractor.
- C. Contractor will submit confirmed orders within ten days of tagging. Contractor is responsible for payment of deposits.

2.7 ORDERS FOR PLANT MATERIALS

- A. Submit to Landscape Architect within 30 days from date of contract is awarded to General contractor confirmed orders for material from approved growers (listed on plant schedule). Contractor is responsible for payment of deposits required by approved growers.

2.8 FERTILIZER

- A. Fertilizer for all trees, plants and ground covers shall be Milorganite delivered to the site in unopened containers.
- B. Fertilize all areas according to the manufacturer's recommended rates in accordance with the monthly maintenance guideline herein.
- C. Cultivate and water beds or pits thoroughly after application.
- D. Adjust fertilizer in accordance with interim soil test reports.

2.9 FERTILIZER FOR SOD

- A. Fertilizer for sod shall be Milorganite fertilizer as per manufacturer's recommended rates.
- B. Fertilizer shall be uniform in composition, dry and free flowing, and shall be delivered to the site in the original, unopened container, bearing the Manufacturer's guaranteed analysis. Fertilizer shall not have been exposed to weather prior to delivery to the site. After delivery until used, it shall be completely protected at all times. It shall not be stored in direct contact with the ground.

2.10 PLANTS

- A. All plants shall conform to or surpass minimum quality standards as defined by the American Association of Nurserymen (AAN), current edition of American Standard for Nursery Stock, published by the AAN, Inc. and in addition, shall conform to sizes and descriptions in the plant list.

2.11 CERTIFICATES OF INSPECTION FOR PLANT MATERIAL

- A. All necessary inspection certificates shall be supplied to the Landscape Architect's representative for each shipment of plant material, as required by law. Certificates showing source of origin shall be filed with Landscape Architect prior to acceptance of the material.

2.12 INSPECTION

- A. All plant materials shall be subject to inspection and approval. The Landscape Architect reserves the right to reject any and all plants which fail to meet this specification at any point during the installation of the job. All rejected materials shall be promptly removed from the site by the Contractor at no additional cost to the owner.

2.13 QUALITY AND SIZE

- A. All plant materials furnished shall be well branched, proportioned width to height, of normal habit, sound, healthy and vigorous in growth. The minimum acceptable sizes of plants shall be measured before pruning with branches in normal position and shall conform to measurements specified. Plants used where symmetry is required shall be matched as closely as possible. Plants shall meet all requirements as listed in the plant list.

2.14 SOURCE OF PLANTS

- A. Plants shall be field nursery, container grown or collected material subject to the requirements of the Specifications.

2.15 FIELD TAGGED PLANTS

- A. All trees are to be located and tagged by the Contractor. The Landscape Architect retains the right to refuse all plant material that does not meet the specifications identified on the drawing.

2.16 INSECTS, PESTS AND PLANT DISEASES

- A. All plants shall be of healthy stock, free from disease, insects, eggs, larvae, and parasites of an objectionable or damaging nature.

2.17 SUBSTITUTIONS

- A. Substitution from the specified list will be accepted only when satisfactory evidence in writing is submitted to the Landscape Architect, showing that the plant specified is not available. Requests for approval of substitute material shall include common and botanical names and size of plant material. Only those substitutions of at least equivalent size and having the essential characteristics similar to the originally specified material will

be approved. The Landscape Architect will issue acceptance or rejection of substitute plant material in writing.

- B. Balled and burlapped plant materials are to be wrapped with organic wrapping burlap only. Synthetic material will not be accepted. Remove all nursery loading straps once plant material is placed in the pit.
- C. Stakes for supporting trees shall be sound timber, straight, sized as shown in planting details and of sufficient length to adequately support the plant. All visible surfaces shall be painted flat black.
- D. Deadmen or stakes for anchoring guy wires in the ground shall be of size, material, and strength adequate to hold guy taut and maintain tree firmly in an upright position (see plan sections).
- E. Wire shall be as shown on plans applicable sections for guying.

2.18 MULCH

- A. The approved mulch shall be clean, fresh, free of noxious weed, seed, fire ants, Japanese beetles and/or fringed beetles. On slopes pine straw mulch shall be used.

2.19 EROSION-CONTROL MATERIALS (PLANTING SLOPES GREATER THAN 3:1)

- A. Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended 6" steel wire staples.
- B. Fiber Mesh: Biodegradable twisted jute or spun-coir mesh, 0.92 lb/sq yd minimum, with 50 to 65% open area. Include manufacturer's recommended 6" steel wire staples.

2.20 SOD

- A. Sod shall be 100% specified grass, free of weeds, freshly dug.

2.21 LIME

- A. Ground dolomitic limestone not less than 85% total carbonates and magnesium, ground so that 50% passes 100-mesh sieve and 90% 20-mesh sieve.

PART 3 EXECUTION

3.1 LAYOUT OF MAJOR PLANTS

- A. Before commencing planting operations, location of major plants and outlines of areas to be planted shall be marked out on the ground, by the Contractor for approval by the Landscape Architect. Contact the Landscape Architect a minimum of 48 hours in advance of the anticipated review of the layout.

3.2 TIME AND PLANTING

- A. Planting operations shall be during favorable weather in which conditions are neither extremely cold or hot nor to the point that the risk of loss is too great. The Contractor shall inform the Landscape Architect of high risks due to weather.

3.3 PREPARATION OF PLANTING BEDS (See Planting Sections)

- A. Any planting bed that has an existing tree in it shall not be tilled. Each hole is to be hand dug. No major roots are to be harmed during the planting. If the tree is harmed, the Contractor will be held responsible.
- B. Grade will be brought to the level of the finished grade by the Contractor. This is to include debris removal and any grading required to bring the landscaping finished grade to the proper level for planting trees, shrubs, and ground covers. Contractor shall grade for proper drainage.
- C. Circular plant pits with vertical sides shall be dug by hand or machine methods for planting and transplanting of trees and shrubs.
- D. Shrub pit diameter shall be a minimum of one foot greater than the spread of the root mass.
- E. All transplanted material is to be replanted the same day it is dug or properly healed in and watered regularly to insure life.
- F. Test excavated plant pits to determine if sufficient drainage is present for proper plant survival.
- G. Fill the area between the pits, if the individual pits are arranged in a group, to the required grade with pine bark mulch 3" deep. Plant beds shall be neatly edged and kept free of weeds until the work is accepted.

3.4 EXCAVATION FOR PLANTING GROUND COVERS

- A. Ground cover beds shall be scarified by hand or machine method to a minimum depth of 18". Four inches of pine bark additive and 20 pounds per 1000 square feet of Trident Rootzone Humus (or approved equal organic fertilizer) shall be uniformly incorporated into the soil to the full 18" of minimum depth.

3.5 DRAINAGE TEST FOR TREES

- A. Tree pits shall be filled with water. If percolation is less than 100% within a period of twelve hours, drill an 8" auger to a depth of 2' below the bottom of the pit. Retest the pit. In case drainage is still unsatisfactory, notify the Landscape Architect in writing of the condition before planting the trees. Contractor is fully responsible for the warranty of the trees. If the tree is on a slope, provide a trench filled with stone and a 4" drainpipe to the point of nearest relief.
- B. Drainage Test for Plants and Ground Covers shall be spot tested to insure proper percolation.

- C. Balled and container plants shall be placed firmly upon scarified subgrade and backfilled with planting soil mixture. Remove all wire, cords, and burlap from the top of root ball. Hand tamp carefully around and under ball to fill all voids. Water during back filling. Form saucer from planting soil mixture in order to retain water.
- D. Gently loosen outer roots of container grown plants to encourage outward growth.
- E. Fertilizer shall be thoroughly mixed and soaked into the top 2" of soil for all plant pits.

3.6 TREE TRANSPORTATION

- A. The Contractor shall be responsible not only for the safe transportation of the plants to the site but also their condition upon arrival. Trees with abrasions of the bark, sun scalds, fresh cuts, or breaks of limbs which have not completely callused will be rejected. Trees which have been damaged during transit will be replaced by the Contractor at no additional cost. All plant unit costs will reflect all above listed specifications.

3.7 TREE TAGS

- A. All plants accepted at the nursery by the Landscape Architect shall be tagged with serialized self-locking tags. Trees delivered to the site without these tags or with broken tags will be rejected. The tags shall remain on the trees until the Contractor has been given instructions by the Landscape Architect for removal.

3.8 PRUNING DECIDUOUS TREES

- A. Deciduous trees and shrubs shall be pruned only to thin out heavy growth.
- B. Do not top or remove terminal growing point or leader of any plant.

3.9 TREE STAKING

- A. Stake or support trees as illustrated and described in the planting details on the drawings.

3.10 PREPARATION OF LAWN AREAS

- A. Grade will be brought to a level of 4" below finished grade by the General Contractor. The landscape contractor will spread 2-3" of topsoil, fine grading all lawn areas to finish grade. All areas shall have smooth and continual grade between the existing and fixed controls such as walks and curbs. Roll, scarify, rake and level as necessary to obtain true, even, and firm lawn surfaces. All finished grades shall meet approval of the Project Engineer before sodden or seeding operations begin.

3.11 AREAS TO RECEIVE SOD

- A. Grade will be brought to the level of the finished grade by the Landscape Contractor. The Landscape Contractor will be responsible for fine grading. This is to include debris removal and any grading required to bring the finished topsoil grade to the proper level for laying sod. Contractor shall fine grade as necessary for uniformity and drainage.
- C. On this grade spread specified fertilizer as per Manufacturer's recommendations and lime at a rate of 50 lbs. per 1000 square feet evenly over all areas to receive grass. A soil test shall be made prior to the beginning of fertilizing and liming, and the quantities of the lime and fertilizer shall be adjusted, if necessary, to achieve a pH of 6.0 to 7.0.

- D. Scarify prepared grade to depth of 6 inches, thoroughly incorporating fertilizer and lime into the top 6" of existing soil in all areas to be grassed. Caution shall be exercised to avoid damage to underground utilities. All building debris, vegetation, sticks and stones over 1 inch in any dimension shall be removed and the surface leveled and smoothed.

3.12 SODDING OPERATIONS

- A. Delivery of sod shall be scheduled so as to allow laying of sod without delay. No sod shall remain stacked longer than 24 hours. In the event that sod cannot be laid immediately upon delivery, Contractor shall lay sod on as designated site, to be approved by the Landscape Architect. No sod shall overlap, and it shall be lightly watered as necessary to keep moist.
- B. Lay sod when bed is not excessively wet or frozen, but when soil is moist for a depth of 4".
- C. Lay sod so that no voids occur. Sod shall be tamped and rolled by hand methods. The completed surface shall be true to finish grade and even and firm at all points.
- D. Do not move heavy objects over areas to be sodded after the soil has been prepared.
- E. A satisfactory stand is defined as a cover of living grass of specified species, after true leaves are formed in which no gaps larger than five (5) inches square occur.
- F. Areas determined by the Landscape Architect to be solid rock will be exempt from this requirement.

3.13 REMOVAL OF EXISTING GRASS

- A. The Contractor is to remove existing grass and weeds from all areas for planting and resodding as designated on the plans. The existing stands are to be removed to a maximum depth of 1" so as to not disturb existing tree roots where present in those areas.
- B. Aerate with a tined tiller to break up the upper 3" lightly not to damage tree roots. Pick up solids for discarding and cut cleanly any roots damaged.
- C. Spread a light layer of topsoil not more than 1" in depth over the aerated area and fine grade to meet acceptance by the Landscape Architect. Apply fertilizer and lime to these areas as specified previously under "Areas to receive Sod" or "Preparation of Planting Beds" whichever the case may be.

PART 4 CLEANUP AND PROTECTION

4.1 SUMMARY

- A. Keep Project Site clean and orderly during planting operations.
- B. Clear grounds of debris, superfluous materials, and all equipment upon completion of Work. Remove from site to the satisfaction of the Landscape Architect and Owner.

- C. Protect all work and materials from damage due to landscape operations and operations by other contractors, trades, and trespassers. Maintain protection until Date of Substantial Completion.
- D. Contractor is responsible for theft of equipment and material at the site before, during and after installation, until Date of Substantial Completion of Work in total.

PART 5 LANDSCAPE MAINTENANCE

5.1 SUMMARY

- A. Begin maintenance at commencement of Work of this Section and Continue until Substantial Completion and for thirty days after Substantial Completion of the project is issued, as part of Work of this section.
- B. Provide labor, materials, equipment and means for proper maintenance of all materials on this project.
- C. Contractor shall follow with maintenance methods described in these specifications.

5.2 SUPERVISION

- A. Contractor shall provide quality workmanship with qualified landscape professionals to conduct the work in a manor that is satisfactory to the client.
- B. The contractor shall have one point of contact for the client or client's representative to be able to reach out to if there is an issue that needs to be addressed.

5.3 MAINTENANCE OF TREES, SHRUBS, SOD, AND SEED

- A. Maintain all plants in a growing, well formed, healthy condition by watering, fertilizing, pruning, weeding, spraying, wrapping, straightening, replacement or by other necessary maintenance operations.

5.4 WATERING

- A. Monitor owner's automatic watering system and schedule for proper watering of all plant material.
- B. Advise Landscape Architect immediately in writing of recommended alterations due to weather or other conditions.
- C. Water landscaped (and sodded) areas not covered by automatic watering system as frequently as necessary to maintain proper moisture level, using the following schedule as a guide:
 - 1. Twice a month during March, April, May
 - 2. Once a week during June, July, August, September
 - 3. Seasonally adjust for Fall and Winter Months

5.5 FERTILIZING

- A. Apply four (3) times a year to trees, shrubs, ground cover, and sod as per manufacturer's recommended application rate.

5.6 MOWING

- A. Mow grass to a height of 2 to 2.5" when it reaches a height of 3", or as directed by Landscape Architect. Seeded and sodded lawns shall have at least one mowing before receiving Substantial Completion.

5.7 RESODDING

- A. Rework and re-sod areas which fail to show a uniform stand of grass. Perform work with the same kind of sod applied and repeated until all areas are covered with a uniform stand of grass.

5.8 RESEEDING

- A. Rework and seed areas which fail to show a uniform stand of grass. Perform work with the same kind of seed applied and repeated until all areas are covered with a uniform stand of grass.

5.9 SITE ANNUAL PLANTING

- A. Replace annual plantings according to schedule in Drawings. Blooming plants shall be replaced as necessary throughout specified Maintenance Period to maintain blooming condition.

5.10 PRUNING

- A. Remove dead wood as it becomes evident. Remove living portions of plants only at the direction of Landscape Architect.

5.11 WILT-PROOFING

- A. Apply approved anti-desiccant to all evergreen trees during last two weeks in October (except pines).

5.12 SPRAYING

- A. For each spraying combine approved insecticide and fungicide to provide maximum protection for all plant materials. Three sprays annually; in March, May, and August.

5.13 WEEDING

- A. Two applications (Spring and Fall) of chemical pre-emergent spray, approved. Two applications (during growing season) of chemical contact spray (Round-Up, by Monsanto, or approved equal). Every other week manually weed (by hand) during the time period reflected on the maintenance schedule (ref. plans); remove all visible weeds.

5.14 MULCHING

- A. Keep planting areas neat and uniformly mulched to specified depth on a continuous basis. In addition to replacing and re spreading mulch as necessitated during the maintenance period completely replenish mulch in all planting areas one time.

5.15 STRAIGHTENING

- A. Maintain plants in their stable upright position and at the proper grade by straightening and tightening staking and guying apparatus and as approved by the Landscape Architect.

5.16 CLEAN-UP

- A. Keep all planting areas neat, weeded and uniformly mulched on a continuous basis. Clean up adjacent walks and pavement where lettered as a result of maintenance operations, on a continuous basis.

PART 6 ACCEPTANCE AND GUARANTEE

6.1 SUBSTANTIAL COMPLETION

- A. Submit written requests for inspection for Substantial Completion to the Landscape Architect at least three calendar days prior to anticipated date of inspection and testing.
- B. Substantial Completion cannot be granted and at the same time no further applications for payment shall be for more than 85% of the Contract until there has been a walk - thru for planting at which time a "punch list" will be written consisting of items to be addressed and corrected by the Contractor immediately. Depending on the extent of work on the "punch list", the Landscape Architect will determine the job to be "substantially complete" or pending the completion of the "punch list".
- C. Submit Record Drawings and Maintenance manuals to the Landscape Architect with written request for inspection.
- D. Review the "punch list" work jointly with the Owner and Landscape Architect for Substantial Completion of the total (contract) work.
- E. Upon completion of repairs and replacements found necessary at the time of review, the Owner and Landscape Architect will confirm the date of Substantial Completion and issue the written notice of Substantial Completion if all items on the punch list have been completed. If necessary, another punch list will be written to itemize any deficiencies still existing and will be attached to the written notice of substantial completion. The contractor shall complete all "punch list" items within 30 days while continuing maintenance.
- F. The date of Substantial Completion will constitute the beginning date of the One - Year Guarantee. This date also constitutes the beginning of warranty responsibilities and acceptance by the Owner and Landscape Architect.

6.2 GUARANTEE

- A. All work, products, equipment, and materials for one year, beginning at the Date of Substantial Completion as per the written notice of Substantial Completion.

- B. Make good any damage, loss, destruction, or failure. Repairs and replacements shall be done promptly and at no additional cost to the Owner.
- C. Repair damage to grade, plants, and other work, as necessary.
- D. If the replacement is not acceptable during or at the end of the Guarantee Period, the Owner may elect either subsequent replacement or credit. Replacement products shall have a similar one-year guarantee from the time of replacement.
- E. Guarantee applies to all unacceptable conditions or losses with exception of those due to acts of nature, vandalism, or Owner neglect, as determined by Landscape Architect. Act of Nature includes, but may not be limited to, high winds of hurricane or tornado force, sleet, hail, freezing rain and extreme cold (as determined by Landscape Architect). Contractor agrees to replace losses due to Acts of Nature at (20%) less than original contract price for the damaged Work.

PART 7 METHOD OF MEASUREMENT

7.1 METHOD OF MEASUREMENT

- A. Plant material shall comply with these specifications and the plans in which each plant is listed and will be measured by the number of units of each kind of plant and size specified.
- B. Sod shall comply with these specifications and quantified by the plans. The units of sod shall be measured in square yards.

PART 8 PAYMENT

8.1 PAYMENT

- A. All of the landscape work described in these specifications and drawings shall be bid as lump sum. However, a schedule of values with unit costs for soil, bed prep, mulch, plant material, and sod shall be submitted as an attachment to the Landscape Contractor's bid.
- B. Bidder shall verify quantities by his own take-off from the Drawings and notify the Landscape Architect of discrepancies before submitting his Bid.
- C. Topsoil, Soil Amendments, Staking & Guying, Tree Wrapping, Mulching, and Watering during the maintenance period shall be considered a subsidiary obligation of the plant material installation and included in the bid.

END OF SECTION 329300

DIVISION 33 UTILITIES

SECTION 33 05 25 LOCATIONS OF EXISTING UTILITIES

PART 1 - GENERAL

1.1 SCOPE

A. Description of Work

1. Prior to performing excavation or demolition work on the job site the CONTRACTOR shall obtain all recorded locations of existing buried utilities as outlined herein.
2. Contact the User to provide exact location of utility before excavation or demolition work is started.
3. Attention is directed to the fact that there may be other lines in certain locations in addition to the recorded locations.

B. Related Work Specified Elsewhere

1. All utility work shall be in accordance with MAWSS (Mobile Area Water and Sewer System requirements. Refer to the Board of Water and Sewer Commissioners of the City of Mobile, Alabama Update of Standard Specifications including but not limited to as follows;
 - a. Section 11: Potable Water Utilities Standard Specifications
 - b. Section 12: Sanitary Sewer Standard Specifications
 - c. Section 13: Backfilling.

1.2 SUBMITTALS

- A. The CONTRACTOR shall furnish the Engineer a certification listing the names of the users whom he has contacted during course of construction.

PART 2 – PRODUCTS

2.1 NONE

PART 3 - EXECUTION

3.1 GENERAL

- A. It shall be the duty of each CONTRACTOR who intends to perform excavation or demolition work within the City to ascertain the exact location and type of users' lines which are located within the limits of work of this Contract.

3.2 OBTAINING LOCATION OF EXISTING USERS' LINES

- A. The CONTRACTOR shall obtain the list of users from any of the following sources:
 1. By inspection of the Contract Plans which show the approximate location of the user's facilities.
 2. Alabama one-call: 1-800-292-8525.

- B. The CONTRACTOR shall secure all necessary municipal permits relating to road occupancy prior to commencing excavation.
- C. Not less than three nor more than ten working days prior to the day of beginning such work, the CONTRACTOR shall notify each user of the CONTRACTOR's intent to perform such work at its site or sites. If a CONTRACTOR intends to perform work at multiple sites or over a large area, he shall take reasonable steps to work with users so that they may locate their facilities at a time reasonably in advance of the actual start of excavation or demolition work at each site.
- D. The following are the minimum cooperative steps which the CONTRACTOR shall take, either at or off the excavation or demolition site:
 - 1. Before the CONTRACTOR starts any demolition work in the area of a particular user's line, the CONTRACTOR shall ascertain from the User if the user wants to have a representative present during the demolition within this area. Additionally, the CONTRACTOR will comply with all standard regulations and necessary precautions as may be required by the User.
 - 2. Inform each operator, employed by him at the site of such work, of the information obtained by him as noted above.
 - 3. Report immediately to the user any break or leak on its lines, or dent, gouge, groove or other damage to such lines or to their coating or cathodic protection, made or discovered in the course of the excavation or demolition work.
 - 4. Alert immediately the occupants of premises as to any emergency that he may create or discover at or near such premises.
- E. The User may require additional cooperative steps be taken beyond those noted above depending on the circumstances of the time and/or location of this work.
- F. The CONTRACTOR shall exercise due care and take all reasonable steps necessary to avoid injury to or otherwise interfere with all lines where positions have been provided to the CONTRACTOR by the users. If insufficient information is available the CONTRACTOR shall employ prudent techniques, which may include hand-dug test holes, to ascertain the precise position of such facilities.

3.3 LOCATING LINES

- A. All recorded or unrecorded lines, shall be located on the ground with pipe locating equipment well ahead of the work at all times. All such locations shall be plainly marked by coded paint symbols on pavement or by marked stakes in the ground. Such locations shall be established at least 50 feet in advance of all trench excavation. All such location work shall be provided by the CONTRACTOR to the satisfaction of the Engineer at no extra cost.

END OF SECTION 33 05 25



MIMS PARK CONCESSION STAND & RESTROOMS

MOBILE, AL - PROJECT # PR-048-24B



SHEET INDEX	
SHEET	DESCRIPTION
D-100	DEMOLITION & EROSION CONTROL PLAN
C3	GRADING & DRAINAGE PLAN
C4	UTILITY PLAN
C5	CIVIL NOTES & DETAILS
E1.0	ELECTRICAL SPECIFICATIONS & ABBREVIATIONS
E2.0	ELECTRICAL LEGEND & NOTES
E3.0	EXISTING ELECTRICAL SITE PLAN
E3.1	NEW WORK ELECTRICAL SITE PLAN
E4.0	NEW WORK LIGHTING PLAN
E6.0	ELECTRICAL SCHEDULES & DETAILS
G1.0	ARCHITECTURAL ABBREVIATIONS & STANDARDS
G2.0	BUILDING CODE SUMMARY
G3.0	LIFE SAFETY PLAN
A1.1	ARCHITECTURAL FLOOR PLAN & FINISHES
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A1.3	CEILING & ROOF FINISH PLAN
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A5.1	DOOR & WINDOW DETAILS
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A6.1	FRAMING DETAILS
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A6.3	FRAMING DETAILS
S0.1	STRUCTURAL SPECIFICATIONS & STANDARDS
S0.2	STRUCTURAL ABBREVIATIONS & STANDARDS
S1.1	FOUNDATION LAYOUT PLAN
S1.2	SLAB ON GRADE LAYOUT PLAN
S1.3	CMU WALL PLAN
S1.4	PERIMETER GIRDER FRAMING PLAN
S1.5	ROOF FRAMING PLAN
S1.6	ROOF FRAMING PLAN
S1.7	STRUCTURAL SECTION ELEVATION PLANS
S3.1	STRUCTURAL DETAILS
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S3.3	STRUCTURAL DETAILS
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P1.0	PLUMBING SCHEDULE & NOTES
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M1.0	MECHANICAL NOTES & SCHEDULE
M2.0	HVAC PLAN
M3.0	HVAC DETAILS
H100	HARDSCAPE PLAN
H200	HARDSCAPE DETAILS
L100	LANDSCAPE PLAN

GENERAL NOTES:

1. PRIOR TO BIDDING, THE CONTRACTOR SHALL VISIT SITE AND THOROUGHLY FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS AND WITH THE CONTRACT DOCUMENTS ANY QUESTIONS OR DISCREPANCIES REGARDING THE NATURE OR INTENT OR THE WORK SHALL BE DIRECTED TO THE LANDSCAPE ARCHITECT PRIOR TO BIDDING.
2. ALL DEMOLITION AND REMOVAL WORK SHALL BE EXECUTED IN CONFORMANCE WITH ALL CODES AND ORDINANCES AS SET FORTH BY ALL GOVERNING AUTHORITIES.
3. CONTRACTOR IS RESPONSIBLE FOR ALL SAFETY ON THE PROJECT, AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO MAINTAIN SAFE WORKING CONDITIONS. SITE SHALL BE SECURED, AS REQUIRED, TO PREVENT UNAUTHORIZED ACCESS TO THE WORK.
4. CARE SHOULD BE TAKEN AT INTERFACE BETWEEN DEMOLITION AND EXISTING CONSTRUCTION TO REMAIN. THIS CARE IS TO AVOID ANY DAMAGE TO EXISTING CONSTRUCTION TO REMAIN, AND TO UTILITIES, WHICH SERVES THAT CONSTRUCTION. THE CONTRACTOR SHALL CORRECT ALL DAMAGE CAUSED BY HIS WORKMEN, AT NO ADDITIONAL COST TO THE OWNER.
5. THE CONTRACTOR SHALL NOTIFY, COORDINATE, SCHEDULE AND RECEIVE PERMISSION FROM THE OWNER PRIOR TO ANY SHUT DOWN OF THE SITE AND/OR BUILDING UTILITIES AS REQUIRED TO COMPLETE THE WORK. NOTIFICATION SHALL INCLUDE THE LENGTH OF TIME REQUIRED TO SHUT DOWN, LENGTH OF TIME SERVICE WILL BE DISCONNECTED, AND TIME REQUIRED TO RECONNECT SERVICES.
6. THE CONTRACTOR SHALL CONFORM TO CITY OF MOBILE REQUIREMENTS FOR THE PROTECTION OF ALL TREES TO REMAIN ON SITE.
7. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS BY CITY OF MOBILE, INCLUDING BUT NOT LIMITED TO SIGNAGE AND TREE TRIMMING/REMOVAL PERMITS.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MEANS AND METHODS, INCLUDING SHORING, BRACING, AND SEQUENCING NECESSARY FOR PROPER COMPLETION OF THE PROJECT.

STORMWATER EROSION CONTROL NOTE:

THE CONTRACTOR MUST OBTAIN AND SIGN A STORM WATER EROSION CONTROL AGREEMENT WITH THE CITY OF MOBILE. THE CONTRACTOR IS RESPONSIBLE FOR ABIDING BY ADEM REGULATIONS THROUGHOUT THE CONSTRUCTION OF THE PROJECT, AND MUST UNDERSTAND THAT THE CITY WILL ISSUE A STOP WORK ORDER AT ANY TIME THESE MEASURES ARE NOT IN COMPLIANCE UNTIL THE SITE IS IN COMPLIANCE. THE CONTRACTOR SHOULD OBTAIN A COPY OF THESE PRIOR TO BID, SO THAT REQUIREMENTS ARE KNOWN.

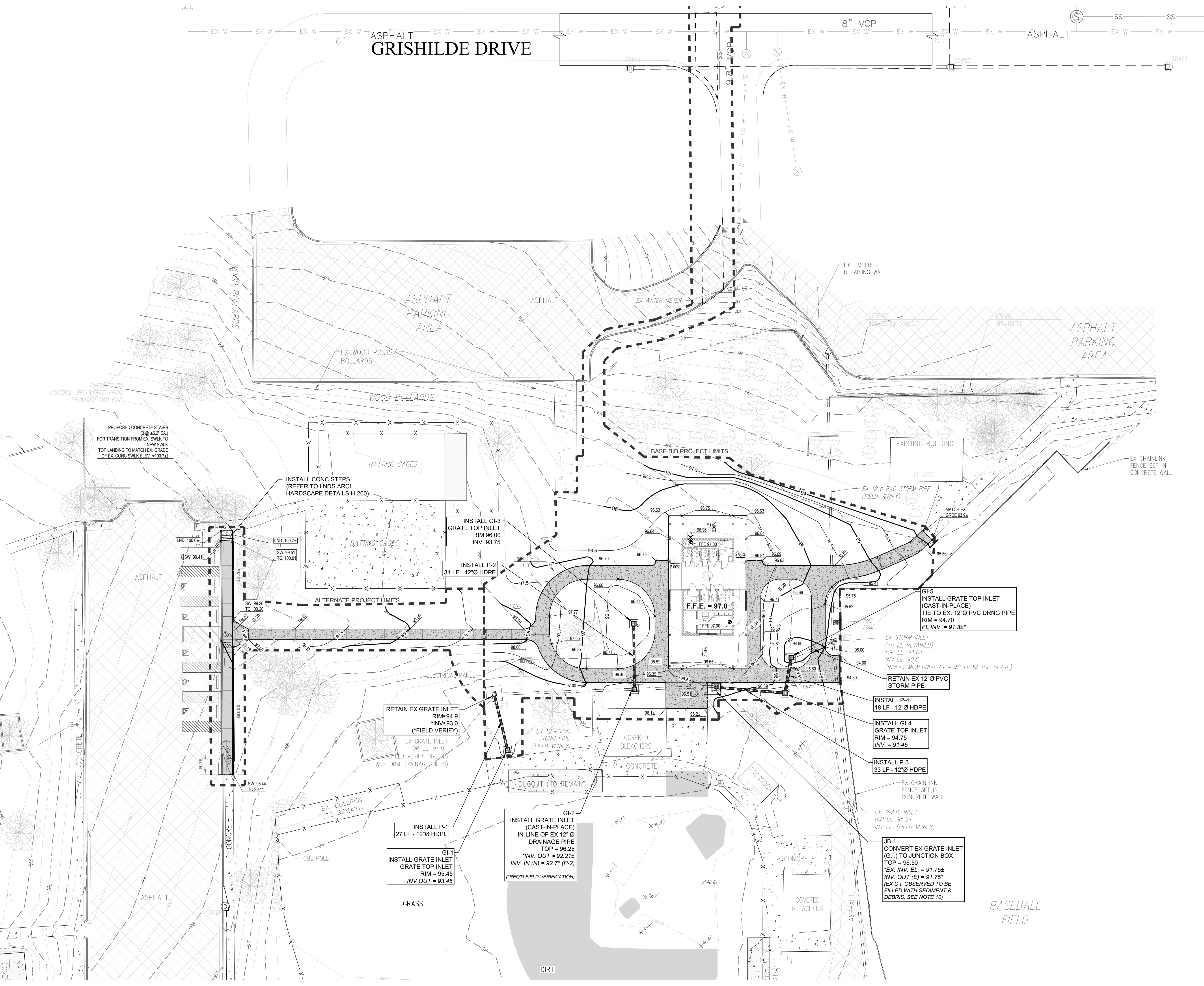
TRAFFIC CONTROL, SAFETY ITEMS:

CONTRACTOR SHALL ERECT ALL WARNING SIGNS, AND PROVIDE THE APPROPRIATE PERSONNEL, IF REQUIRED, AND ALL OTHER ITEMS REQUIRED TO SAFELY HANDLE VEHICULAR AND PEDESTRIAN TRAFFIC THROUGH WORK AREA. CONTRACTOR MUST COORDINATE THIS ACTIVITY WITH THE CITY OF MOBILE TRAFFIC CONTROL DEVICES SHALL BE PROVIDED BY THE CONTRACTOR. TRAFFIC CONTROL DEVICES PROVIDED MUST COMPLY WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, CURRENT EDITION. CONTRACTOR SHALL UNDERTAKE AND MAINTAIN ADEQUATE SAFETY MEASURES AS AND WHEN NECESSARY TO PROTECT EXISTING ROADS, STREETS, AND WALKWAYS FROM DAMAGE BY VEHICULAR TRAFFIC AND/OR HEAVY EQUIPMENT.

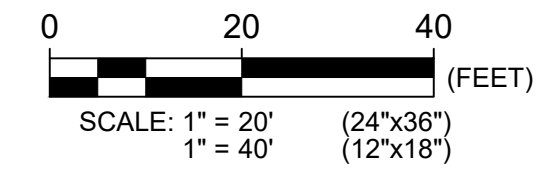
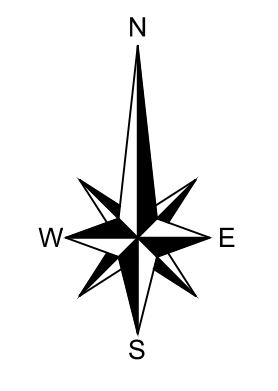
PROJECT CONSULTANTS:

CIVIL & STRUCTURAL ENGINEER: MOTT MACDONALD 200 W GARDEN ST #700 PENSACOLA, FL 32502 850.484.6011	ARCHITECT: MOTT MACDONALD 107 ST FRANCIS ST #2900 MOBILE, AL 36602 228.374.1409	MECHANICAL ENGINEER: SMITH MECHANICAL 7150 CHARLANDA CT. MOBILE, AL 36695 251.402.1364	ELECTRICAL CONSULTANT: DELL CONSULTING 813 DOWNTOWN BOULEVARD SUITE D MOBILE, AL 36609 251.316.0015
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NOTE:
 ALL PROPOSED CONCRETE SIDEWALKS SHALL BE ADA COMPLIANT. SIDEWALKS SHALL NOT EXCEED 5.0% GRADE IN THE DIRECTION OF TRAVEL AND SHALL NOT HAVE A CROSS-SLOPE GREATER THAN 2.0% MAX.



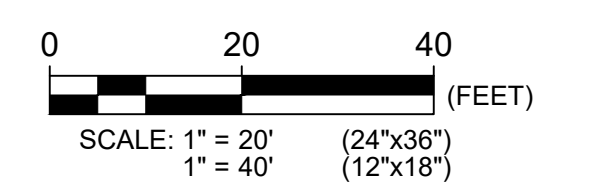
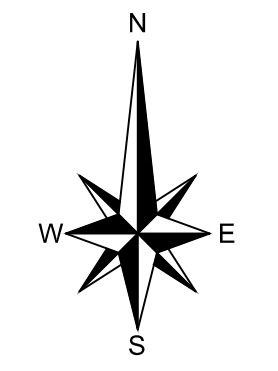
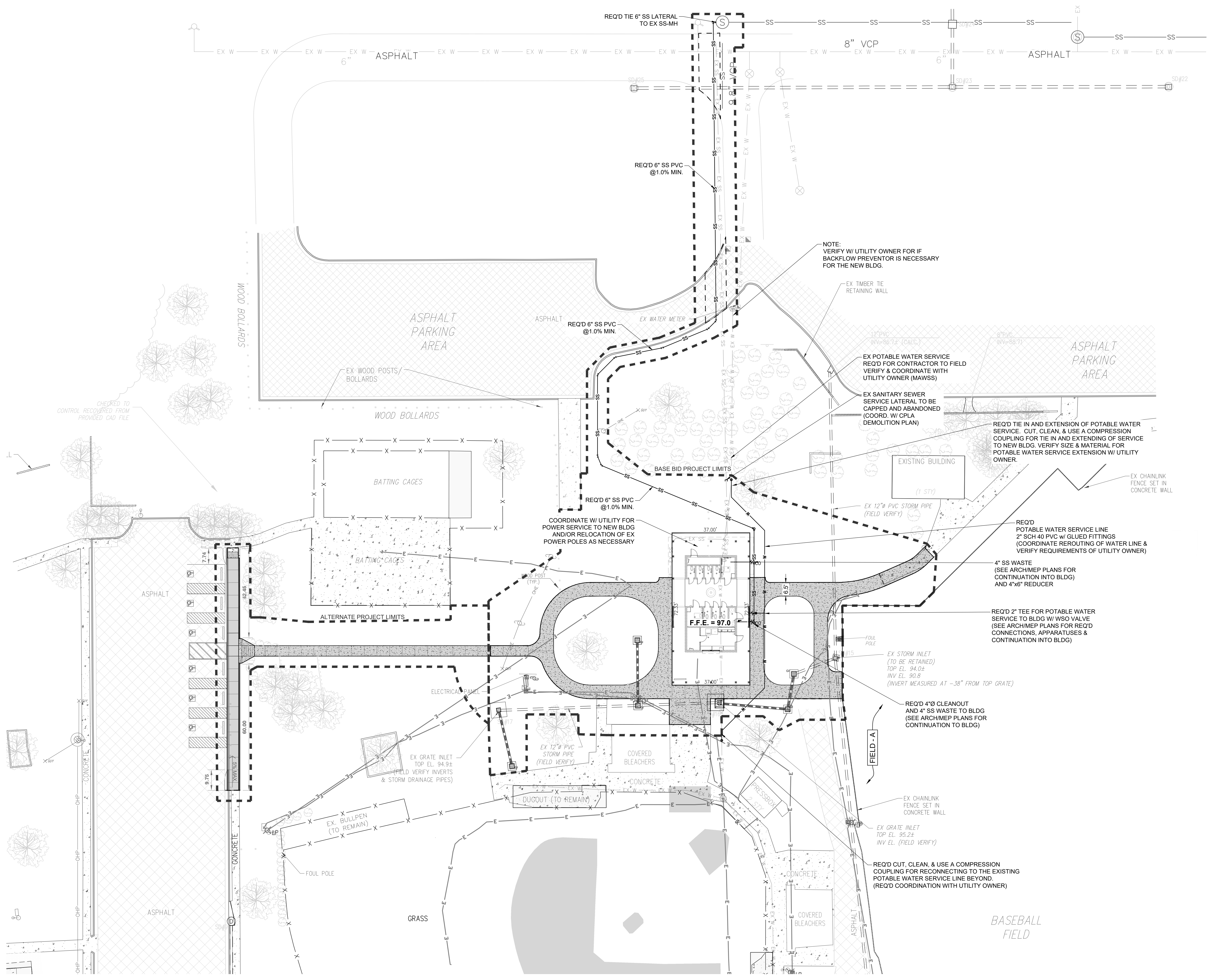
SYMBOLS LEGEND:

- EX W EX. WATER LINE
- EX SS EX. SAN. SEWER LINE
- OHE EX. OVHD ELEC. LINE
- X EX. FENCE
- EX. FIRE HYDRANT
- EX. STORM MANHOLE
- EX. LIGHTPOLE
- EX. SAN. SEWER MANHOLE
- EX. VALVE AND STUB OUT
- EX. CONCRETE
- EX. ASPHALT
- 109.75 EX. MINOR CONTOUR
- 110.00 EX. MAJOR CONTOUR
- EX. SPOT ELEVATION
- PROPOSED CONCRETE
- PROPOSED ASPHALT
- 109.75 PROP. MINOR CONTOUR
- 110.00 PROP. MAJOR CONTOUR
- 105.85 PROP. SPOT ELEVATION
- PROPOSED STORM PIPE & STRUCTURE

NOTES:

1. SURVEY PROVIDED BY CPLA
2. FIELD VERIFY ALL LAYOUT AND DIMENSIONS PRIOR TO CONSTRUCTION
3. FIELD VERIFY LOCATION OF ALL STRUCTURES, HARDSCAPES, UTILITIES, DRAINAGE, VEGETATION & CONDITIONS.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SITE LAYOUT USING A LICENSED SURVEYOR.
5. CONTRACTOR SHALL BE RESPONSIBLE TO PRESERVE AND PROTECT ALL EXISTING CONDITIONS TO REMAIN.
6. CONTRACTOR IS RESPONSIBLE FOR CALLING LINE LOCATE AND VERIFYING PRESENCE OF ANY AND ALL UTILITIES
7. CONTRACTOR IS RESPONSIBLE FOR ENSURING POSITIVE DRAINAGE.
8. CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS.
9. REPORT ANY DISCREPANCIES TO LANDSCAPE ARCHITECT IMMEDIATELY.
10. CONTRACTOR SHALL VERIFY POSITIVE DRAINAGE FLOW WITHIN THE EXISTING STORM DRAINAGE INFRASTRUCTURE. CONTRACTOR IS RESPONSIBLE FOR FLUSHING OF SEDIMENT AND DEBRIS DEPOSITS TO RESTORE THE INTEGRITY OF THE DRAINAGE SYSTEM. NOTIFY LANDSCAPE ARCHITECT WITH ANY DISCREPANCIES BETWEEN FIELD VERIFIED CONDITIONS AND THESE PLANS.
11. CONTRACTOR IS RESPONSIBLE FOR THE IMPLEMENTATION AND MAINTAINING CONSTRUCTION BEST MANAGEMENT PRACTICES THROUGHOUT THE DURATION OF THE PROJECT IN ACCORDANCE WITH ADEM PERMIT REQUIREMENTS.
12. ALL PROPOSED CONCRETE PEDESTRIAN PATHS ON THIS PLAN ARE DESIGNED TO BE ADA COMPLIANT. REFER TO THE LND ARCH DETAILS SHEETS.





SYMBOLS LEGEND:

	EX. WATER LINE
	EX. SAN. SEWER LINE
	EX. OVHD ELEC LINE
	EX. FENCE
	EX. FIRE HYDRANT
	EX. STORM MANHOLE
	EX. LIGHTPOLE
	EX. SAN. SEWER MANHOLE
	EX. VALVE AND STUB OUT
	EX. CONCRETE
	EX. ASPHALT
	EX. MINOR CONTOUR
	EX. MAJOR CONTOUR
	EX. SPOT ELEVATION
	PROPOSED CONCRETE
	PROPOSED ASPHALT

NOTES:

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6. CONTRACTOR IS RESPONSIBLE FOR ENSURING POSITIVE DRAINAGE.
7. CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS. REPORT ANY DISCREPANCIES TO LANDSCAPE ARCHITECT IMMEDIATELY.
8. CONTRACTOR SHALL COORDINATE DISCONNECTION, REMOVAL AND NEW BUILDING SERVICE REQUIREMENTS AND CONNECTIONS WITH UTILITY OWNER PRIOR TO COMMENCING WITH CONSTRUCTION ACTIVITIES.
9. ALL WATER & SEWER UTILITY WORK SHALL BE IN ACCORDANCE WITH MAWSS UTILITY SPECIFICATIONS, REQUIREMENTS.
10. REFER TO MECHANICAL AND PLUMBING BUILDING PLANS FOR COORDINATION OF WORK.
11. REFER TO THE SITE ELECTRICAL PLAN FOR REQUIRED PROJECT WORK AS RELATES TO ELECTRICAL AND/OR COMMUNICATIONS UTILITIES.



PROJECT NOTES

- ALL REQUIRED IMPROVEMENTS, EQUIPMENT, AND WORKMANSHIP SHALL BE COMPLETED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
- ALL MATERIALS, EQUIPMENT AND WORKMANSHIP SHALL COMPLY WITH REFERENCED SECTIONS OF ALABAMA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION 2022 EDITION, AND THESE PLANS AND SPECIFICATIONS. CONSTRUCTION SHALL COMPLY WITH THE APPLICABLE DETAILS CONTAINED IN ALDOT'S SPECIAL AND STANDARD HIGHWAY DRAWINGS, AND THE PROJECT CONSTRUCTION PLANS AND SPECIFICATIONS.
- THE EXACT LOCATION OF EXISTING STRUCTURES, UTILITIES AND PIPING SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE CONSTRUCTION BEGINS. THESE DRAWINGS DO NOT PURPORT TO SHOW IN COMPLETE DETAIL ALL EXISTING STRUCTURES, UTILITIES OR PIPING. THE CONTRACTOR SHALL EXAMINE ALL AVAILABLE RECORDS AND MAKE ALL EXPLORATIONS AND EXCAVATIONS AS REQUIRED TO DETERMINE THE LOCATION OF EXISTING STRUCTURES, UTILITIES AND PIPES. THE OWNER RESERVES THE RIGHT TO CHANGE LOCATIONS OF PROPOSED UNDERGROUND UTILITIES TO AVOID CONFLICT WITH EXISTING STRUCTURES, UTILITIES OR PIPING. ANY SIGNIFICANT CHANGES SHALL BE APPROVED BY THE OWNER OR HIS REPRESENTATIVES PRIOR TO PLACEMENT.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE DONE BY HIS EQUIPMENT TO EXISTING UTILITIES, STORM DRAIN, DRAINAGE STRUCTURES PIPES AND HEADWALLS OR OTHER EXISTING SITE FEATURES TO REMAIN, INCLUDING OWNER MATERIAL STORED ON-SITE. ALL DAMAGED ITEMS SHALL BE REPLACED IN LIKE KIND AT NO ADDITIONAL COST TO THE OWNER.
- ALL PROPERTY LINE MARKERS (IRON PINS, CONCRETE MONUMENTS, ETC.) DESTROYED DURING CONSTRUCTION SHALL BE REPLACED IN KIND BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL EMPLOY A LAND SURVEYOR REGISTERED IN THE STATE OF ALABAMA TO RESET PROPERTY MARKERS.
- ALL EXCAVATION, SHORING AND BRACING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING FLOWS THROUGH EXISTING PIPING AND STRUCTURES AND DIVERSION OF FLOWS AS NECESSARY DURING CONSTRUCTION UNDER THIS CONTRACT.
- TRAFFIC REGULATIONS AND CONTROL ON AND ADJACENT TO THE PROJECT AREA SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL TAKE MEASURES TO PREVENT SOIL, SEDIMENT, AND TURBIDITY FROM WASHING INTO ALL CREEKS, BRANCHES, STREAMS, RIVERS, PRIVATE OR PUBLIC PROPERTY.
- CONTRACTOR SHALL ADHERE TO MIN. COVER AND CONSTRUCTION LOADING REQUIREMENTS / RESTRICTIONS DURING CONSTRUCTION.
- STORM SEWER PIPE SHALL BE CLASS III R.C.P., UNLESS OTHERWISE NOTED ON PIPE DESCRIPTION.
- ALL STORM PIPE SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS.
- REMOVE EXISTING PIPING AND INLETS AS NECESSARY FOR INSTALLATION OF NEW PIPING AND STRUCTURES.
- PIPE LENGTHS ARE MEASURED HORIZONTALLY FROM CENTERLINE OF STRUCTURES AND ROUNDED TO THE NEAREST 1/10TH FOOT.
- ALL STORM SEWER MANHOLES, JUNCTION BOXES, INLETS IN PAVED AREAS SHALL BE FLUSH WITH HARDSCAPE, AND SHALL HAVE TRAFFIC BEARING LIDS.
- CONSTRUCTION SHALL COMPLY WITH ALL GOVERNING CODES AND BE CONSTRUCTED TO SAME. THE CONTRACTOR SHALL ADHERE TO ALL TERMS & CONDITIONS AS OUTLINED IN THE GENERAL N.P.D.E.S PERMIT AND THE CITY OF MOBILE STORM WATER MANAGEMENT AND FLOOD CONTROL ORDINANCE FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY. CONTRACTOR TO ABIDE BY CITY OF MOBILE LITTER ORDINANCE.
- PRE-CAST STRUCTURES MAY BE USED AS APPROVED BY ENGINEER.
- AN NPDES PERMIT HAS BEEN OBTAINED FOR THIS SITE. THE CONTRACTOR SHALL DESIGNATE THEMSELVES AS OPERATOR/QC/QI AND ABIDE BY ALL PERMIT REQUIREMENTS.
- ALL DISTURBED AREAS OF THIS CONSTRUCTION SITE SHALL BE SEEDED IN ACCORDANCE WITH ALDOT STANDARD SPECIFICATIONS FOR AREAS SUBJECT TO FREQUENT MOWING.
- INSTALL AND MAINTAIN SEDIMENT BARRIERS (ALDOT TYPE "A" SILT FENCE, OR EQUIVALENT) AT ALL LOCATIONS REQUIRED TO ENSURE FULL COMPLIANCE WITH ADEM NPDES REGULATIONS.
- EXCAVATION SIDE SLOPES SHALL COMPLY WITH THE MINIMUM STANDARDS OUTLINED IN THE OSHA MANUALS.
- IF CONTRACTOR DOES NOT ACCEPT EXISTING TOPOGRAPHY AS SHOWN ON THE PLANS, WITHOUT EXCEPTION, HE SHALL HAVE MADE AT HIS EXPENSE, A TOPOGRAPHY SURVEY BY AN ALABAMA REGISTERED LAND SURVEYOR AND SUBMIT IT TO THE OWNER FOR REVIEW PRIOR TO BID.
- PRIOR TO CONTRACT START, CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES (DEPTH AND HORIZONTAL LOCATION) AND SUBMIT A SHOP DRAWING SHOWING CONFLICT RESOLUTION TO THE OWNER FOR REVIEW.
- THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY TRAFFIC CONTROL ON THE SITE AND FOR ADJACENT ROADWAYS. CONTRACTOR SHALL COORDINATE WITH ALDOT AND CITY OF MOBILE AS NEEDED FOR TEMPORARY LANE CLOSURES IN THEIR RESPECTIVE RIGHTS OF WAY.
- THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING EROSION CONTROL BMPs FOR THE DURATION OF THE PROJECT. THE EROSION CONTROL PLAN IS NOT ALL-INCLUSIVE AND SHALL BE ADJUSTED AS NEEDED BASED ON FIELD CONDITIONS.

CITY OF MOBILE STANDARD NOTES

- CONTRACTOR SHALL CONTACT THE CITY ENGINEERING DEPARTMENT VIA EMAIL AT LAND.DISTURBANCE@CITYOFMOBILE.ORG AT LEAST 24 HOURS PRIOR TO BEGINNING ANY WORK ON THIS SITE TO SCHEDULE AN INITIAL ON-SITE BMP INSPECTION WITH THE APPROPRIATE CITY ENGINEER INSPECTOR. FAILURE TO CONTACT THE CITY ENGINEERING DEPARTMENT PRIOR TO BEGINNING WORK IS A VIOLATION OF THE STORM WATER MANAGEMENT AND FLOOD CONTROL ORDINANCE AND MAY INVOKE ENFORCEMENT ACTION IN THE FORM OF A MUNICIPAL OFFENSE TICKET.
- THE LAND DISTURBANCE PERMIT (LDP) EXPIRES UPON THE COMPLETION OF THE WORK OR NOT LATER THAN ONE (1) YEAR FROM THE DATE OF ISSUANCE (17-61a).
- A VIDEO SHALL BE SUBMITTED TO THE CITY SHOWING THE PIPE FROM THE OUTLET STRUCTURES TO THE CITY DRAINAGE SYSTEM, AND THE PIPE CARRYING PUBLIC WATER (THE PIPES BETWEEN CL 2, GL 7, GL 9, AND MH 2 AND THE NEXT DOWNSTREAM EXISTING STRUCTURE). THE PIPE MUST BE VIDEOED AFTER THE PROJECT'S COMPLETION, BUT PRIOR TO THE REQUEST OF A CERTIFICATE OF OCCUPANCY. SUBMIT THE VIDEO TO THE CITY OF MOBILE CENTRAL PERMITTING ALONG WITH ENGINEER'S AS-BUILT CERTIFICATION PACKAGE. THE VIDEO NEEDS TO BE REVIEWED BY THE PROJECT ENGINEER BEFORE BEING SUBMITTED TO THE CITY. EACH JOINT NEEDS TO BE PANNED LEFT AND RIGHT AS WELL AS ANY DEFICIENCIES BEING WELL DOCUMENTED VIA VIDEOGRAPHY, INCLUDING A WRITTEN REPORT.
- THE CONTRACTOR SHALL SIZE, INSTALL, AND MAINTAIN ADEQUATE CONTROLS FOR THE SITE. REFER TO THE ALABAMA HANDBOOK FOR EROSION CONTROL SEDIMENT CONTROL AND STORMWATER MANAGEMENT ON CONSTRUCTION SITES AND URBAN AREAS, LATEST EDITION.
- THE CONTRACTOR IS RESPONSIBLE FOR DAILY INSPECTION AND CONTINUED MAINTENANCE OF EROSION CONTROL ELEMENTS.
- DISTURBED AREA(S) MAY NOT REMAIN DENUDE LONGER THAN 10 DAYS PER ADEM MS-4 PERMIT CONDITIONS.

SITE GRADING AND STAKING NOTES

- THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
- TOPSOIL SHALL BE PLACED WHERE INDICATED ON THE CONSTRUCTION PLANS AND ALL DISTURBED AREAS SHALL BE SEEDDED, SOILED, SODDED OR LANDSCAPED ONCE FINAL GRADING OPERATIONS HAVE BEEN COMPLETED WITHIN THE SPECIFIC AREA.
- ALL EMBANKMENT FILL AND BORROW EXCAVATION MATERIALS BENEATH REQUIRED PAVEMENT SHALL BE COMPACTED IN LOOSE 6" LIFTS TO 95% (+/- 2%) STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D698), WITHIN +/- 5% OF OPTIMUM MOISTURE CONTENT.
- THE CONTRACTOR SHALL CLEAR AND GRUB ONLY WHERE GRADING OPERATIONS ARE TO BE PERFORMED AS SHOWN ON THE GRADING PLANS.
- CONTRACTOR SHALL DEFER TO THE GEOTECHNICAL ENGINEERING-TESTING, INC. REPORT FOR REMOVING AND REPLACEMENT OF EXISTING SOIL MATERIALS. CONTRACTOR SHALL FOLLOW DIRECTION OF GEOTECHNICAL ENGINEERING-TESTING, INC. AT SITE DURING EARTHWORK OPERATIONS.
- ALL UNCLASSIFIED QUANTITIES SHALL BE PAID AS PLAN QUANTITIES (NOT TRUCK TICKETS, ETC.)

UTILITY NOTES

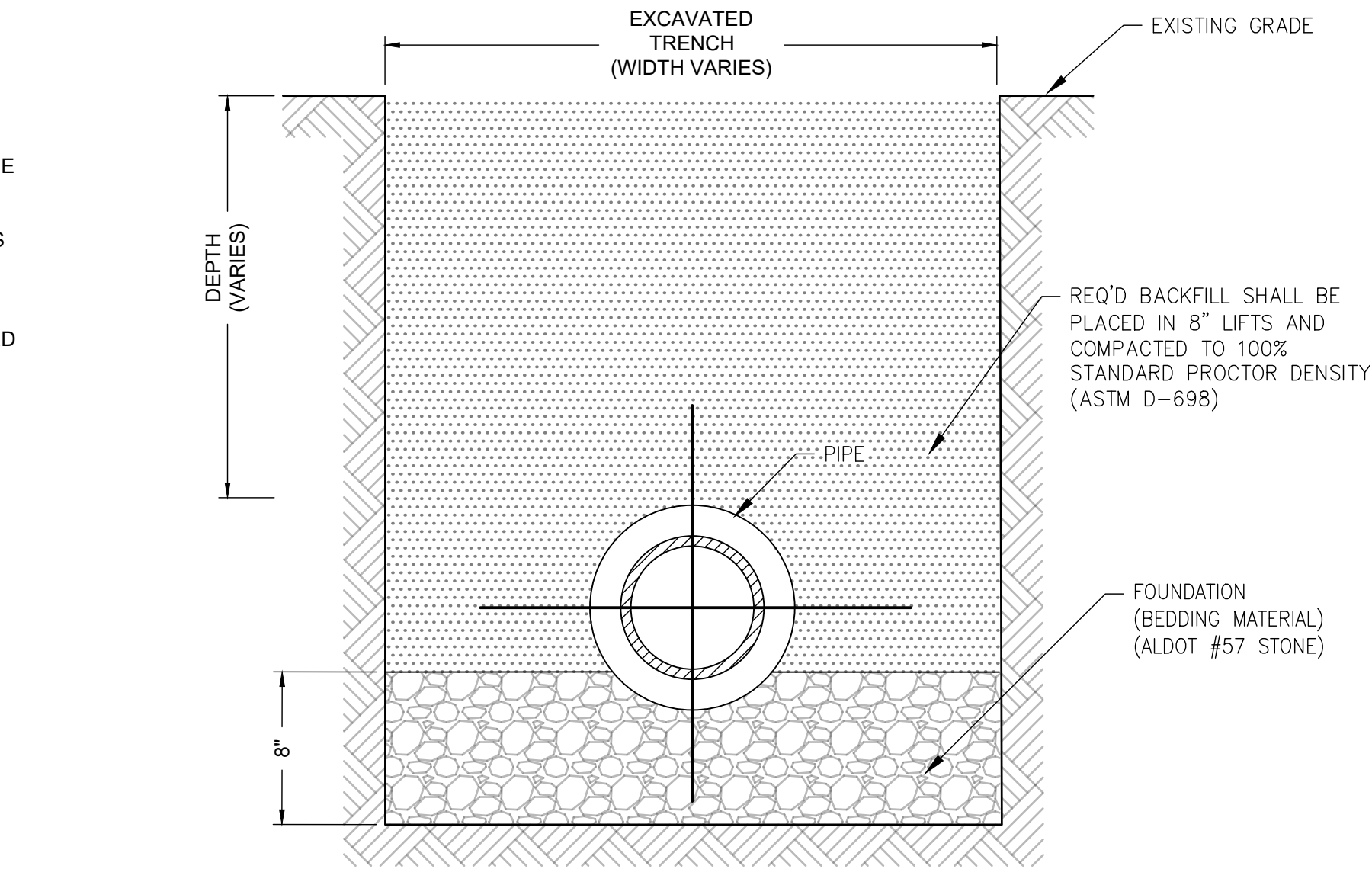
- WHEN INSTALLING UTILITIES, THE CONTRACTOR SHALL REFERENCE THE STORM DRAIN, SANITARY SEWER, WATER DISTRIBUTION/FIRE PROTECTION, ETC. CONSTRUCTION PLANS TO MAKE SURE INDIVIDUAL UTILITIES AND POLES ARE PLACED IN THE CORRECT HORIZONTAL AND VERTICAL LOCATIONS TO MAINTAIN SPACING AND MINIMUM COVER. THE CONTRACTOR SHALL NOTE THAT IF UTILITIES ARE INSTALLED WITH MINIMUM COVER OR NOT IN THE DESIGNATED LOCATIONS, THE CONDUITS, DUCT BANKS, PIPINGS, MANHOLES, ETC. SHALL BE REMOVED/REPLACED AT THE CONTRACTOR'S EXPENSE.
- CURRENT MOBILE AREA WATER AND SEWER SYSTEM (MAWSS) STANDARDS AND SPECIFICATIONS SHALL APPLY TO ALL WATER AND SANITARY SEWER INSTALLED ON THIS PROJECT.

WATER DISTRIBUTION NOTES

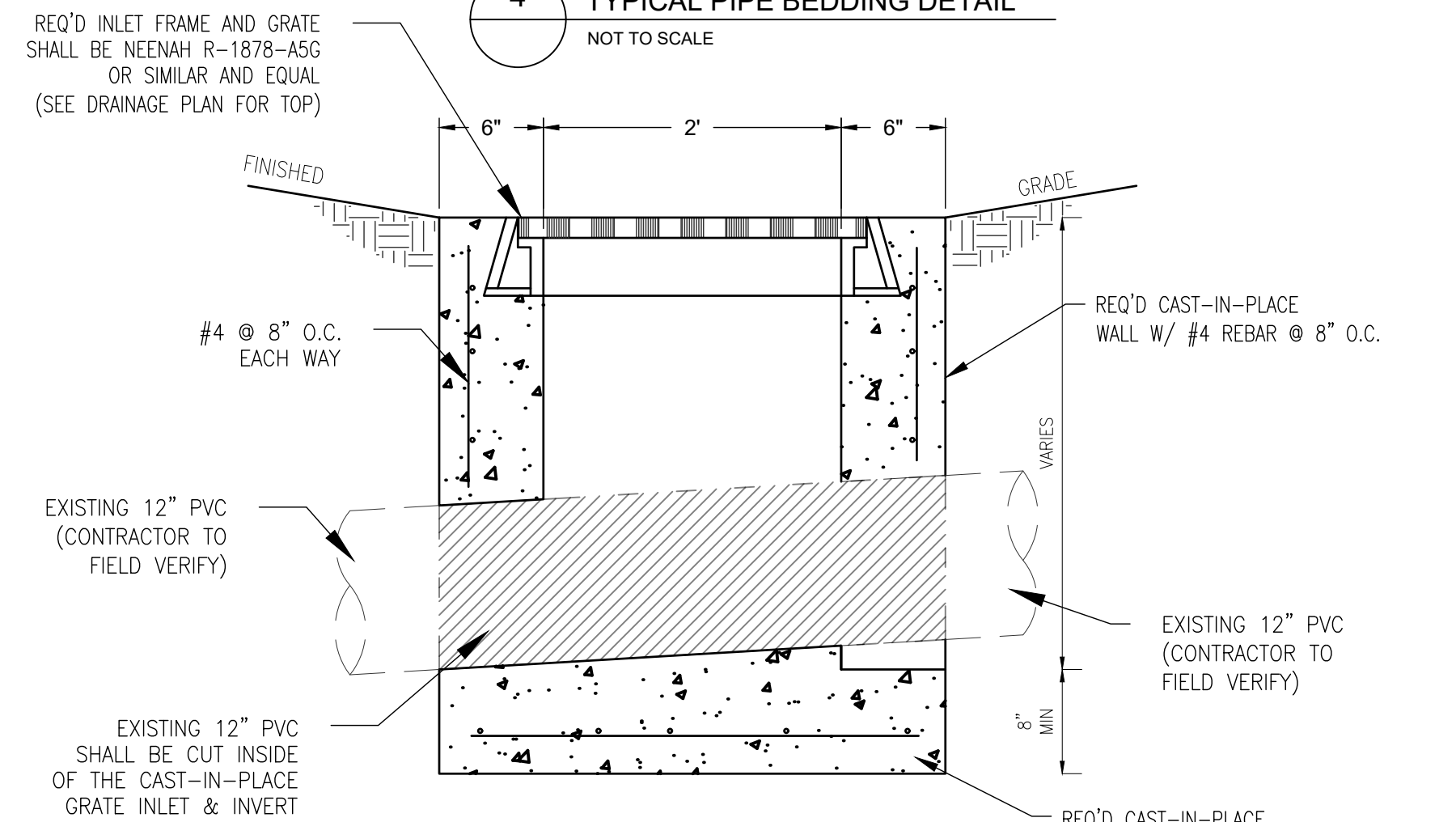
- THE WATER DISTRIBUTION SYSTEM THAT WILL BE TAPPED FOR THIS DEVELOPMENT IS OWNED AND OPERATED BY MOBILE AREA WATER AND SEWER SYSTEM (MAWSS). THE CONTRACTOR SHALL NOT AT ANY TIME TURN ON/OFF EXISTING WATER VALVES AND FIRE HYDRANTS, TAPS AND CONNECTIONS TO EXISTING MAINS SHALL BE APPROVED AND COORDINATED WITH MAWSS. ANY FINES AND/OR PENALTIES INCURRED BY THE CONTRACTOR FOR IMPROPER OPERATION OF THE WATER DISTRIBUTION AND FIRE PROTECTION SYSTEM SHALL BE THE EXCLUSIVE RESPONSIBILITY OF THE CONTRACTOR (APPLIES TO CONTRACTOR AND ALL SUBCONTRACTORS).
- MAWSS, OWNER'S REPRESENTATIVE, AND LOCAL WATER CUSTOMERS SHALL BE NOTIFIED A MINIMUM OF 48 HOURS IN ADVANCE BEFORE ANY WATER DISTRIBUTION IMPROVEMENTS BEGIN.
- ALL MAINS AND SERVICE LINES SHALL HAVE 36" MINIMUM COVER.
- BACKFLOW PREVENTERS, WATER LATERALS, WATER MAINS ETC. SHALL BE INSTALLED ACCORDING TO MAWSS STANDARDS AND THE STANDARD DETAILS INCLUDED IN THIS PLAN SET.
- ALL WATER DISTRIBUTION MAINS SHALL HAVE DUCTILE IRON FITTINGS ONLY. ALL GATE VALVES INSTALLED ON THE WATER DISTRIBUTION SYSTEM SHALL BE RESILIENT WEDGE VALVES TO ENSURE EASE OF OPERATION AND RELIABILITY.
- THE CONTRACTOR SHALL VERIFY THE EXISTING WATER MAIN LOCATIONS PRIOR TO INSTALLING THE REQUIRED WATER MAINS. THESE LOCATIONS SHALL BE PROVIDED TO THE OWNER'S REPRESENTATIVE FOR VERIFICATION.

SANITARY SEWER NOTES

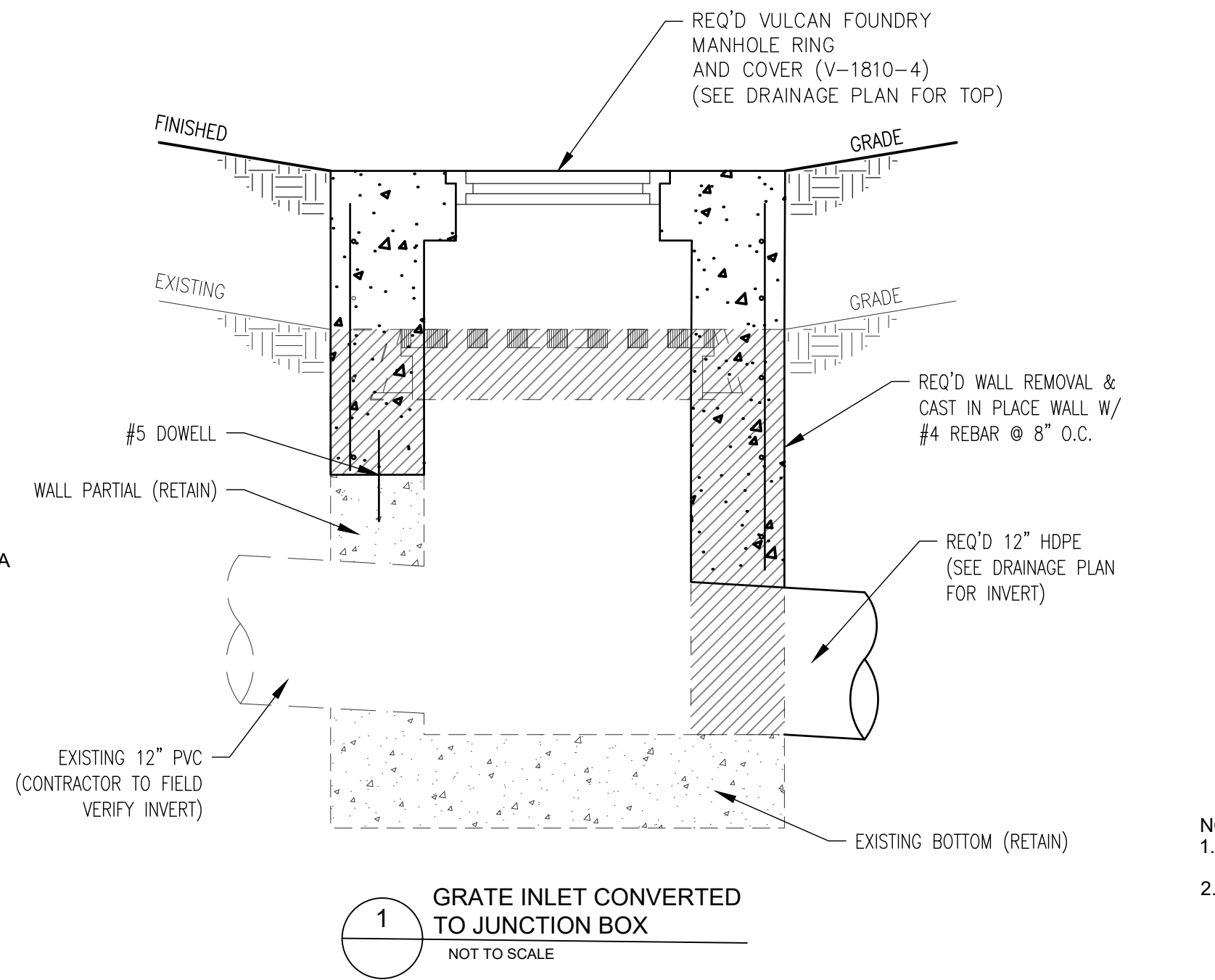
- MOBILE AREA WATER AND SEWER SYSTEM (MAWSS), OWNER'S REPRESENTATIVE, AND LOCAL BUSINESSES/RESIDENTS SHALL BE NOTIFIED A MINIMUM OF 48 HOURS IN ADVANCE BEFORE ANY SANITARY SEWER IMPROVEMENTS BEGIN.
- THE CONTRACTOR SHALL VERIFY CONNECTIONS FOR FLOW LINE ELEVATIONS OF EXISTING SANITARY SEWER PIPING AND MANHOLE INVERTS BEFORE INSTALLING ANY REQUIRED SANITARY SEWER STRUCTURES AND PIPING. THE OWNER'S REPRESENTATIVE SHALL VERIFY THE PROPOSED DESIGN AS SOME INFORMATION WAS NOT VERIFIABLE DURING THE DESIGN. IF THE CONTRACTOR IGNORES THIS REQUEST AND HIS INSTALLATION IS INCORRECT, THEN IT SHALL BE HIS RESPONSIBILITY TO RELAY OR RESET ALL PIPING OR STRUCTURES AT HIS COST AFTER THE OWNER'S REPRESENTATIVE FIELD VERIFIES THE INVERTS AND/OR GRADES.
- ALL REQUIRED SANITARY STRUCTURE TOPS WITHIN A PAVED AREA SHALL MATCH FINISHED PAVEMENT GRADE.
- ALL SANITARY SEWER MAINS AND SERVICE CONNECTIONS SHALL HAVE DUCTILE IRON FITTINGS ONLY AS PER THE DETAILS REGARDLESS OF THE MAIN OR LATERAL TYPE (PVC OR D.I.).
- ANY EXISTING SANITARY STRUCTURES RETAINED AS PART OF THIS PROJECT SHALL BE THOROUGHLY CLEANED, WALLS PIPED WITH GROUT TO MAKE WATER TIGHT, INVERTS FORMED IF NECESSARY, EXISTING PIPING/DRAINS REGROUTED, ETC.



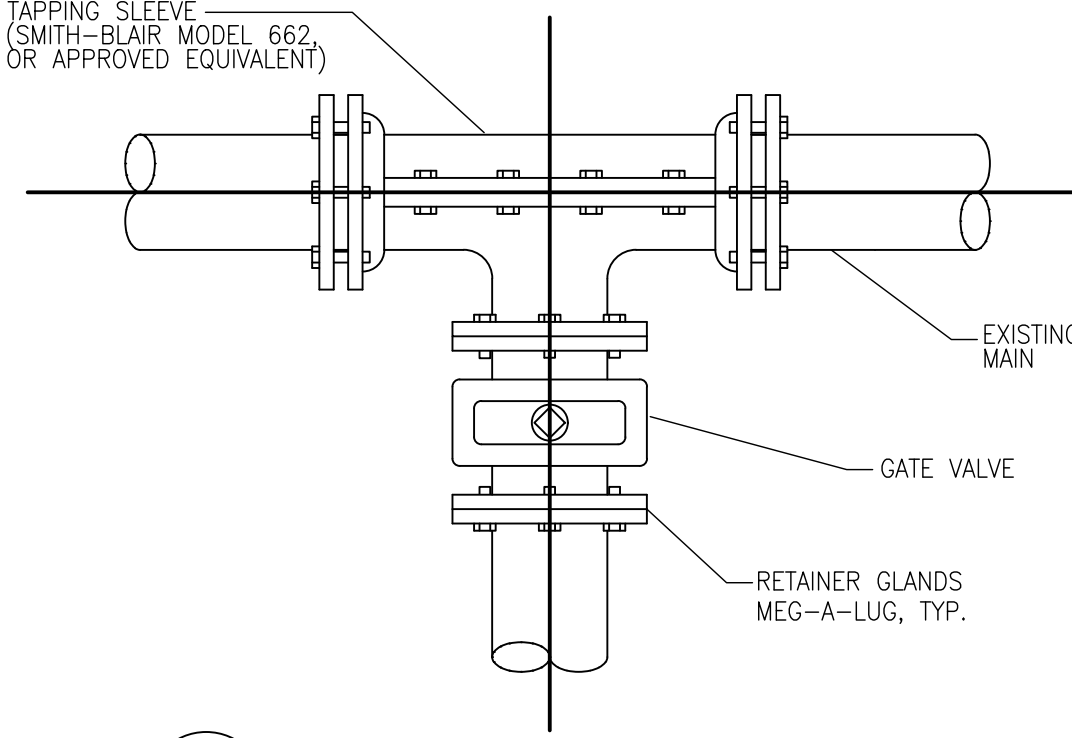
4 TYPICAL PIPE BEDDING DETAIL
NOT TO SCALE



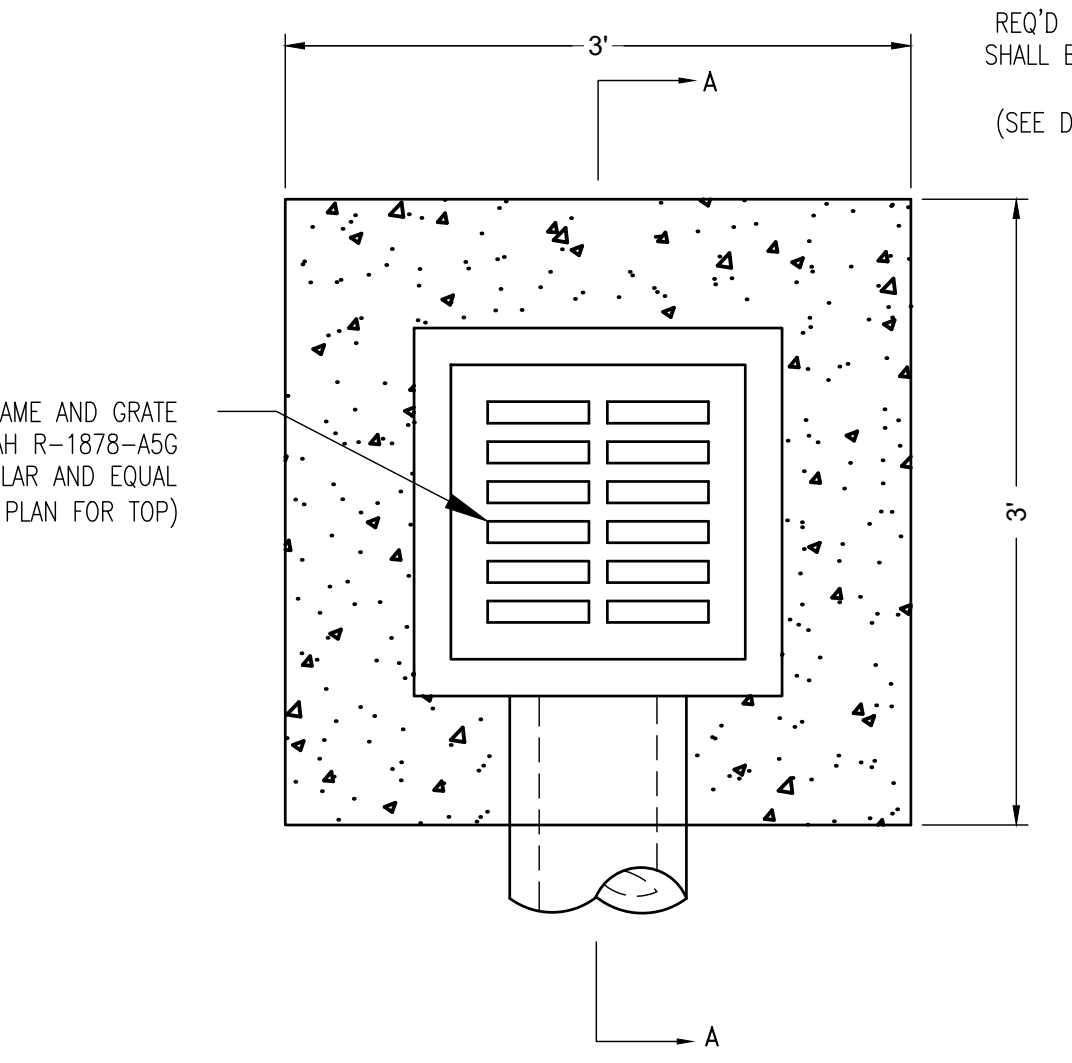
7 TYPICAL DOGHOUSE GRATE INLET
NOT TO SCALE



1 GRATE INLET CONVERTED TO JUNCTION BOX
NOT TO SCALE

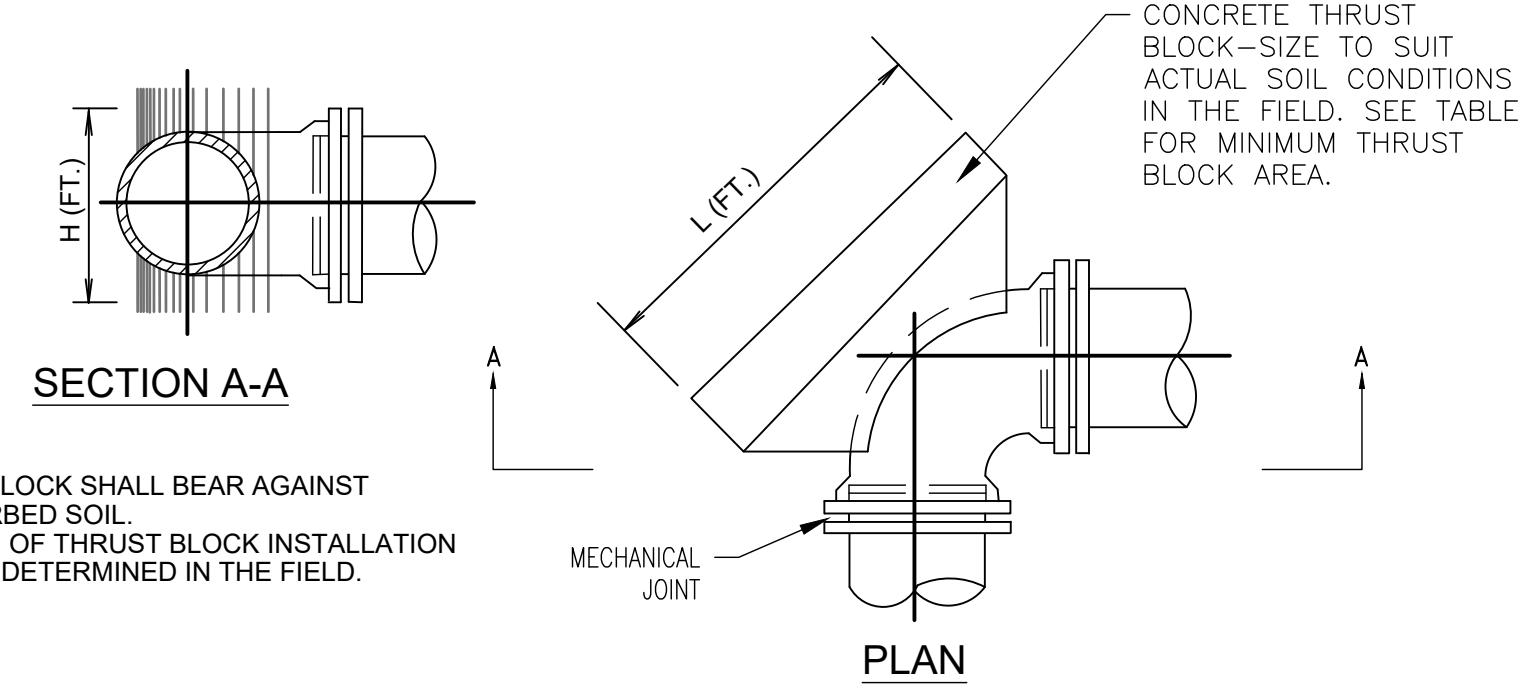


5 TYPICAL TAPPING SLEEVE & VALVE DETAIL
NOT TO SCALE

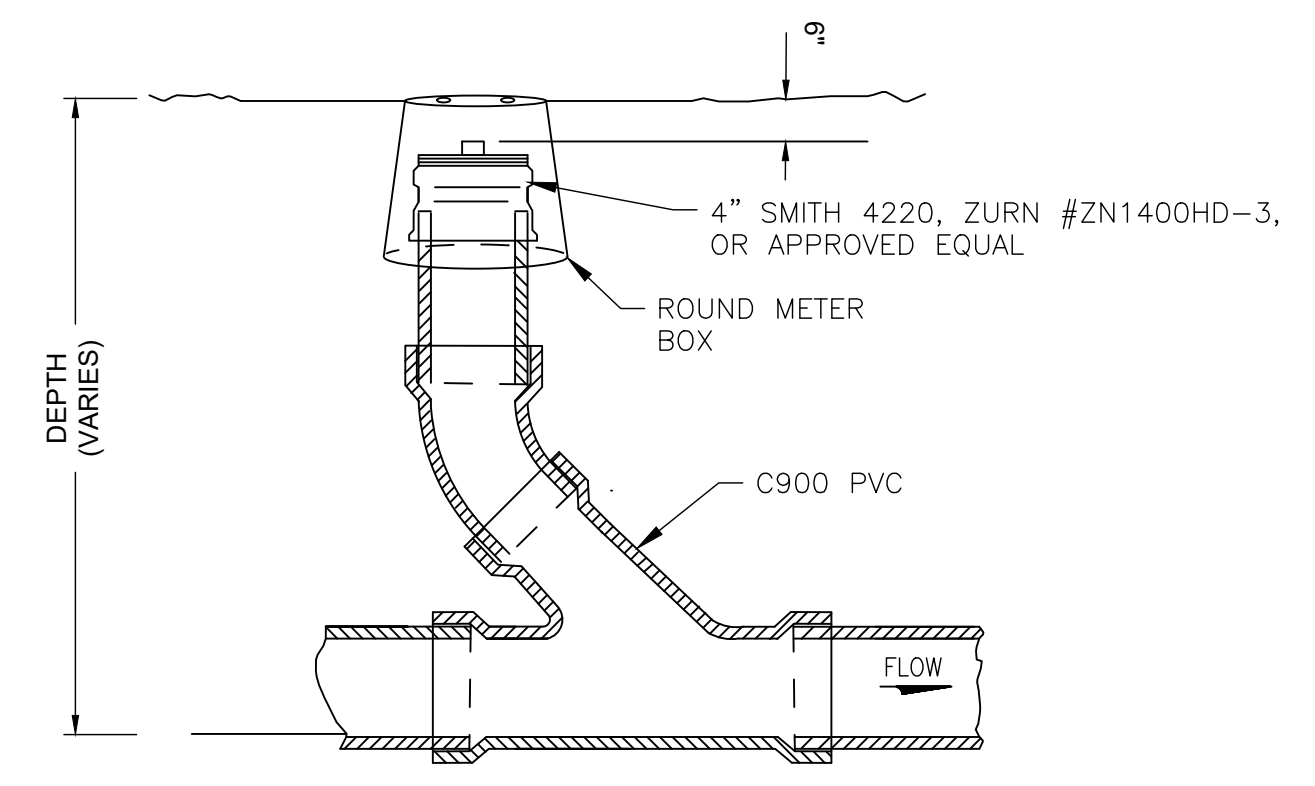


8 TYPICAL GRATE INLET
NOT TO SCALE

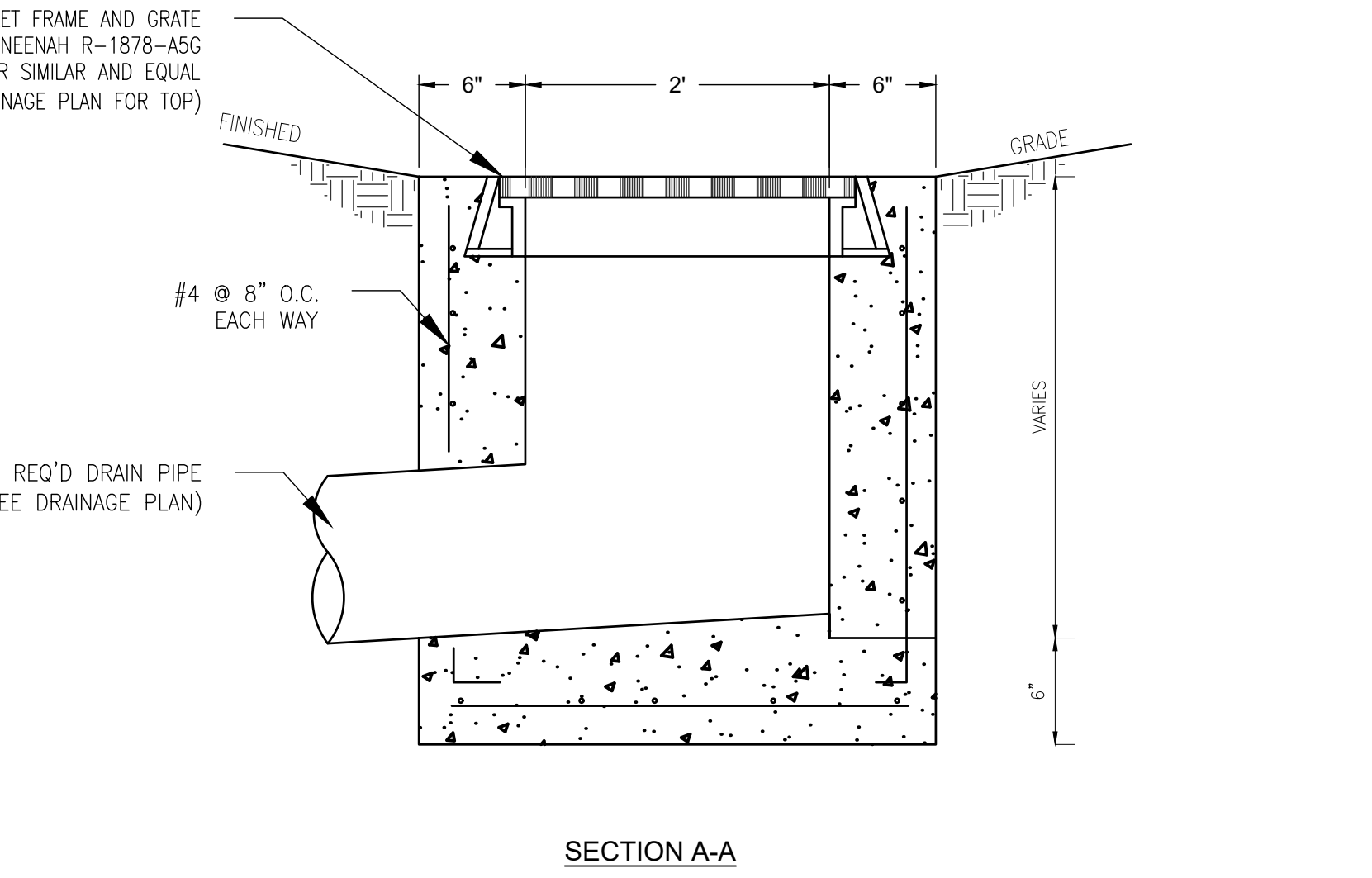
TYPICAL THRUST BLOCKS			
MINIMUM THRUST BLOCK AREA SQ. FT. L (FT.) X H (FT.)			
INSIDE DIA. PIPE LINE IN INCHES	90° BENDS	TEES, DEAD ENDS, OR 45° BENDS	22.5° BENDS
6"	3.0	2.2	1.0
8"	5.5	4.0	1.5
10"	8.5	6.0	2.5
12"	12.0	9.0	3.5
16"	22.0	16.0	6.0
18"	27.0	20.0	8.0
20"	34.0	24.0	10.0
24"	48.0	34.0	14.0
30"	75.0	53.0	21.0



2 TYPICAL THRUST BLOCK DETAIL FOR BENDS
NOT TO SCALE



6 TYPICAL CLEANOUT
NOT TO SCALE



SECTION A-A

ELECTRICAL SPECIFICATIONS

1. GENERAL ELECTRICAL:
 - 1.1. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY FOR THE INSTALLATION OF A COMPLETE ELECTRICAL SYSTEM AS INDICATED WITHIN THESE DRAWINGS. ALL WORK SHALL BE INSTALLED IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES AND ORDINANCES AND WITH MANUFACTURER'S RECOMMENDATIONS.
 - 1.2. THE CONTRACTOR SHALL CAREFULLY EXAMINE THE ARCHITECTURAL, STRUCTURAL, ELECTRICAL AND MECHANICAL DRAWINGS PRIOR TO SUBMITTING HIS BID. THE CONTRACTOR WILL BE REQUIRED TO FURNISH, INSTALL AND CONNECT ALL ITEMS AS INDICATED ON THE DRAWINGS.
 - 1.3. THE ARCHITECT SHALL BE NOTIFIED OF ANY CONFLICTS, OR INTERFERENCES THAT OCCUR BETWEEN INDIVIDUAL DRAWINGS.
 - 1.4. ALL MATERIALS AND EQUIPMENT SHALL BE INSTALLED IN A NEAT, FIRST CLASS, WORKMANLIKE MANNER, TO THE APPROVAL OF THE ARCHITECT/ENGINEER AND GOVERNING AUTHORITIES.
 - 1.5. IN ADDITION TO THE MANUFACTURERS STANDARD GUARANTEES, THE CONTRACTOR SHALL GUARANTEE ALL MATERIALS, EQUIPMENT AND WORKMANSHIP AGAINST DEFECTS FOR ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE, AND SHALL CORRECT ANY DEFECTS AT NO ADDITIONAL COST TO THE OWNER. ALL LAMPS SHALL BE GUARANTEED FOR 30 DAYS AFTER ACCEPTANCE.
 - 1.6. THE LOADS SHOWN FOR APPLIANCES AND EQUIPMENT ARE BASED ON DESIGN INFORMATION. THE CONTRACTOR SHALL VERIFY ALL APPLIANCE LOADS PRIOR TO RUNNING THE CIRCUIT. THE MINIMUM CIRCUIT REQUIREMENTS SHALL BE BASED ON THE APPLIANCE NAMEPLATE VALUE OR CODE REQUIREMENTS, WHICHEVER IS MORE STRINGENT. ADDITIONAL COMPENSATION SHALL NOT BE ALLOWED FOR APPLIANCE MODIFICATIONS BY THE CONTRACTOR.
 - 1.7. PRIOR APPROVAL: PRIOR APPROVAL SHALL BE REQUIRED FOR ANY MANUFACTURER OTHER THAN THOSE LISTED FOR ALL SPECIFIED ITEMS IN THESE DRAWINGS. SUBMIT ALL REQUESTS FOR PRIOR APPROVAL 2 WEEKS PRIOR TO BID OPENING. ENGINEER'S APPROVAL WILL BE IN THE FORM OF AN ADDENDUM.

2. CODES & STANDARDS:
 - 2.1. INSTALLATION AND MATERIALS SHALL COMPLY WITH THE LATEST ADOPTED EDITION OF THE FOLLOWING CODES & STANDARDS:
 - 2.1.1. NATIONAL ELECTRICAL CODE.
 - 2.1.2. NFPA 72. NATIONAL FIRE PROTECTION CODE.
 - 2.1.3. INTERNATIONAL BUILDING CODE.
 - 2.1.4. INTERNATIONAL ENERGY CONSERVATION CODE.
 - 2.1.5. NFPA 101.
 - 2.1.6. ADA .
 - 2.1.7. ANSI.
 - 2.1.8. NEMA.
 - 2.1.9. OSHA.
 - 2.1.10. UL.

3. ALTERATIONS & ADDITIONS TO EXISTING WORK:
 - 3.1. PROVIDE ALL NECESSARY ADDITIONS AND ALTERATIONS TO EXISTING WORK AS REQUIRED TO PROVIDE AND MAINTAIN A COMPLETE AND PROPER ELECTRICAL INSTALLATION.
 - 3.2. AS NECESSARY, RELOCATE EXISTING ELECTRICAL WORK SO OTHER TRADES CAN PURSUE THEIR WORK.
 - 3.3. MAINTAIN POWER TO EXISTING PORTIONS OF BUILDINGS FED FROM OR THROUGH AREA IN SCOPE OF THIS CONTRACT.
 - 3.4. COORDINATE ALL REQUIRED OUTAGES WITH OWNER.

4. BASIC MATERIALS & METHODS:
 - 4.1. ALL POWER AND DISTRIBUTION CABLING SHALL BE COPPER TYPE THWN/THHN.
 - 4.2. ALL ELECTRICAL EQUIPMENT, DEVICES, ETC. LOCATED OUTDOORS SHALL BE WEATHERPROOF.
 - 4.3. ELECTRICAL CONTRACTOR SHALL PROVIDE ADEQUATE AND PROPER SUPPORT FOR ALL ELECTRICAL OUTLETS, DEVICES, LIGHT FIXTURES, ETC. BUILT IN OR MOUNTED ON CEILINGS. NO OUTLET BOX, DEVICE, LIGHT FIXTURE, ETC. SHALL BE SUPPORTED FROM ANY ACOUSTICAL CEILING TILE OR DRYWALL CEILINGS. PROVIDE METAL SUPPORTS THAT ARE MADE FOR USE WITH CEILING GRID SYSTEMS OR PROVIDE HANGERS FROM STRUCTURE ABOVE.
 - 4.4. CONDUIT ROUTINGS AND DEVICE/EQUIPMENT LOCATIONS SHOWN ARE DIAGRAMMATIC ONLY. CONTRACTOR SHALL FIELD ROUTE AND LOCATE AS REQUIRED. CONDUIT ROUTINGS SHALL BE PARALLEL OR PERPENDICULAR TO BUILDING LINES.
 - 4.5. JUNCTION BOXES LOCATED ABOVE CEILING SHALL BE INSTALLED FACING DOWN AND SHALL BE ACCESSIBLE AFTER INSTALLATION.
 - 4.6. COORDINATE ALL ELECTRICAL WORK WITH OTHER TRADES AND STRUCTURAL COMPONENTS.
 - 4.7. THE CONDUIT MATERIAL SHALL BE AS FOLLOWS:
 - 4.7.1. BELOW GRADE - RNC (POWER & SITE LIGHTING ONLY). ELBOWS >1-1/2" SHALL BE RGS.
 - 4.7.2. RISER FROM 36" BELOW GRADE - RGS.
 - 4.7.3. CONCEALED RISER FROM 36" BELOW GRADE - RNC (POWER ONLY).
 - 4.7.4. ABOVE GRADE SUBJECT TO PHYSICAL ABUSE - RGS.
 - 4.7.5. ABOVE GRADE NOT SUBJECT TO PHYSICAL ABUSE OR WEATHER - EMT.
 - 4.7.6. INDOORS NOT SUBJECT TO PHYSICAL ABUSE - EMT. OR METAL CLAD CABLE(AS ALLOWED BY LOCAL AUTHORITY HAVING JURISDICTION).
 - 4.7.7. FINAL CONDUIT CONNECTIONS TO HEAT PUMPS, AIR HANDLERS, EXHAUST FANS, AND WATER HEATERS SHALL BE LFMC WHETHER INTERIOR OR EXTERIOR.
 - 4.8. CONDUIT FITTINGS SHALL BE AS FOLLOWS:
 - 4.8.1. EMT - <=2" USE STEEL SET SCREW WITH INSULATED THROATS FOR INTERIOR/ USE COMPRESSION FITTINGS WITH INSULATED THROATS FOR EXTERIOR. >2" USE SET-SCREW STEEL WITH INSULATED THROATS.
 - 4.8.2. RGS - THREADED GALVANIZED STEEL.
 - 4.8.3. PVC - PVC APPROVED FOR THE USE.
 - 4.8.4. FMC - ZINC-PLATED STEEL OR CADMIUM-PLATED MALLEABLE IRON SCREW TYPE WITH INSULATED THROAT.
 - 4.8.5. LFMC - CADMIUM-PLATED MALLEABLE IRON OR STEEL COMPRESSION TYPE WITH INSULATED THROAT.

- 4.9. ALL OUTLET BOXES SHALL BE 4"x4"x1-1/2" DEEP MINIMUM.
- 4.10. ELECTRICAL CONTRACTOR SHALL WORK CLOSELY WITH THE MASONRY CONTRACTOR ON THE INSTALLATION OF ALL ELECTRICAL BOXES, CABINETS, RINGS, ETC. IN MASONRY WALLS. THE BOXES SHALL BE INSTALLED AT THE UNIFORM HEIGHTS CALLED FOR ON THE DRAWINGS AND SPECIFICATIONS. PROVIDE APPROPRIATE DEPTH MASONRY RINGS FOR ALL OUTLETS IN MASONRY WALLS TO INSURE PROPER CUTTING AND FITTING. THE FACE OF THE CABINETS, BOXES, RINGS, ETC. SHALL BE PLUMB AND FLUSH WITH THE FACE OF THE FINISH MATERIAL. ANY CABINET, OUTLET BOX, ETC. NOT MEETING THE ABOVE REQUIREMENT SHALL BE REMOVED AND REINSTALLED AT NO ADDITIONAL COST TO THE OWNER.
- 4.11. ALL SIDEWALKS AND PARKING LOT ASPHALT AREAS THAT ARE CUT DUE TO NEW ELECTRICAL SERVICES SHALL BE REPAIRED TO MATCH EXISTING.
- 4.12. ALL DIMENSIONS TO DEVICES AFF SHALL BE TO CENTERLINE UNLESS NOTED OTHERWISE.
- 4.13. WALL OUTLETS SHALL NOT BE INSTALLED BACK TO BACK.
- 4.14. COORDINATE LOCATIONS OF ELECTRICAL EQUIPMENT, DEVICES, OUTLETS, FIXTURES, ETC., WITH ARCHITECTURAL PLANS, ELEVATIONS AND REFLECTED CEILING PLANS PRIOR TO ROUGH-IN WORK.

5. GROUNDING & BONDING:
 - 5.1. PROVIDE AN INSULATED EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS.
 - 5.2. GROUND RODS SHALL BE 3/4"x20" COPPERCLAD STEEL.
 - 5.3. BELOW GRADE CONNECTIONS SHALL BE EXOTHERMIC TYPE.
 - 5.4. ALL CABLES SHALL BE COPPER, ALL BOLTED CONNECTIONS SHALL BE BRONZE.
 - 5.5. PROVIDE A #6AWG MINIMUM GROUND IN EMT FROM EACH TELCOM BACKBOARD TO THE MAIN ELECTRICAL SERVICE GROUND.
 - 5.6. WHERE AVAILABLE, BOND TO BUILDING STRUCTURAL STEEL, BUILDING FOUNDATION STEEL, METAL WATER SERVICE PIPING.
 - 5.7. PROVIDE THREE 20' GROUND RODS IN TRIANGLE ARRANGEMENT ON 20' CENTERS FOR MADE ELECTRODE SYSTEM. MEASURE RESISTANCE AND ENSURE <25 OHMS.

6. IDENTIFICATION:
 - 6.1. PROVIDE ENGRAVED 1"x3" PHENOLIC LABELS FOR ALL PANELBOARDS, SAFETY SWITCHES, TRANSFORMERS, CABINETS, ETC.
 - 6.2. PAINT THE RACEWAY SYSTEM COUPLINGS AND BOX COVERS ABOVE CEILINGS FOR THE FOLLOWING SYSTEMS AS FOLLOWS:
 - 6.2.1. 240 VOLT SYSTEMS - BLACK.
 - 6.2.2. AFTER PAINTING, WRITE THE CIRCUIT NUMBER (I.E. "LPA-34") ON ALL BRANCH CIRCUIT JUNCTION BOX COVERS ABOVE CEILING WITH WHITE MARKER.

7. GENERAL WIRING DEVICES:
 - 7.1. SWITCHES - SPECIFICATION GRADE, 20 AMP, COLOR BY ARCHITECT.
 - 7.2. RECEPTACLES - SPECIFICATION GRADE, 20 AMP, NEMA 5-20R, COLOR BY ARCHITECT.
 - 7.3. COVER PLATES - NYLON, COLOR BY ARCHITECT.
 - 7.4. SPECIAL RECEPTACLES - PER THE DRAWINGS, VERIFY WITH EQUIPMENT BEING SUPPLIED.
 - 7.5. APPROVED MANUFACTURERS - HUBBELL, LEVITON, EAGLE, PASS & SEYMOUR.

8. SAFETY SWITCHES:
 - 8.1. GENERAL DUTY, VISIBLE BLADE, LOCKABLE, QUICK-MAKE/QUICK-BREAK, HORSEPOWER RATED, FUSED WHERE INDICATED.
 - 8.2. PROVIDE WITH GROUND LUG KIT.
 - 8.3. INTERIOR - NEMA 1.
 - 8.4. EXTERIOR - NEMA 3R.
 - 8.5. APPROVED MANUFACTURERS - SQUARE D, GENERAL ELECTRIC, SIEMENS.

9. PANELBOARDS:
 - 9.1. FRONT ACCESSIBLE, BOLT-ON MOLDED CASE C/bs, COPPER PHASE & NEUTRAL BUSSING, COPPER GROUND BAR, FULLY RATED (SERIES RATING NOT ALLOWED).
 - 9.2. ENCLOSURES SHALL BE DOOR-IN-DOOR CONSTRUCTION.
 - 9.3. INTERIOR - NEMA 1.
 - 9.4. ALL INTERIOR PANELBOARDS ARE TO HAVE FOUR SPARE 3/4" CONDUITS INSTALLED TO AN ACCESSIBLE SPACE FOR FUTURE.
 - 9.5. EXTERIOR - NEMA 3R.
 - 9.6. PROVIDE TYPE-WRITTEN DIRECTORY IN CLEAR SLEEVE ON INSIDE OF DOOR.
 - 9.7. APPROVED MANUFACTURERS - SQUARE D, GENERAL ELECTRIC, SIEMENS.

10. LIGHTING:
 - 10.1. PROVIDE A 6'-0" MAXIMUM FLEXIBLE CONNECTION FROM EACH RECESSED LIGHTING FIXTURE TO JUNCTION BOX ABOVE CEILING.
 - 10.2. FOR FIXTURES IN LAY-IN CEILINGS, PROVIDE WIRE SUPPORTS AT OPPOSITE CORNERS OF FIXTURE SEPARATE FROM LAY-IN CEILING WIRE SUPPORTS.

ABBREVIATIONS

A	AMPS	MCM	THOUSAND CIRCULAR MILS
AC	ABOVE COUNTER	MH	MANHOLE
AF	AMP FRAME	MIN	MINIMUM
AFF	ABOVE FINISHED FLOOR	MISC	MISCELLANEOUS
AFG	ABOVE FINISHED GRADE	MLO	MAIN LUGS ONLY
AHU	AIR HANDLING UNIT	MNT	MOUNTING HEIGHT
AL	ALUMINUM	MTG	MOUNTING
ARCH	ARCHITECT OR ARCHITECTURAL	MTS	MANUAL TRANSFER SWITCH
AT	AMP TRIP	MV	MEDIUM VOLTAGE
ATS	AUTOMATIC TRANSFER SWITCH	N1	NEMA 1
ATU	AIR TERMINAL UNIT	N3R	NEMA 3R
AWG	AMERICAN WIRE GAUGE	N/A	NOT APPLICABLE
BAS	BUILDING AUTOMATION SYSTEM	NA	NOT APPLICABLE
BJ	BONDING JUMPER	NEC	NATIONAL ELECTRICAL CODE
BKR	CIRCUIT BREAKER	NESC	NATIONAL ELECTRICAL SAFETY CODE
BLDG	BUILDING	NEU	NEUTRAL
BOD	BASIS OF DESIGN	OCPD	OVERCURRENT PROTECTION DEVICE
C	CONDUIT	OFOI	OWNER FURNISHED OWNER INSTALLED
C/B	CIRCUIT BREAKER	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
CL	CURRENT LIMITING	OH	OVERHEAD
C/L	CENTERLINE	OHE	OVERHEAD ELECTRIC
CLG	CEILING	OHP	OVERHEAD PRIMARY
CKT	CIRCUIT	OHS	OVERHEAD SECONDARY
CT	CURRENT TRANSFORMER	PBD	PANELBOARD
CU	COPPER	PF	POWER FACTOR
DDC	DIRECT DIGITAL CONTROL	PNL	PANELBOARD
DEMO	DEMOLISH	PT	POTENTIAL TRANSFORMER
EC	ELECTRICAL CONTRACTOR	PWR	POWER
EGC	EQUIPMENT GROUNDING CONDUCTOR	RCPT	RECEPTACLE
ELEC	ELECTRICAL	REQD	REQUIRED
EMGB	ELECTRICAL MAIN GROUNDING BUSBAR	RM	ROOM
EF	EXHAUST FAN	RGS	RIGID GALVANIZED STEEL CONDUIT
EX	EXISTING TO REMAIN	RNC	RIGID NON-METALLIC CONDUIT
EXT	EXTERIOR	RVSS	REDUCED VOLTAGE SOLID STATE
EWC	ELECTRIC WATER COOLER	SA	SURGE ARRESTER
EMT	ELECTRICAL METALLIC TUBING	SCA	SHORT CIRCUIT AMPS
EQUIP	EQUIPMENT	SF	SUPPLY FAN
FMC	FLEXIBLE METAL CONDUIT	SPEC	SPECIFICATION
FACP	FIRE ALARM SYSTEM CONTROL PANEL	SWBD	SWITCHBOARD
FU	FUSE	SWGR	SWITCHGEAR
F/A	FIRE ALARM	TBB	TELECOMMUNICATIONS BONDING BACKBONE
FLA	FULL LOAD AMPS	TR	TELECOMMUNICATIONS ROOM
FLR	FLOOR	TGB	TELECOMMUNICATIONS GROUNDING BUSBAR
FVNR	FULL VOLTAGE NON-REVERSING	TMGB	TELECOMMUNICATIONS MAIN GROUNDING BUSBAR
GFI	GROUND FAULT INTERRUPTER	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
G	GROUND (OR GFI FOR RECEPTACLE SUBSCRIPT)	TYP	TYPICAL
GC	GENERAL CONTRACTOR	UFR	UNDERFLOOR RACEWAY
GND	GROUND	UG	UNDERGROUND
GEC	GROUNDING ELECTRODE CONDUCTOR	UGE	UNDERGROUND ELECTRIC
HH	HANDHOLE	UGP	UNDERGROUND PRIMARY
HOA	HAND-OFF-AUTOMATIC	UGS	UNDERGROUND SECONDARY
HP	HEAT PUMP OR HORSEPOWER	UL	UNDERWRITERS' LABORATORIES
HVAC	HEATING, VENTILATION & AIR-CONDITIONING	UNO	UNLESS NOTED OTHERWISE
IG	ISOLATED GROUND	UPS	UNINTERRUPTIBLE POWER SUPPLY
IMC	INTERMEDIATE METAL CONDUIT	V	VOLT
JB	JUNCTION BOX	VA	VOLT-AMPERES
k	KILO	VAR	VOLT-AMPERES REACTIVE
kAIC	KILO-AMPERE INTERRUPTING CAPABILITY	VAV	VARIABLE AIR VOLUME UNIT
kCML	THOUSAND CIRCULAR MILS	W	WATTS
LCP	LIGHTING CONTROL PANEL	WAO	WORK AREA OUTLET
LTG	LIGHTING	WP	WEATHERPROOF
LFMC	LIQUID TIGHT FLEXIBLE METAL CONDUIT	WSR	WITHSTAND RATING
LV	LOW VOLTAGE	XFMR	TRANSFORMER
MAX	MAXIMUM	XP	EXPLOSION PROOF
MCA	MINIMUM CIRCUIT AMPACITY	φ	PHASE
MCC	MOTOR CONTROL CENTER	72°	DEGREES
MCE	MAIN COMMUNICATIONS EQUIPMENT ROOM	Δ	DELTA
		Ω	OHMS

ELECTRICAL LEGEND

- GENERAL ELECTRICAL DEVICES:**
- ⚡ SINGLE POLE LIGHTING SWITCH, MOUNT 48" TO TOP OF BOX AFF UNLESS NOTED OTHERWISE. SUBSCRIPT INDICATES AS FOLLOWS:
M - TWO POLE MOTOR RATED SWITCH MOUNTED AT THE EQUIPMENT. PROVIDE PHENOLIC LABEL.
 - ⚡ DUPLEX RECEPTACLE NEMA 5-20R, MOUNT 18" AFF UNLESS NOTED OTHERWISE. VERIFY DUPLEX MOUNTING REQUIREMENTS WITH ARCHITECTURAL DRAWINGS PRIOR TO ROUGH-IN. SUBSCRIPT INDICATES AS FOLLOWS:
G - GROUND FAULT CIRCUIT INTERRUPTER TYPE.
WP - GFI DEVICE WITH DIECAST WEATHERPROOF BACKBOX & DIECAST WEATHERPROOF (IN-USE) COVERPLATE. IN EXTERIOR LOCATIONS MOUNT 30" AFG. WEATHERPROOF OUTLET BOX COVERPLATES ARE TO BE LISTED AND IDENTIFIED AS "EXTRA-DUTY".
84" - MOUNTING HEIGHT OF DEVICE AFF.
21 - # INDICATES PANELBOARD CKT NUMBER
 - ⚡ DUPLEX RECEPTACLE MOUNTED 42" AFF. OR MOUNT 7" ABOVE COUNTER. VERIFY COUNTER HEIGHT PRIOR TO ROUGH-IN. ORIENT WITH LONG AXIS HORIZONTAL ABOVE COUNTERS.
 - ⚡ QUADRAPLEX RECEPTACLE (TWO NEMA 5-20R) MOUNTED 18" AFF. UNLESS NOTED OTHERWISE.

- LIGHTING CONTROL EQUIPMENT:**
- ⌚ ACUITY nDTC DIGITAL TIME CLOCK (OR APPROVED EQUAL).
 - ⌚ PROGRAMMABLE TIME CLOCK FOR MAG LOCK DOOR CONTROLS.

- OCCUPANCY SENSORS:**
- Ⓓ WALL MOUNTED LINE VOLTAGE DUAL TECHNOLOGY SWITCH WITH SINGLE RELAY. MOUNT 48" AFF UNLESS NOTED OTHERWISE. SWITCH SHALL BE PROGRAMMED TO BE MANUAL ON.
 - Ⓓ WALL MOUNTED LINE VOLTAGE DUAL TECHNOLOGY SWITCH WITH DUAL RELAYS. EACH RELAY IS TO HAVE INDEPENDENT DELAY CONTROL. MOUNT 48" AFF UNLESS NOTED OTHERWISE. SWITCH SHALL BE PROGRAMMED TO BE MANUAL ON.
 - Ⓙ CEILING MOUNTED LOW VOLTAGE 360° DUAL TECHNOLOGY (PASSIVE INFRARED & ULTRASONIC) OCCUPANCY SENSOR.
 - Ⓙ DIMMING POWER PACK. PROVIDE WITH NEMA 1 ENCLOSURE.

LIGHTING FIXTURES:

SEE LIGHTING FIXTURE SCHEDULE FOR SYMBOLS AND DESCRIPTIONS. THE FIXTURE MARK IN AN ENCLOSED SPACE WITH SIMILAR FIXTURES WILL APPLY TO ALL FIXTURES IN THE SPACE.

- MISCELLANEOUS EQUIPMENT:**
- ⚡ EXHAUST FAN.
 - TT COPPER GROUNDING BUSBAR WITH STANDOFF INSULATORS. UNLESS INDICATED OTHERWISE PROVIDE WITH #6AWG IN EMT FROM BUSBAR TO EMGB. MOUNT BUSBAR 12" AFF.
 - Ⓜ JUNCTION BOX.
 - Ⓜ ELECTRICAL CONNECTION TO EQUIPMENT. VERIFY LOCATION WITH EQUIPMENT PROVIDER.

- DISTRIBUTION & POWER EQUIPMENT:**
- Ⓜ PANELBOARD, MOUNT AS INDICATED. SEE PANELBOARD SCHEDULES.
 - Ⓜ NEC 110.26(A) WORKING CLEARANCE.
 - Ⓜ VARIABLE FREQUENCY DRIVE W/INTEGRAL DISCONNECT. PROVIDED BY DIVISION 15, INSTALLED BY DIVISION 16.
 - Ⓜ NON-FUSED GENERAL DUTY SAFETY SWITCH. SIZE FOR LOAD BEING SERVED.
 - Ⓜ FUSED GENERAL DUTY SAFETY SWITCH. SIZE FOR LOAD BEING SERVED.

- OTHER:**
- Ⓜ CIRCUIT RUN CONCEALED ABOVE CEILING OR IN WALL.
 - Ⓜ CIRCUIT RUN CONCEALED IN OR BELOW FLOOR SLAB OR UNDERGROUND.
 - Ⓜ HOMERUN TO PANELBOARD. ANY CIRCUIT WITHOUT FURTHER DESIGNATION SHALL BE 2#12, #12G, 3/4" C. TICK MARKS INDICATE # OF CONDUCTORS (EGC NOT SHOWN). MINIMUM SIZE ON 120V HOMERUNS GREATER THAN 50 FEET SHALL BE #10 AWG. MINIMUM SIZE ON 120V HOMERUNS GREATER THAN 100 FEET SHALL BE #8 AWG. MINIMUM SIZE ON 120V HOMERUNS GREATER THAN 160 FEET SHALL BE #6 AWG. MINIMUM SIZE ON 277V HOMERUNS GREATER THAN 100 FEET SHALL BE #10 AWG. INCREASE CONDUIT SIZE AS REQUIRED PER NEC. UNDERLINED TEXT INDICATES CIRCUIT DESIGNATION.
 - Ⓜ MECHANICAL EQUIPMENT IDENTIFICATION TAG. SEE MECHANICAL EQUIPMENT ELECTRICAL SCHEDULE.
 - Ⓜ LIGHT FIXTURE IDENTIFICATION TAG. SEE LIGHT FIXTURE SCHEDULE FOR SYMBOLS & DETAILS.
 - Ⓜ SHEET NOTE TAG.
 - Ⓜ PANELBOARD, SWITCHBOARD, TRANSFORMER & ELECTRICAL EQUIPMENT IDENTIFICATION TAG.

ELECTRICAL NOTES

- ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE.
- CONDUIT ROUTINGS AND DEVICE / EQUIPMENT LOCATIONS SHOWN ARE DIAGRAMMATIC ONLY. CONTRACTOR SHALL FIELD ROUTE AND LOCATE AS REQUIRED. CONDUIT ROUTINGS SHALL BE NORTH / SOUTH OR EAST/WEST.
- ALL ELECTRICAL EQUIPMENT AND DEVICES SHALL BE PROVIDED WITH SUITABLE PHENOLIC NAMEPLATES.
- FOR OTHER THAN LIGHTING FIXTURES, CATALOG NUMBERS AND MANUFACTURERS SHOWN ARE TO INDICATE DEVICE, QUALITY, AND TYPE OF ITEM DESIRED ONLY. ANY SUBSTITUTION ON THE LIGHTING FIXTURES MUST BE PRE-APPROVED TWO WEEKS PRIOR TO BID (OR AS STATED BY THE ARCHITECT / OWNER).
- THE LOADS SHOWN FOR APPLIANCES AND EQUIPMENT ARE BASED ON INFORMATION PROVIDED DURING THE DESIGN PHASE. THE CONTRACTOR SHALL VERIFY ALL APPLIANCE LOADS PRIOR TO ROUGH IN AND RUNNING THE CIRCUIT. THE MINIMUM CIRCUIT REQUIREMENTS SHALL BE BASED ON THE APPLIANCE NAMEPLATE VALUE OR CODE REQUIREMENTS, WHICHEVER IS MORE STRINGENT. ADDITIONAL COMPENSATION WILL NOT BE ALLOWED FOR APPLIANCE MODIFICATIONS BY THE CONTRACTOR.
- COORDINATE LOCATIONS OF ELECTRICAL EQUIPMENT, DEVICES, OUTLETS, FIXTURES, ETC., WITH ARCHITECTURAL PLANS, ELEVATIONS AND REFLECTED CEILING PLANS PRIOR TO ROUGH-IN WORK.
- ALL CONDUITS NOT LOCATED UNDER SLAB SHALL HAVE A MINIMUM BURIAL DEPTH OF 36" UNLESS NOTED OTHERWISE.
- CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES PRIOR TO INSTALLATION. REFER TO ARCHITECTURAL, LANDSCAPE, ETC. DRAWINGS FOR EXACT LOCATION AND SIZE OF EQUIPMENT WHICH ARE PROVIDED BY OTHERS AND CONNECTED BY ELECTRICAL.
- RECEPTACLES, SWITCHES COLOR SHALL BE SELECTED BY THE OWNER / ARCHITECT FROM STANDARD COLORS. ALL COVER PLATES SHALL BE SELECTED BY THE ARCHITECT.
- CONDUITS LEAVING OR ENTERING BUILDING SHALL BE SEALED PER N.E.C. TO PREVENT ENTRANCE OF MOISTURE.
- ALL DIMENSIONS TO DEVICES A.F.F. SHALL BE TO CENTERLINE UNLESS NOTED OTHERWISE.
- WORKING SPACE OF 36" FOR 120/240 SYSTEMS SHALL BE MAINTAINED IN FRONT OF ALL ELECTRICAL PANELS AND DEVICES.
- ALL SIDEWALKS AND PARKING LOT ASPHALT AREAS THAT ARE CUT DUE TO NEW ELECTRICAL SERVICES SHALL BE REPAIRED TO MATCH EXISTING.
- FINAL CONNECTION TO ALL EQUIPMENT IS SHOWN DIAGRAMMATIC. PROVIDE FINAL CONNECTION AS REQUIRED PER MANUFACTURER OF EQUIPMENT.
- THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL CHARGES, PERMITS, FEES, ETC. RELATED TO THE CONSTRUCTION (THIS INCLUDES ALL ALABAMA POWER COMPANY FEES AND CHARGES FOR THE NEW SERVICE).

LIGHTING FIXTURE SCHEDULE								
MARK	MANUFACTURER AND CATALOG NUMBER	LAMPS			TOTAL WATTS	VOLTAGE	MOUNTING	NOTES
		TYPE	#	WATTS				
PL	KENALL MLHA5S-B48-R-MW-PP-45L35K-CC-DV-DL-CMB	LED	N/A	45	45	MVOLT	SURFACE	LED SURFACE MOUNTED FIXTURE WITH EMERGENCY BATTERY BACK UP AS INDICATED ON PLANS
FP	NUVO 65-326	LED	N/A	50	50	MVOLT	SURFACE	2X4 LED FLAT PANEL FIXTURE WITH EMERGENCY BATTERY BACK UP AS INDICATED ON PLANS
EMEX	LITHONIA LHQMLDRHOSD	LED	N/A	4	4	MVOLT	SURFACE	LED EMERGENCY / EXIT COMBO WITH EMERGENCY BATTERY BACK UP
WL2	KENALL CC-2-9-25L35K-DV-6	LED	N/A	25	25	MVOLT	SURFACE CORNER	LED VANDAL RESISTANT FIXTURE WITH EMERGENCY BATTERY BACK UP
WPX	LITHONIA WPX1LED240KMVOLTDDBXD	LED	N/A	24	24	MVOLT	SURFACE 8'-6" AFF	LED EXTERIOR EGRESS FIXTURE WITH EMERGENCY BATTERY BACK UP
WL4	TOPAZ FL440W40KD87	LED	N/A	40	40	MVOLT	WALL / CEILING 8' AFF	4' UTILITY LED FIXTURE WALL MOUNT IN SPACES WITH NO CEILING
NOTES	FIXTURES WITH HALF FILLED IN CENTER SHALL BE PROVIDED WITH AN EMERGENCY BALLAST, 1100 LUMENS OR THE MAXIMUM AVAILABLE FOR THE FIXTURE.							
	THE ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL MOUNTING HARDWARE AS REQUIRED FOR A COMPLETE INSTALLATION.							
	ALL FIXTURES ARE TO BE REVIEWED AND APPROVED BY OWNER PRIOR TO ORDER.							

COMcheck Software Version COMcheckWeb Interior Lighting Compliance Certificate

Project Information

Energy Code: 2015 IECC
Project Title: MIMS CONCESSION BUILDING
Project Type: New Construction

Construction Site: _____ Owner/Agent: _____ Designer/Contractor: _____

Additional Efficiency Package(s)
Credits: 1.0 Required 1.0 Proposed
Reduced Lighting Power, 1.0 credit

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts
1-Office	817	0.74	603
Total Allowed Watts =			603

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixture	D Fixture Watt.	E (C X D)
1-Office				
LED: WL2: Other:	1	7	25	175
LED: WL4: Other:	1	6	40	240
LED: FP: Other:	1	3	50	150
Total Proposed Watts =				565

Interior Lighting PASSES: Design 6% better than code

Interior Lighting Compliance Statement
Compliance Statement: The proposed interior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2015 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Name - Title _____ Signature _____ Date _____

Project Title: MIMS CONCESSION BUILDING Report date: 10/09/24
Data filename: _____ Page 1 of 5

COMcheck Software Version COMcheckWeb Exterior Lighting Compliance Certificate

Project Information

Energy Code: 2015 IECC
Project Title: MIMS CONCESSION BUILDING
Project Type: New Construction
Exterior Lighting Zone: 2 (Residentially zoned area (L22))

Construction Site: _____ Owner/Agent: _____ Designer/Contractor: _____

Allowed Exterior Lighting Power

A Area/Surface Category	B Quantity	C Allowed Watts /	D Tradable Wattage	E Allowed Watts (B X C)
Entry canopy	1698 ft2	0.25	Yes	424
Pedestrian tunnel	320 ft2	0.15	Yes	48
Total Tradable Watts (a) =				472
Total Allowed Watts =				472
Total Allowed Supplemental Watts (b) =				600

(a) Wattage tradeoffs are only allowed between tradable areas/surfaces.
(b) A supplemental allowance equal to 600 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Proposed Exterior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixture	D Fixture Watt.	E (C X D)
Entry canopy (1698 ft2): Tradable Wattage				
LED: WPX: Other:	1	8	24	192
Pedestrian tunnel (320 ft2): Tradable Wattage				
LED: WPX: Other:	1	4	24	96
Total Tradable Proposed Watts =				288

Exterior Lighting PASSES: Design 73% better than code

Exterior Lighting Compliance Statement
Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed exterior lighting systems have been designed to meet the 2015 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

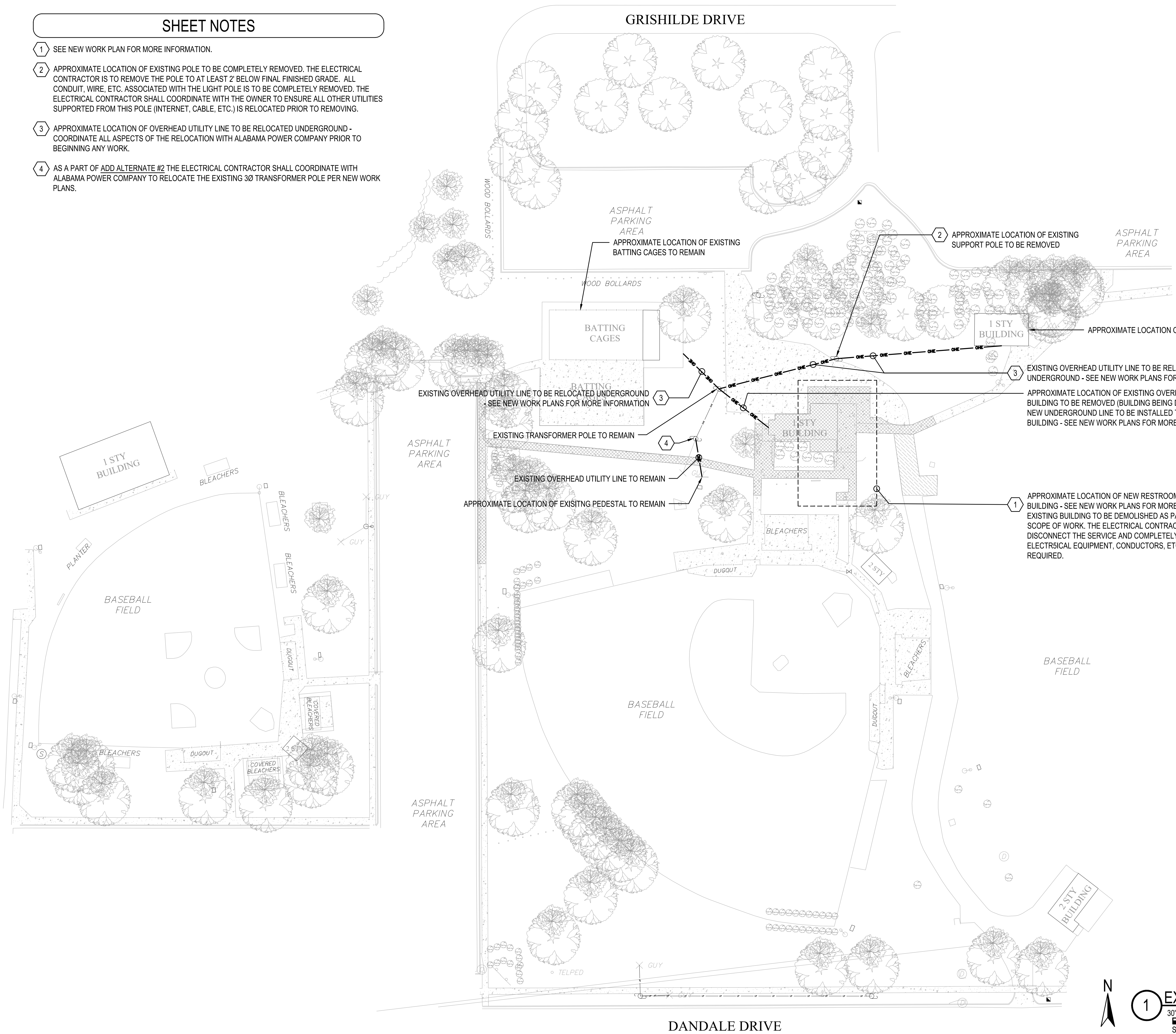
Name - Title _____ Signature _____ Date _____

Project Title: MIMS CONCESSION BUILDING Report date: 10/09/24
Data filename: _____ Page 2 of 5



SHEET NOTES

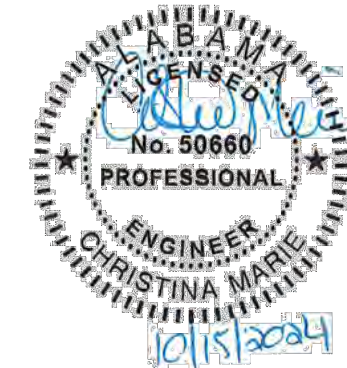
- 1 SEE NEW WORK PLAN FOR MORE INFORMATION.
- 2 APPROXIMATE LOCATION OF EXISTING POLE TO BE COMPLETELY REMOVED. THE ELECTRICAL CONTRACTOR IS TO REMOVE THE POLE TO AT LEAST 2' BELOW FINAL FINISHED GRADE. ALL CONDUIT, WIRE, ETC. ASSOCIATED WITH THE LIGHT POLE IS TO BE COMPLETELY REMOVED. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE OWNER TO ENSURE ALL OTHER UTILITIES SUPPORTED FROM THIS POLE (INTERNET, CABLE, ETC.) IS RELOCATED PRIOR TO REMOVING.
- 3 APPROXIMATE LOCATION OF OVERHEAD UTILITY LINE TO BE RELOCATED UNDERGROUND - COORDINATE ALL ASPECTS OF THE RELOCATION WITH ALABAMA POWER COMPANY PRIOR TO BEGINNING ANY WORK.
- 4 AS A PART OF ADD ALTERNATE #2 THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH ALABAMA POWER COMPANY TO RELOCATE THE EXISTING 3Ø TRANSFORMER POLE PER NEW WORK PLANS.



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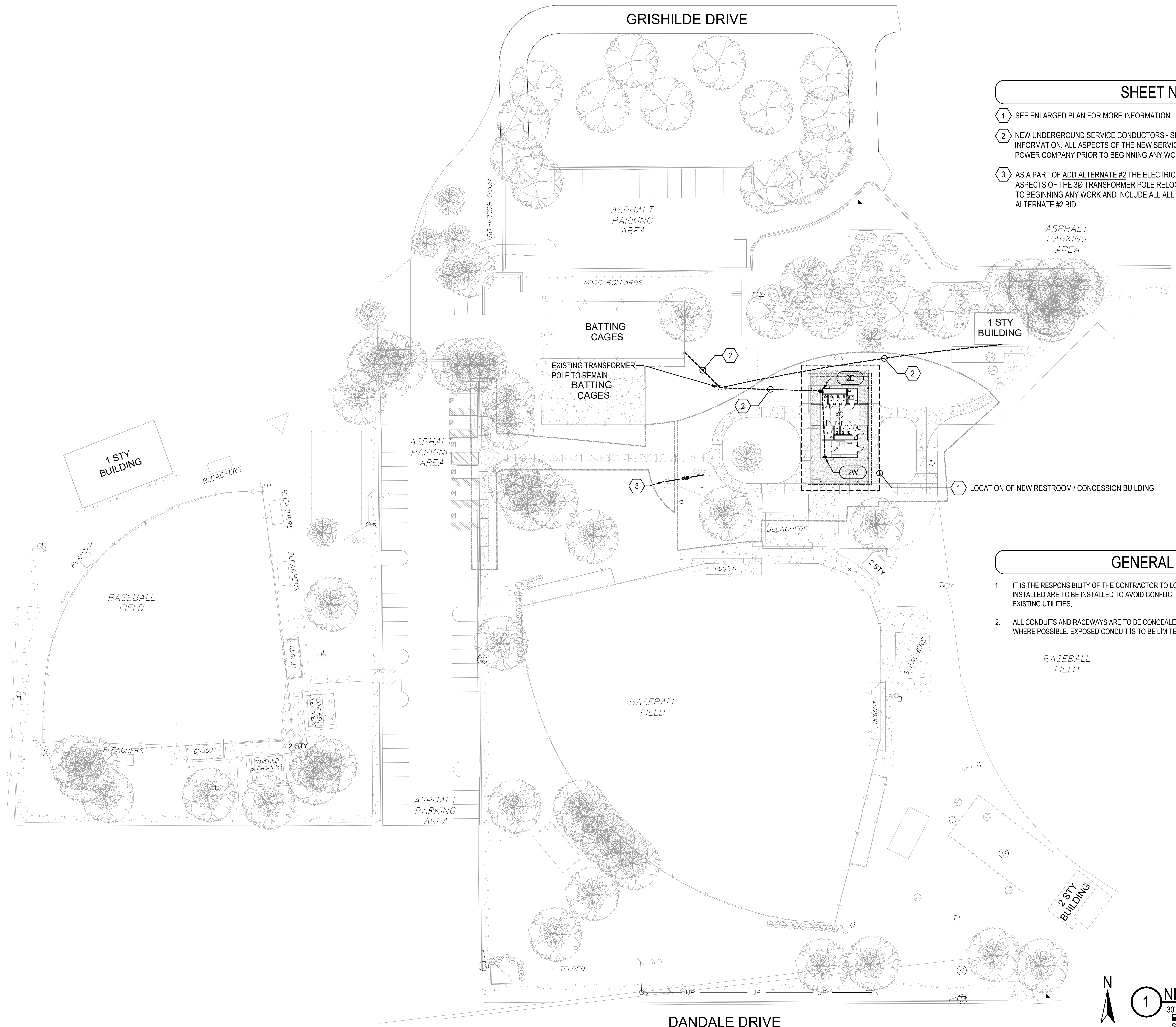
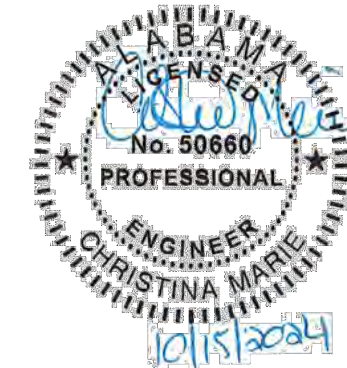
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EXISTING ELECTRICAL SITE PLAN FOR:
CITY OF MOBILE - MIMS PARK
 SCALE: AS NOTED Mobile, AL



1 EXISTING SITE PLAN
 SCALE: 1"=30'-0"

DATE: 10/15/2024
E3.0



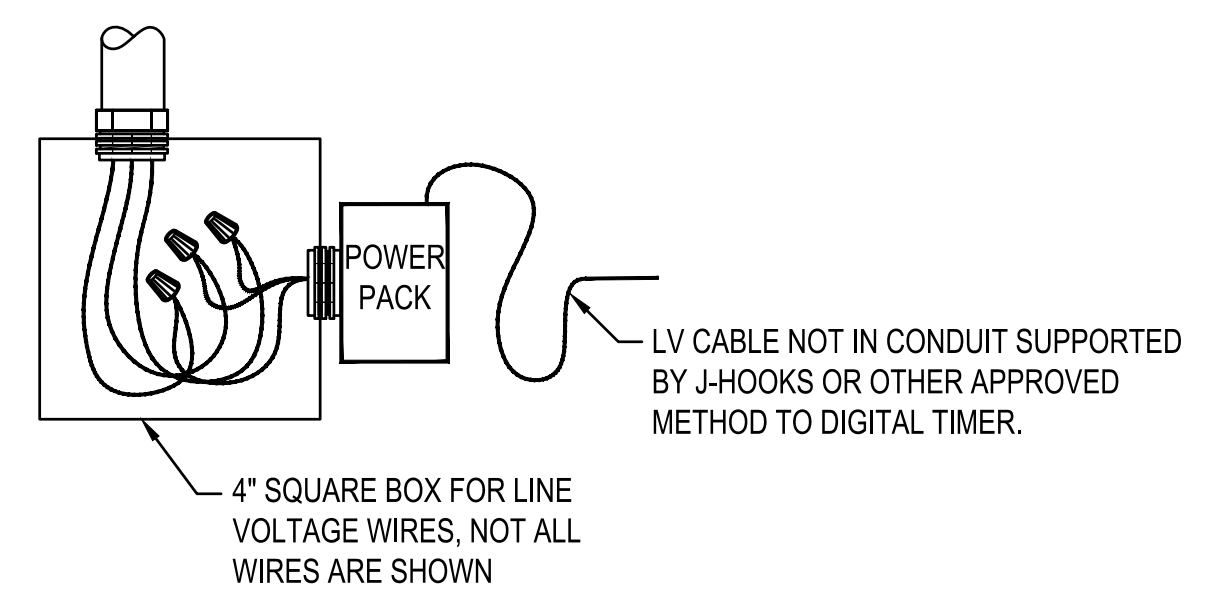
SHEET NOTES

- 1 SEE ENLARGED PLAN FOR MORE INFORMATION.
- 2 NEW UNDERGROUND SERVICE CONDUCTORS - SEE SINGLE LINE RISER DIAGRAM FOR MORE INFORMATION. ALL ASPECTS OF THE NEW SERVICE IS TO BE COORDINATED WITH ALABAMA POWER COMPANY PRIOR TO BEGINNING ANY WORK.
- 3 AS A PART OF ADD ALTERNATE #2 THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL ASPECTS OF THE 3Ø TRANSFORMER POLE RELOCATION WITH ALABAMA POWER COMPANY PRIOR TO BEGINNING ANY WORK AND INCLUDE ALL ALL FEES FOR THIS RELOCATION IN THE ADD ALTERNATE #2 BID.

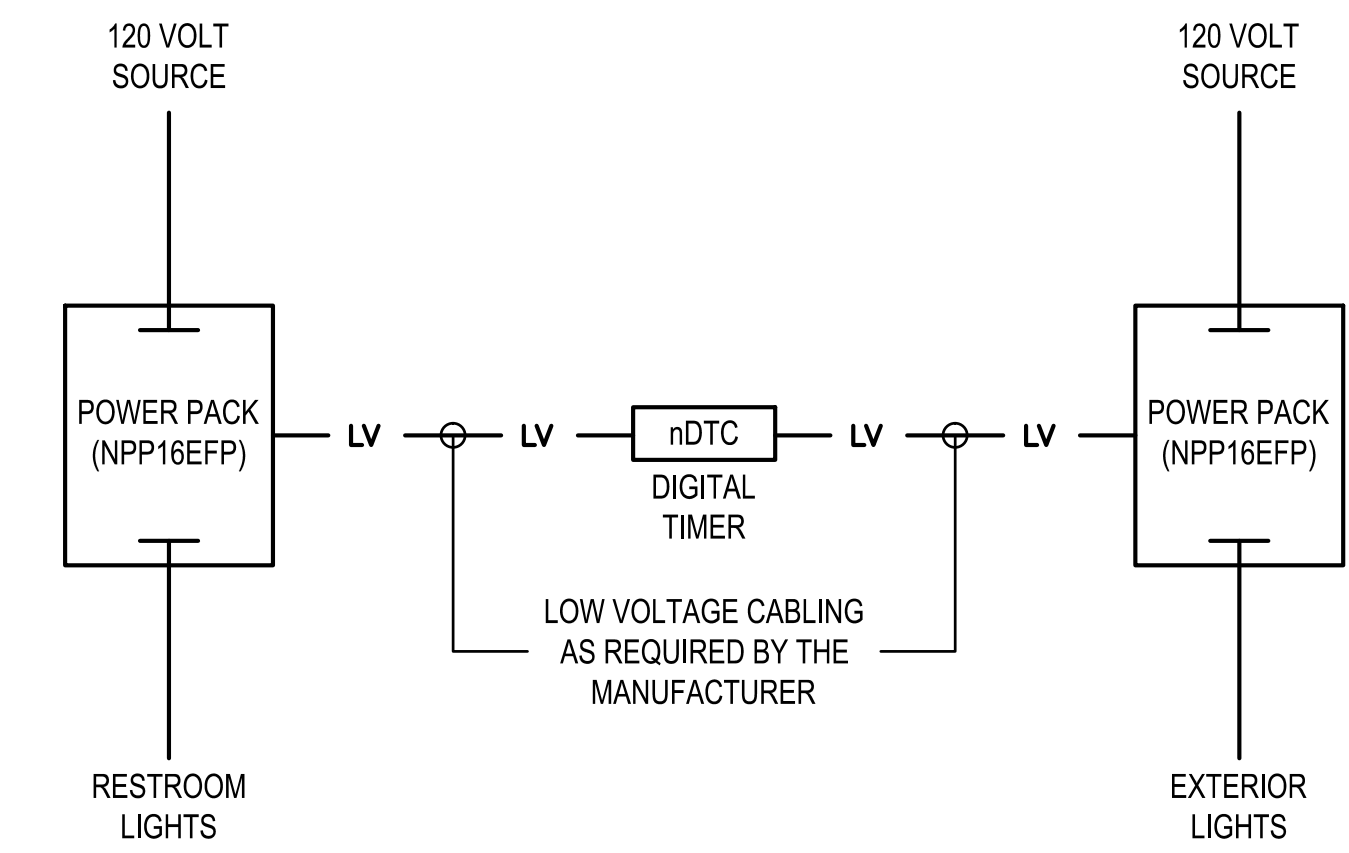
GENERAL NOTES

- 1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL UNDERGROUND UTILITIES. NEW CONDUITS INSTALLED ARE TO BE INSTALLED TO AVOID CONFLICT WITH EXISTING TREE ROOT SYSTEMS AS WELL AS EXISTING UTILITIES.
- 2. ALL CONDUITS AND RACEWAYS ARE TO BE CONCEALED UNDERGROUND AND WITHIN THE STRUCTURE WHERE POSSIBLE. EXPOSED CONDUIT IS TO BE LIMITED; ALL EXPOSED CONDUIT TO BE GRG.

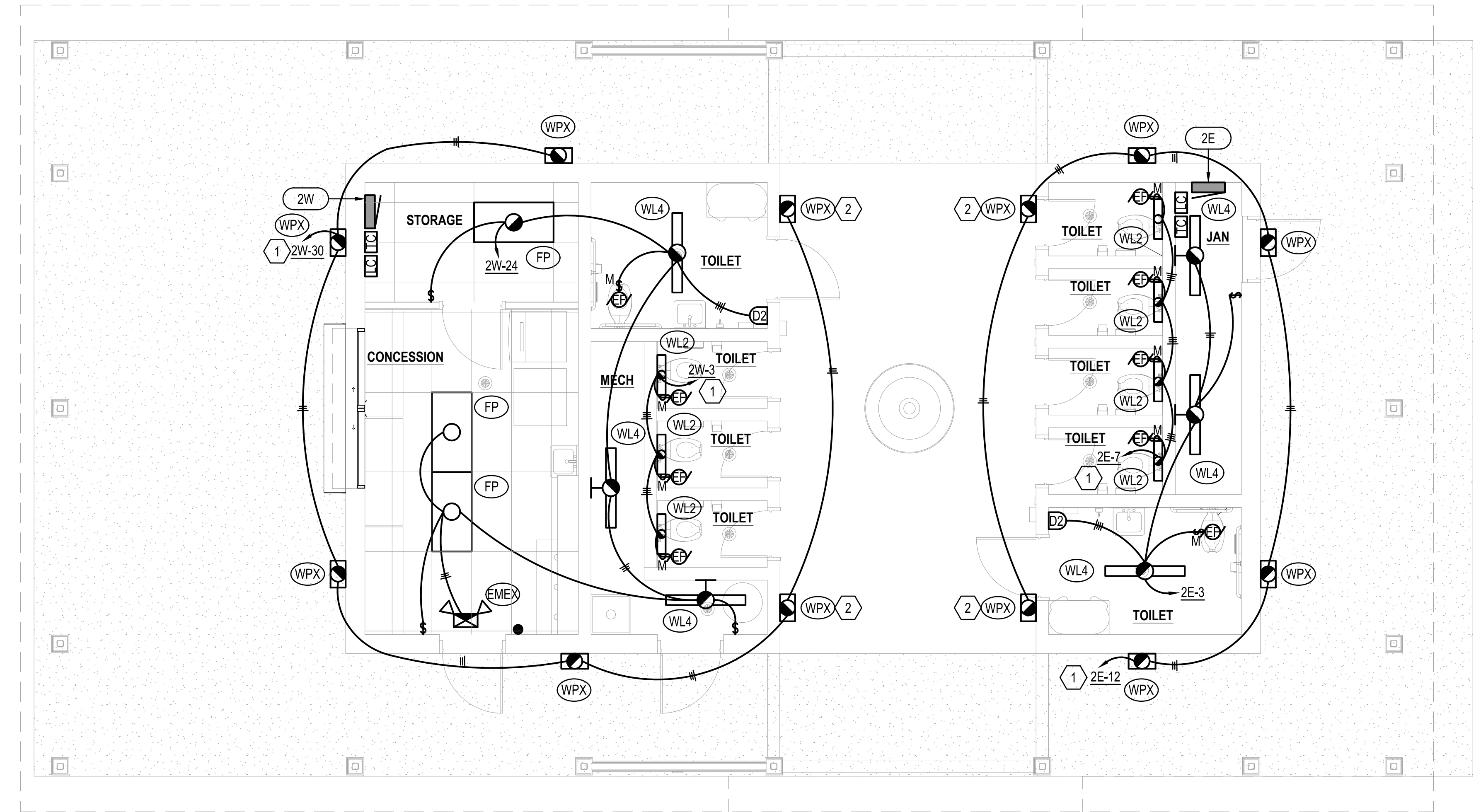
1 NEW WORK SITE PLAN
 SCALE: 1"=30'-0"



2 DIGITAL TIMER POWER PACK DETAIL
 NOT TO SCALE



3 DIGITAL TIMECLOCK DIAGRAM
 NOT TO SCALE
 SYMBOL: 



1 NEW WORK LIGHTING PLAN
 SCALE: 1/4"=1'-0"

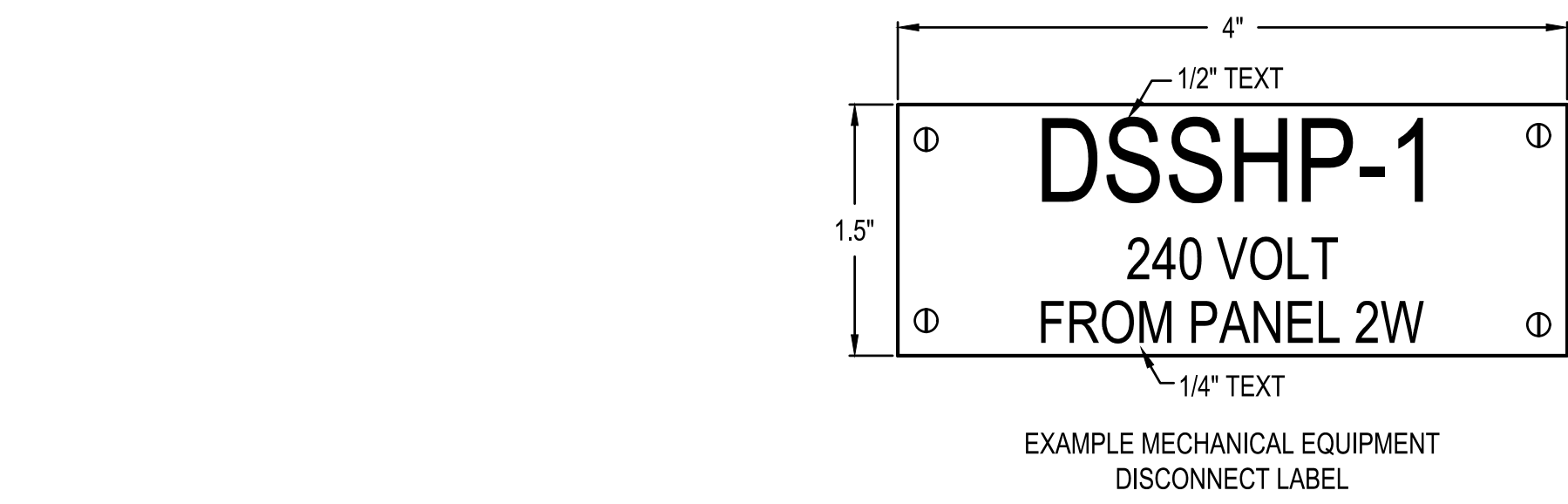
SHEET NOTES

- THIS CIRCUIT SHALL BE ROUTED THROUGH THE DIGITAL TIMER. THE TIME CLOCK SHALL BE PROGRAMMED TO TURN THE LIGHTS "ON" AND "OFF" AT THE OWNER'S DESIGNATED TIME. PROVIDE WITH nPP16EFP RELAY SWITCHING POWER PACK OR APPROVED EQUAL AS RECOMMENDED BY THE MANUFACTURER. SEE DETAIL THIS SHEET.
- THE FINAL MOUNTING HEIGHT OF THIS WPX FIXTURE TO BE COORDINATED WITH ARCHITECT PRIOR TO ROUGH IN TO AVOID CONFLICT WITH BEAM. ADJUST LOCATION AS DIRECTED BY THE ARCHITECT, LANDSCAPE ARCHITECT AND OWNER.

GENERAL NOTES

- COORDINATE INTERLOCK OF EXHAUST FANS WITH LIGHTING CIRCUIT WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH IN.
- ALL CONDUITS AND RACEWAYS ARE TO BE CONCEALED UNDERGROUND AND WITHIN THE STRUCTURE WHERE POSSIBLE. EXPOSED CONDUIT IS TO BE LIMITED; ALL EXPOSED CONDUIT TO BE GR.



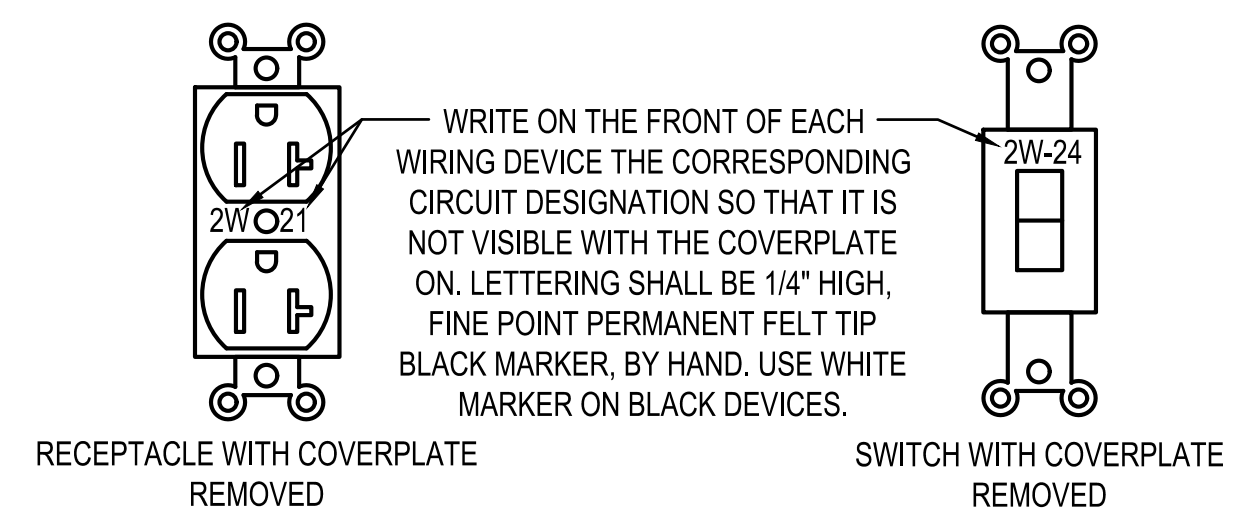


EXAMPLE MECHANICAL EQUIPMENT DISCONNECT LABEL

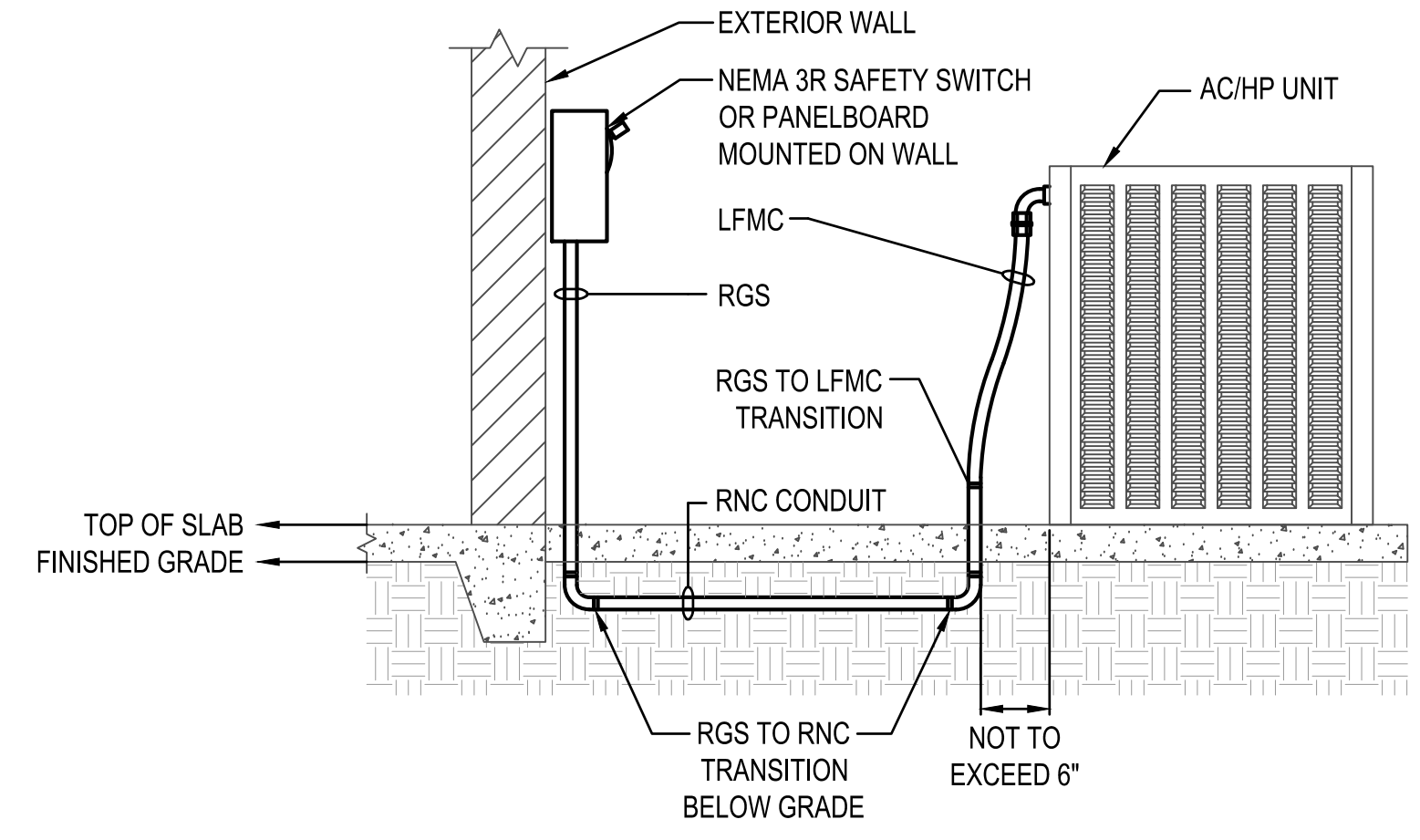
EXAMPLE PANELBOARD/SWITCHBOARD LABEL

ENGRAVED PLASTIC TAG WITH BLACK LETTERS ON WHITE BACKGROUND (RED BACKGROUND FOR EMERGENCY EQUIPMENT). TAG SHALL HAVE ALL EDGES BEVELED AND SMOOTH. SECURE TAG WITH 4 CHROME (STAINLESS STEEL FOR WET OR DAMP LOCATIONS) SCREWS. ADHESIVE BACKING, TAPE, ETC IS NOT ALLOWED. DIMENSIONS ARE MINIMUM, TAG SHALL BE LARGER AS REQUIRED TO FIT APPROPRIATE TEXT.

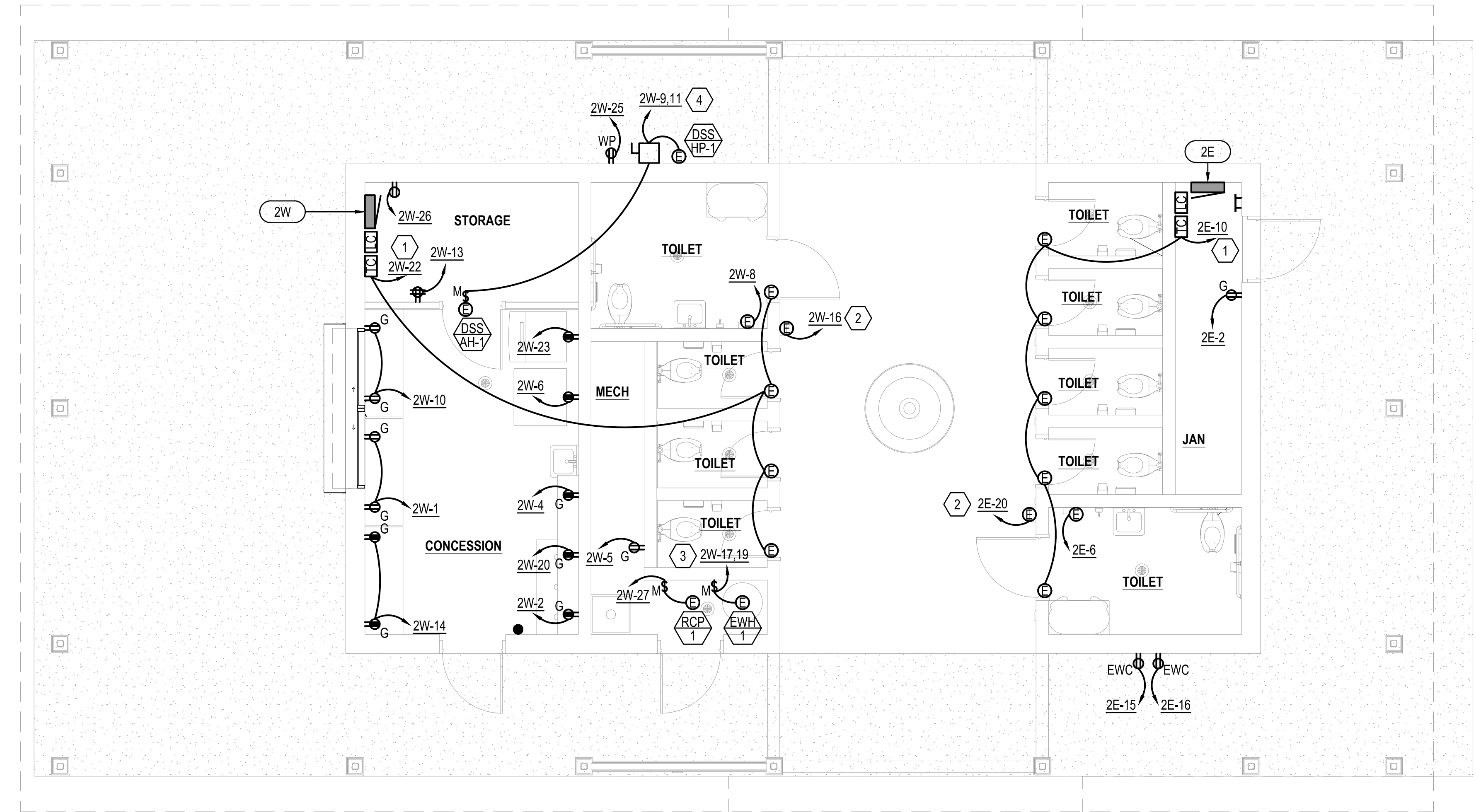
2 TYPICAL EQUIPMENT LABELING DETAIL
 NOT TO SCALE



3 WIRING DEVICE LABEL DETAIL
 NOT TO SCALE



4 TYPICAL EXTERIOR DSSHP CONNECTION DETAIL
 NOT TO SCALE



1 NEW WORK POWER PLAN
 SCALE: 1/4"=1'-0"

SHEET NOTES

- 1 DOOR CONTROLS. COORDINATE THE INSTALLATION / REQUIREMENTS WITH THE ARCHITECT PRIOR TO ROUGH-IN. THE CONTRACTOR SHALL PROVIDE AND INSTALL A NEW 20/1 BREAKER IN NEW PANEL TO SERVE THE NEW DOOR CONTROLS. DOOR TIMER CONTROLS SHALL BE INSTALLED IN THE MECHANICAL ROOM. FINAL LOCATION AND PROGRAMMING OF DOOR TIMER CONTROLS TO BE COORDINATED WITH OWNER PRIOR TO ROUGH IN.
- 2 NEW HAND DRYER. COORDINATE THE INSTALLATION / POWER REQUIREMENTS WITH THE ARCHITECT / EQUIPMENT PROVIDER PRIOR TO ROUGH-IN.
- 3 NEW ELECTRIC WATER HEATER. COORDINATE THE INSTALLATION / POWER REQUIREMENTS WITH THE ARCHITECT / EQUIPMENT PROVIDER PRIOR TO ROUGH-IN.
- 4 NEW DUCTLESS SPLIT SYSTEM UNIT. COORDINATE THE INSTALLATION / POWER REQUIREMENTS WITH THE ARCHITECT / EQUIPMENT PROVIDER PRIOR TO ROUGH-IN. THE ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL CABLING IN 1" CONDUIT AS RECOMMENDED BY THE MANUFACTURER. THE UNIT IS MOUNTED BEHIND A SCREEN WALL AT 9' A.F.F. - DISCONNECT AND SERVICE RECEPTACLE ARE TO BE MOUNTED UP AT THE UNIT PLATFORM. FIELD COORDINATE MOUNTING HEIGHT WITH MECHANICAL CONTRACTOR AND FINAL LOCATION OF UNIT PRIOR TO ROUGH IN.

GENERAL NOTES

- 1. ALL CONDUITS AND RACEWAYS ARE TO BE CONCEALED UNDERGROUND AND WITHIN THE STRUCTURE WHERE POSSIBLE. EXPOSED CONDUIT IS TO BE LIMITED; ALL EXPOSED CONDUIT TO BE GR.



PANELBOARD SCHEDULE

MARK: PANEL 2W												
CKT #	LOAD DESCRIPTION	BREAKER		PHASE (kVA)		PHASE (kVA)		BREAKER		LOAD DESCRIPTION		CKT #
		P	TRIP	A	B	A	B	TRIP	P			
1	CONCESSION RECEPTACLES	1	20	0.4	1.0	20	1			CONCESSION RECEPTACLES	2	
3	INTERIOR LIGHTING	1	20	0.3	1.0	20	1			CONCESSION RECEPTACLES	4	
5	SERVICE RECEPTACLE	1	20	0.2	1.0	20	1			CONCESSION RECEPTACLES *	6	
7	SPARE	1	20		1.5	20	1			HAND DRYER *	8	
9	DSSH-1/	2	30	1.8	0.4	20	1			CONCESSION RECEPTACLES	10	
11	DSSAH-1			1.8		20	1			SPARE	12	
13	POWER FOR FUTURE NVR	1	20	0.5	0.4	20	1			CONCESSION RECEPTACLES	14	
15	SPARE	1	20			20	1			SPARE	16	
17	EW-1	2	30	2.3	1.5	20	1			HAND DRYER *	18	
19				2.3	1.0	20	1			CONCESSION RECEPTACLES	20	
21	SPARE	1	20		0.2	20	1			DOOR MAG LOCKS	22	
23	CONCESSION RECEPTACLES *	1	20	1.0	0.3	20	1			INTERIOR LIGHTING	24	
25	SERVICE RECEPTACLE	1	20	0.2	0.2	20	1			STORAGE RECEPTACLE	26	
27	RCP-1	1	20	0.7		20	1			SPARE	28	
29	SPARE	1	20		0.2	20	1			EXTERIOR LIGHTS	30	

5.3 6.1 4.8 3.8

TOTAL (kVA) ØA 10.1 ØB 10.0 HIGH PHASE (AMPS) 84.3
 TOTAL CONNECTED LOAD (kVA) 20.1 TOTAL LOAD (AMPS) 83.7

CREATE A DIRECTORY TO INDICATE INSTALLED LOADS. INDICATE LOAD TYPE (REC, LTG, AHU-1, ETC.) & ROOM NUMBERS FOR EVERY BRANCH CIRCUIT.
 * PROVIDE THIS CIRCUIT WITH A GFCI BREAKER.

MECHANICAL EQUIPMENT ELECTRICAL SCHEDULE

MARK	ITEM	VOLTAGE/Ø	MCA	LOAD	MEANS OF DISCONNECT*	C/B TRIP (AMPS)	CIRCUIT			SERVING PANEL	NOTES
							Ø	GROUND	CONDUIT		
EW-1	ELECTRIC WATER HEATER	240/1	25	4.5 KW	TSM	30	2#10	#10	3/4"C	2W	
RCP-1	RECIRCULATION PUMP	120/1	20	1/5 HP	TSM	20	2#12	#12	3/4"C	2W	
EF-1	EXHAUST FAN	120/1	20	89 WATTS	TSM	20	2#12	#12	3/4"C	2W/2E	
DSS	DUCTLESS SPLIT SYSTEM	240/1	30	3.6 KVA	TSM	30	2#10	#10	1/2"C	2W	

NOTES
 *N1=NEMA 1, N3R=NEMA 3R, SS=SAFETY SWITCH, FSS=FUSED SAFETY SWITCH, C/B=SERVING C/B, TS=MANUAL TOGGLE SWITCH, TSM=MOTOR RATED TS
 1. DISCONNECT INTEGRAL TO EQUIPMENT BY DIVISION 15.
 2. PROVIDE FVNR ENCLOSED MAGNETIC MOTOR STARTER NEMA SIZED AS REQUIRED.
 3. PROVIDE COMBINATION FVNR ENCLOSED MAGNETIC MOTOR STARTER NEMA SIZED AS REQUIRED.
 4. PROVIDE MOTOR RATED POWER RELAY IN NEMA 1 ENCLOSURE FOR CONTROL OF EQUIPMENT.
 5. VFD W/INTEGRAL DISCONNECT PROVIDED BY DIVISION 15, CONNECTED BY DIVISION 16.
 6. PROVIDE AUXILIARY CONTACT IN SAFETY SWITCH. SEE DETAIL.

PANELBOARD INFORMATION SCHEDULE

MARK	ENCLOSURE TYPE	MOUNTING STYLE	VOLTAGE	Ø	WIRE	MAIN BKR	IF MLO, SERVING BKR	SERVICE RATED	kAIC RATING	Ø BUS RATING (A)	N BUS RATING	FEEDER			NOTES
												CONDUCTORS	GROUND	CONDUIT	
2E	NEMA 1	SURFACE	120/240	1	3	200	N/A	YES	10	200	100%	3#3/0	NONE	2 1/2"C	
2W	NEMA 1	SURFACE	120/240	1	3	MLO	125	NO	10	125	100%	3#1/0	#6	2"C	

NOTES
 ALL PANELBOARDS ARE TO HAVE COPPER BUS.
 ALL PANELBOARDS ARE TO HAVE ARC FLASH WARNING LABEL IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE ARTICLE 110.16

PANELBOARD SCHEDULE

MARK: PANEL 2E												
CKT #	LOAD DESCRIPTION	BREAKER		PHASE (kVA)		PHASE (kVA)		BREAKER		LOAD DESCRIPTION		CKT #
		P	TRIP	A	B	A	B	TRIP	P			
1	SPARE	1	20		0.2	20	1			GENERAL RECEPTACLES	2	
3	INTERIOR LIGHTING	1	20	0.1		20	1			SPARE	4	
5	SPARE	1	20		1.5	20	1			HAND DRYER *	6	
7	INTERIOR LIGHTING	1	20	0.2		20	1			SPARE	8	
9	PANEL 2W	2	125	10.1	0.5	20	1			DOOR MAG LOCKS	10	
11				10.0	0.2	20	1			EXTERIOR LIGHTING	12	
13	SPARE	1	20			20	1			SPARE	14	
15	EWC *	1	20	0.2	0.2	20	1			EWC *	16	
17	SPARE	1	20			20	1			SPARE	18	
19	SPARE	1	20		1.5	20	1			HAND DRYER *	20	
21	SPARE	1	20			20	1			SPARE	22	
23	SPARE	1	20			20	1			SPARE	24	

10.1 10.5 2.2 1.9

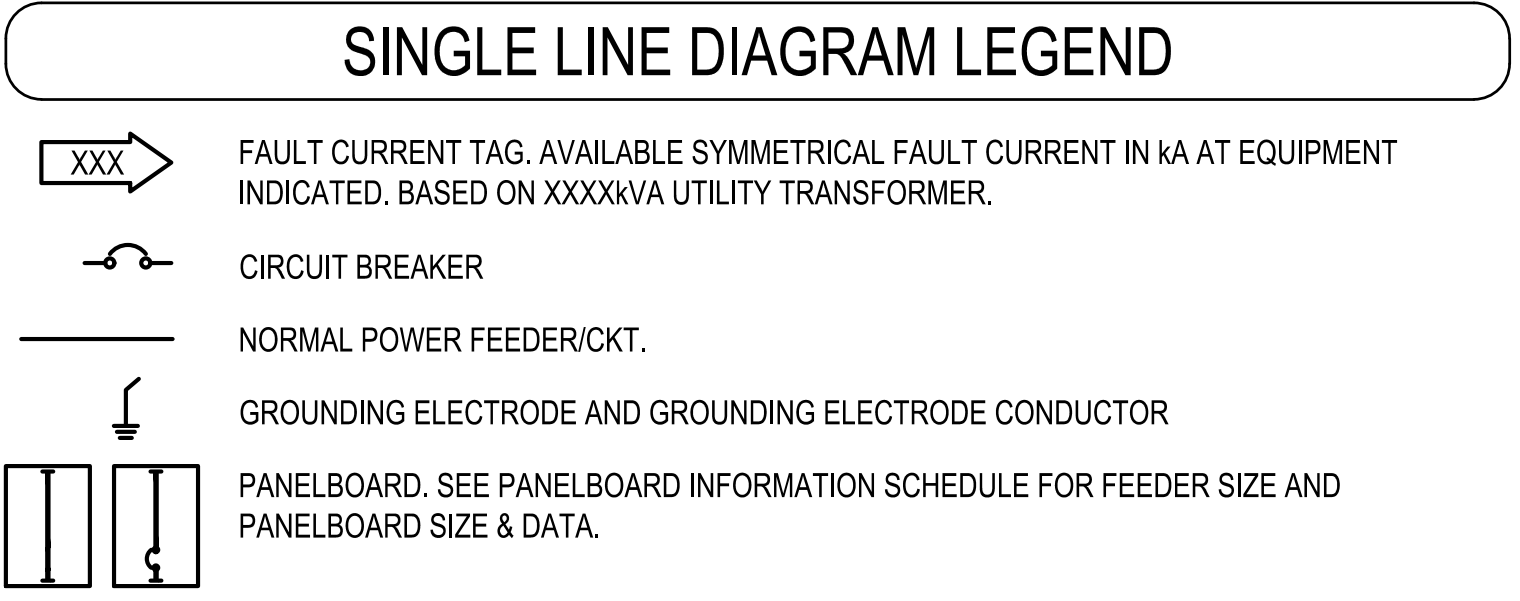
TOTAL (kVA) ØA 12.3 ØB 12.3 HIGH PHASE (AMPS) 102.8
 TOTAL CONNECTED LOAD (kVA) 24.7 TOTAL LOAD (AMPS) 102.7

CREATE A DIRECTORY TO INDICATE INSTALLED LOADS. INDICATE LOAD TYPE (REC, LTG, AHU-1, ETC.) & ROOM NUMBERS FOR EVERY BRANCH CIRCUIT.
 * PROVIDE THIS CIRCUIT WITH A GFCI BREAKER.

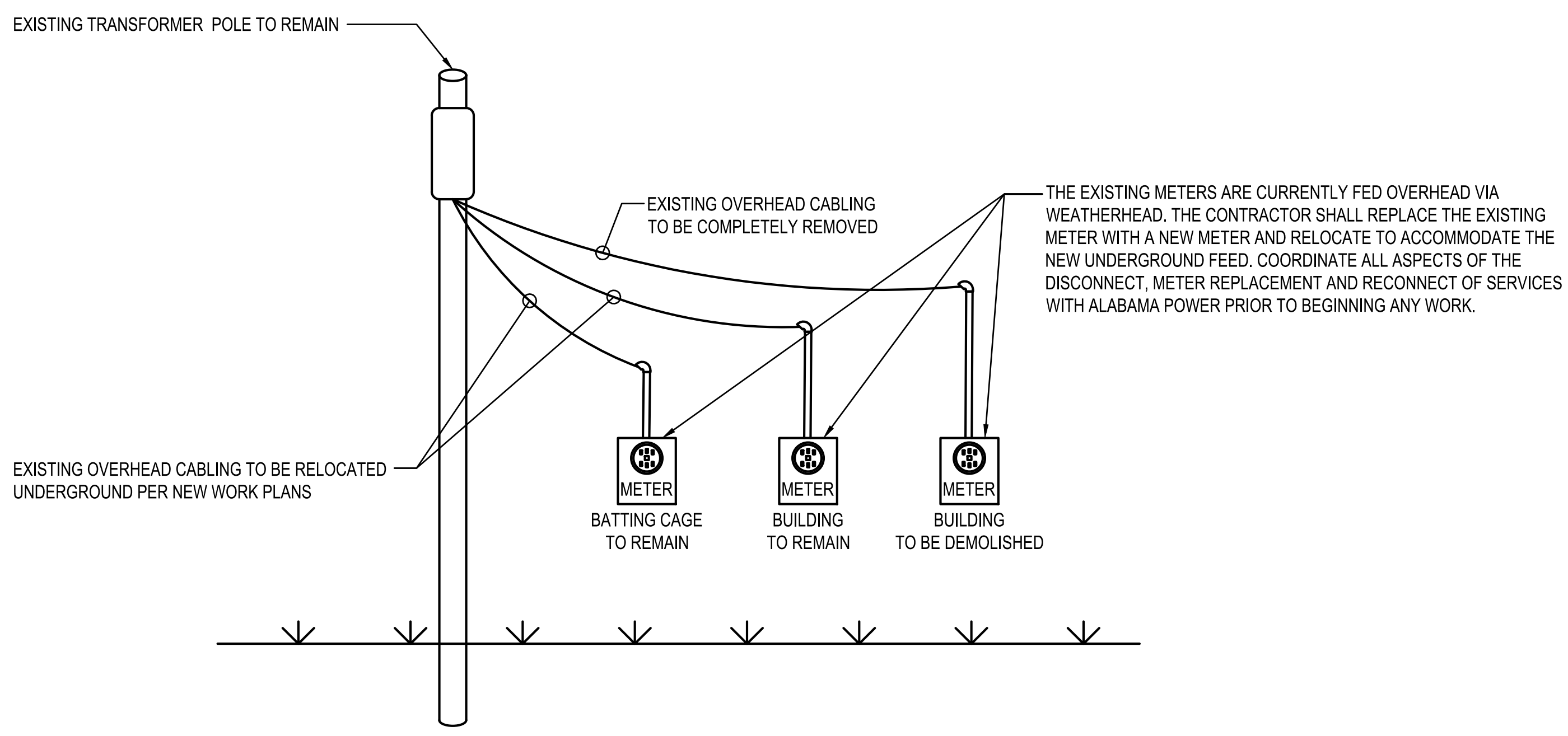
NOTE: THIS IS AN ELECTRICAL POWER DISTRIBUTION SYSTEM SINGLE LINE DIAGRAM, NOT ALL MECHANICAL EQUIPMENT CIRCUITS AND BRANCH CIRCUITS ARE SHOWN

NOTE: LOCATION OF MAIN BREAKERS AND FEEDERS INTO EQUIPMENT IS NOT INTENDED TO SHOW TOP OR BOTTOM MOUNTED MAIN BREAKER OR BOTTOM, TOP OR SIDE FEEDER ENTRY. THE SINGLE LINE DIAGRAM IS PURELY DIAGRAMMATIC. CONTRACTOR SHALL VERIFY PROPER BREAKER POSITIONS AND FEEDER ENTRIES INTO EQUIPMENT AND PROVIDE AS REQUIRED.

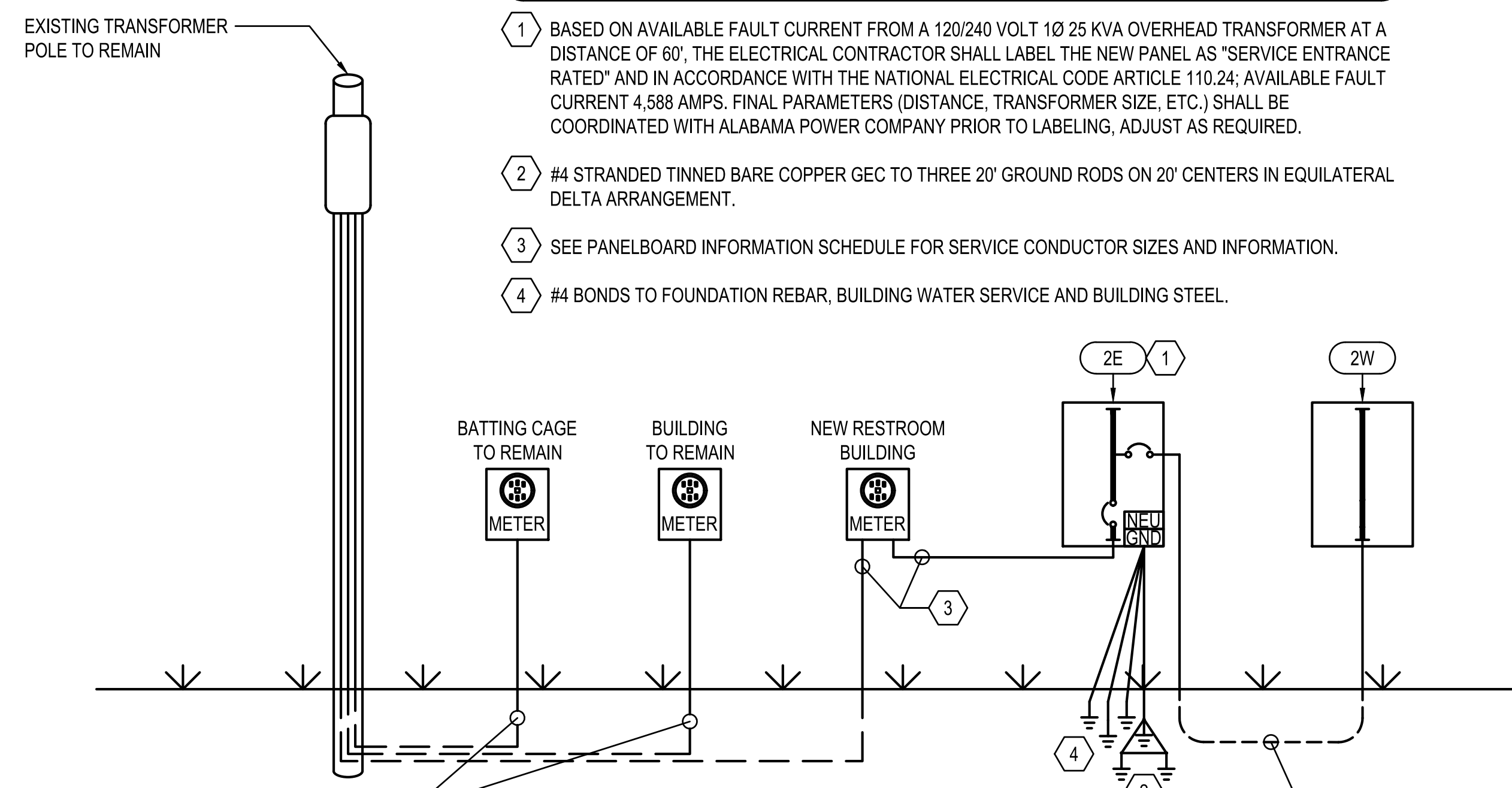
NOTE: OCPDs ON THE SECONDARY OF DRY-TYPE XFMRs SHALL BE INSTALLED WITHIN 10' PER NEC 240.21(C)(2)



- ### SHEET NOTES
- BASED ON AVAILABLE FAULT CURRENT FROM A 120/240 VOLT 1Ø 25 KVA OVERHEAD TRANSFORMER AT A DISTANCE OF 60', THE ELECTRICAL CONTRACTOR SHALL LABEL THE NEW PANEL AS "SERVICE ENTRANCE RATED" AND IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE ARTICLE 110.24; AVAILABLE FAULT CURRENT 4,588 AMPS. FINAL PARAMETERS (DISTANCE, TRANSFORMER SIZE, ETC.) SHALL BE COORDINATED WITH ALABAMA POWER COMPANY PRIOR TO LABELING, ADJUST AS REQUIRED.
 - #4 STRANDED TINNED BARE COPPER GEC TO THREE 20' GROUND RODS ON 20' CENTERS IN EQUILATERAL DELTA ARRANGEMENT.
 - SEE PANELBOARD INFORMATION SCHEDULE FOR SERVICE CONDUCTOR SIZES AND INFORMATION.
 - #4 BONDS TO FOUNDATION REBAR, BUILDING WATER SERVICE AND BUILDING STEEL.



1 EXISTING SINGLE LINE RISER DIAGRAM
 NOT TO SCALE



2 MODIFIED SINGLE LINE RISER DIAGRAM
 NOT TO SCALE

THE ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL NEW 3#3/0 IN 5" CONDUIT. COORDINATE CONDUIT SIZE (AND QUANTITY) OF CONDUIT FOR NEW FEEDERS WITH ALABAMA POWER PRIOR TO BEGINNING ANY WORK.

ABBREVIATIONS

THIS LIST IS NOT ALL INCLUSIVE

A.F.F. ABOVE FINISHED FLOOR	FL FIRE HYDRANT	RAD RADIUS	REQ REQUIRED
A.C.T. ACOUSTICAL TILE	FL FLOOR	REQ REQUIRED	R.D. ROOF DRAIN
ADJ ADJACENT	FTG FOOTING	R.O. ROUGH OPENING	R.O.W. RIGHT OF WAY
ADJT ADJUSTABLE	FDN FOUNDATION	RM ROOM	REF REFERENCE
ALT ALTERNATE	FD FLOOR DRAIN	REF REFERENCE	REV. REVISION
ALUM ALUMINUM	GA GAUGE	SCHED SCHEDULE	SECT SECTION
ANOD ANODIZED	GALV GALVANIZED	SECT SECTION	SHT SHEET
BRG BEARING	GWB GYPSUM WALLBOARD	SIM SIMILAR	SK SKYLIGHT
B.M. BENCH MARK	GYP GYPSUM	SPKR SPEAKER	SPEC SPECIFICATIONS
BLKG BLOCKING	HC HANDICAP	S.S. STAINLESS STEEL	STD STANDARD
BD BOARD	HDW HARDWARE	STA STATION	STL STEEL
BTM BOTTOM	HVAC HEATING / VENTILATION / AC	STOR STORAGE	STRUC STRUCTURAL
CIP CAST IN PLACE	HM HOLLOW METAL	SUSP CL SUSPENDED CEILING	S.F. SQUARE FEET
CLG CEILING	HORIZ HORIZONTAL	TEL TELEPHONE	THK THICK
CLOS CLOSET	HB HOSE BIBB	T&G TONGUE AND GROOVE	T/B TOP AND BOTTOM
CO CLEAN OUT	HR HOUR	T.O.C. TOP OF CONCRETE	T.O.M. TOP OF MASONRY
CLR CLEAR	INSUL INSULATION	T.O.S. TOP OF STEEL	T.O.W. TOP OF WALL
COL COLUMN	IN INCH	TYP TYPICAL	
CONC CONCRETE	INT INTERIOR	U.N.O. UNLESS OTHERWISE NOTED	
CMU CONCRETE MASONRY UNIT	MFR MANUFACTURER	UL UNDERWRITERS	
CONT CONTINUOUS	M.O. MASONRY OPENING	LABORATORIES	
CJ CONTROL JOINT	MAT MATERIAL	VB VAPOR BARRIER	
CG CORNER GUARD	MAX MAXIMUM	VCT VINYL COMPOSITION TILE	
CFCI CONTRACTOR FURNISHED	MECH MECHANICAL	VERT VERTICAL	
CONTRACTOR INSTALLED	MTL METAL	VTR VENT THROUGH ROOF	
DTL DETAIL	MIN MINIMUM	WH WALL HYDRANT	
DIAG DIAGONAL	MISC MISCELLANEOUS	WC WATER CLOSET	
DIA DIAMETER	MUL MULLION	WP WATERPROOFING	
DIM DIMENSION	NOM NOMINAL	WT WEIGHT	
D.S. DRAIN	N NORTH	WWF WELDED WIRE FABRIC	
D.F. DRINKING FOUNTAIN	NTS NOT IN CONTRACT	WIN WINDOW	
	NO NOT TO SCALE	W WITH	
	NUMBER	W/O WITHOUT	
	O.C. ON CENTER	WD WOOD	
	OPNG OPENING		
	OD OUTSIDE DIAMETER		
	OPP. HAND OPPOSITE HAND		
	O.H. OVER HEAD		
	OFCI OWNER FURNISHED		
	CONTRACTOR INSTALLED		
	OWNER FURNISHED		
	OWNER INSTALLED		
	P. LAM PLASTIC LAMINATE		
	PART. PARTITION		
	PC PRECAST CONCRETE		
	PL PLATE		
	PLYWD PLYWOOD		
	PIP POURED IN PLACE		
	PREFAB PREFABRICATED		
	PTC POST TENSIONED CONCRETE		
	P.T. PRESSURE TREATED		
	PVC POLYVINYL CHLORIDE		

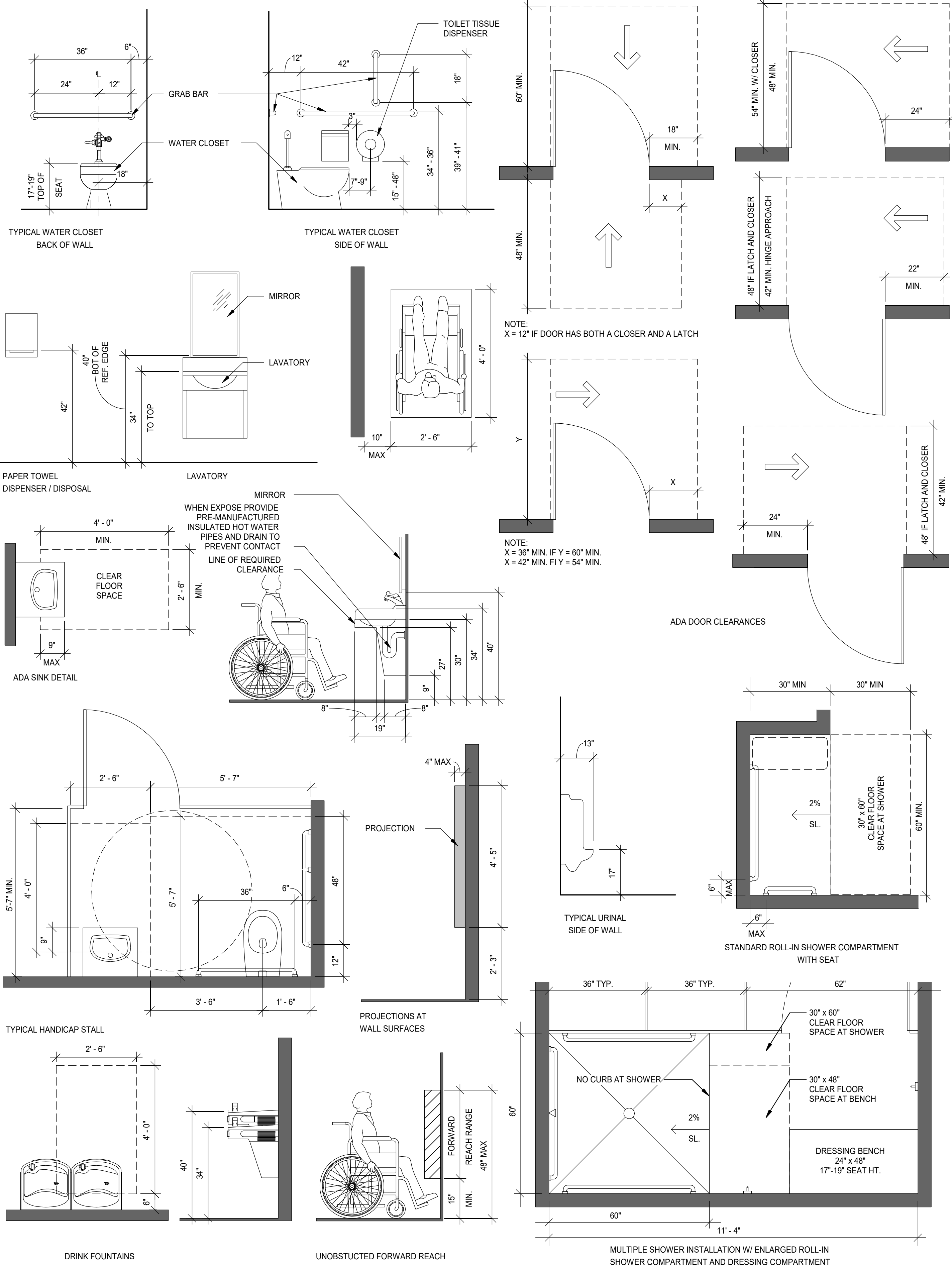
MATERIALS LEGEND

SELECT COMPACT FILL	
POROUS / STONE / ROCK FILL	
CONCRETE	
PLASTER, GROUT, STUCCO FINISH	
MASONRY VENEER, GENERAL HATCHING	
CONCRETE BLOCK	
PLYWOOD SHEATHING	
ROUGH WOOD	
FINISH WOOD	
INSULATION	
METAL	
RIGID INSULATION	

SYMBOLS LEGEND

NORTH ARROWS	
EXTERIOR ELEVATION	SHEET NO. X DETAIL NO. X
INTERIOR ELEVATION	SHEET NO. X DETAIL NO. X TYP. X
SECTION	DETAIL NO. 1 TYP. 1 SHEET NO. A101
DOOR SYMBOL	
WINDOW / LOUVER SYMBOL	
ROOM TAG	Room name 101
KEYNOTE TAG	01 01 01.1
SPOT ELEVATION	
DETAIL CALLOUT / ENLARGED PLAN	DETAIL NO. 1 TYP. 1 SHEET NO. A101
COLUMN CENTERLINE	
PARTITION TYPE	
REVISION / ADDENDA TAG	

ADA STANDARDS AND REQUIRED CLEARANCES



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CHRISTIANPREUS
 Landscape Architecture

ARCHITECTURAL DRAWINGS FOR:
CITY OF MOBILE- MIMS PARK
 Mobile, AL 36693



DATE: May 5, 2024
 ISSUED FOR PERMIT SCALE
G1.0

BUILDING CODE SUMMARY

2. LEAD DESIGN PROFESSIONAL Mott MacDonald - Andrew P Marasca

Table with 4 columns: Designer, Name, License #, Phone #. Lists Mott MacDonald - Andrew P. Marasca and other team members.

1. GENERAL INFORMATION

Name of Project Mims Park - New Recreational Facility

Project Address 5400 Grishilde Dr. Mobile, AL 36693

Proposed Use Utility (IBC)

Architects/Engineers letter of Supervision Provided? Yes No

1.1 Codes used in design (Check all that apply)

Table with 2 columns: Code, Description. Lists 2021 International Building Code, Fire Code, Energy Conservation Code, etc.

1.2 Construction Description

Addition, Renovation of Existing Building, Alteration, Tenant Build-Out, New Construction, Shell

Scope of Work - Building:

The Building is primarily constructed of ground face CMU on a Turned Down Concrete Footing system. The Roof structure is a mixture of 2x wood framing and engineered wood members.

Scope of Work - Electrical:

The new building will be provided with a new underground 120/240 volt single phase electrical service. The intent is to provide a new underground secondary feeder from the Alabama Power Company service at the property line.

Scope of Work - Mechanical / Refrigeration:

The new building will be provided with a wall mount AC unit system to condition concession space. Supply and return air will be fully ductless throughout the concession space.

Scope of Work - Plumbing:

The new building will be provided with restroom facilities, a janitor's sink, and a concession fixtures. Hot water will be provided with and electric tank water heater.

2. BUILDING DATA

Total Lot Area (sf) N/A Gross Area of Building All floors (sf) 2677

Total Building Footprint (sf) 2433 Building Height: 27' 6"

Number of Stories: 1 Is there a basement? Yes No

Existing Buildings: N/A

The building will remain in operation during construction Yes No. If yes, add provisions for rigid safety barriers and dust barriers to protect the public during construction in accordance with the applicable provisions of IBC Chapter 33.

Provide Level of Alterations per IEBC 1 2 3

Renovations (Change of Occupancy)

Is the work in this building or space changing the occupancy type or use? Yes No

Historic Buildings

Is this building a Historic Building? Yes No

Construction Type IA IB IIA IIB IIIA IIIB IVA IVB IVC IVHT VA X VB

2.1 OCCUPANCY CLASSIFICATION

Table with 2 columns: Occupancy Type, Occupant Loads. Lists Assembly 303, Business 304, Education 305, etc.

3. Fire Rated Elements

Building Element Required Rating UL No. *

Table with 3 columns: Building Element, Required Rating, UL No. *. Lists Structural frame, bearing walls, non-bearing walls, floor construction, roof construction.

Sprinkler system? Yes No Partial

If "YES", provide Commercial Sprinkler Owners Information Certification:

Sprinkler type 13 13R 13D

Standpipes? Yes No Wet Dry Class

Fire / Smoke Alarm? X Yes No

Building Element Required Rating Hourly Rating UL No. *

Table with 4 columns: Building Element, Required Rating, Hourly Rating, UL No. *. Lists Ceiling-Floors, Beams, Columns, Ceiling-Roofs, etc.

- All fire rated walls shall be identified on plans by hatching, shading, etc.; show legend. Identify code section when using any special exceptions, etc. Reproduce full UL. Or other approved agencies details or reproductions of rated assemblies/penetrations on the drawings.

Draft Stopping (IBC 718.3 & 718.4) Draft stopping in floor? Yes No Draft stopping in attic? Yes No

4. Accessibility (IBC 11)

Does the design conform to IBC Chapter 11 and ICC A117.1-2017? X Yes No. If no, explain below condition that will not allow building to be accessible:

5. Design Loads (City Ordinance 1609.3)

5.1 Ultimate Design Wind Speed (IBC 1609 or ASCE 7) Risk Cat. I-145MPH X Risk Cat. II-159MPH Risk Cat. III-169MPH Risk Cat. IV-179MPH

5.2 Live Loads (IBC 1607) Roof 20 PSF Attic PSF Floor 100 PSF Mezzanine PSF

5.3 Wind-Borne Debris Region (IBC 1609)

This building will use impact resistant glass per (IBC 1609.2)? X Yes No. This building will use engineered shutters or other approved method? Yes No

5.3 Flood Requirements (IBC 1612)

All projects located in a Special Flood Hazard Area shall comply with the City of Mobile Storm Water Management and Flood Control Ordinance. Does this project comply? X Yes No. If no, explain why:

5.4 Special Inspections and Tests (IBC 17)

I have reviewed the requirements of IBC Section 17, specifically 1705; the design incorporates the requirements and is reflected on the drawings and in the specifications. Below are the requirements to be included:

The Contractor has been notified of his responsibility under Section 1704. X Yes No

5.5 Safety Glazing for Hazardous (IBC 2406)

I have identified on drawings where tempered glass is required in hazardous locations (2406.4) X Yes No

6. Fire Department Requirements:

The design professional shall provide the following required fire protection elements for the building:

Required water supply 2500 GPM @ 20 PSI

Method Used:

The Insurance Service Office (ISO) Method Iowa State University (ISU) Method, Illinois Institute of Technology (IIT) Method X International Fire Code 2021 (IFC)

Key Boxes IFC 506: X Yes No

Locks: Yes No

*required for buildings with fire protection systems, gates, non-standard fire service access i.e., elevators

Emergency Responder Communication Coverage IFC 510: Yes No

**Signal strength survey required for structures over 50,000 SF, over three stories high, or those having a basement. This requirement may be requested for structures not meeting these parameters.

Provide a Life Safety Plan (LSP) for all commercial projects: X Yes No

*At a minimum, the Life Safety Plan shall illustrate the use for all areas, occupant loads for all areas, exit locations, exit access, exit capacity, maximum travel distance, exit lights, emergency lights, fire extinguishers, fire rated assemblies, assembly area seating layout and exit discharge.

Compliance Statement required for Fire Approval: X Yes No

**Where fire apparatus access roads or a water supply for fire protection are required to be installed, such protection shall be installed and made serviceable prior to and during the time of construction.

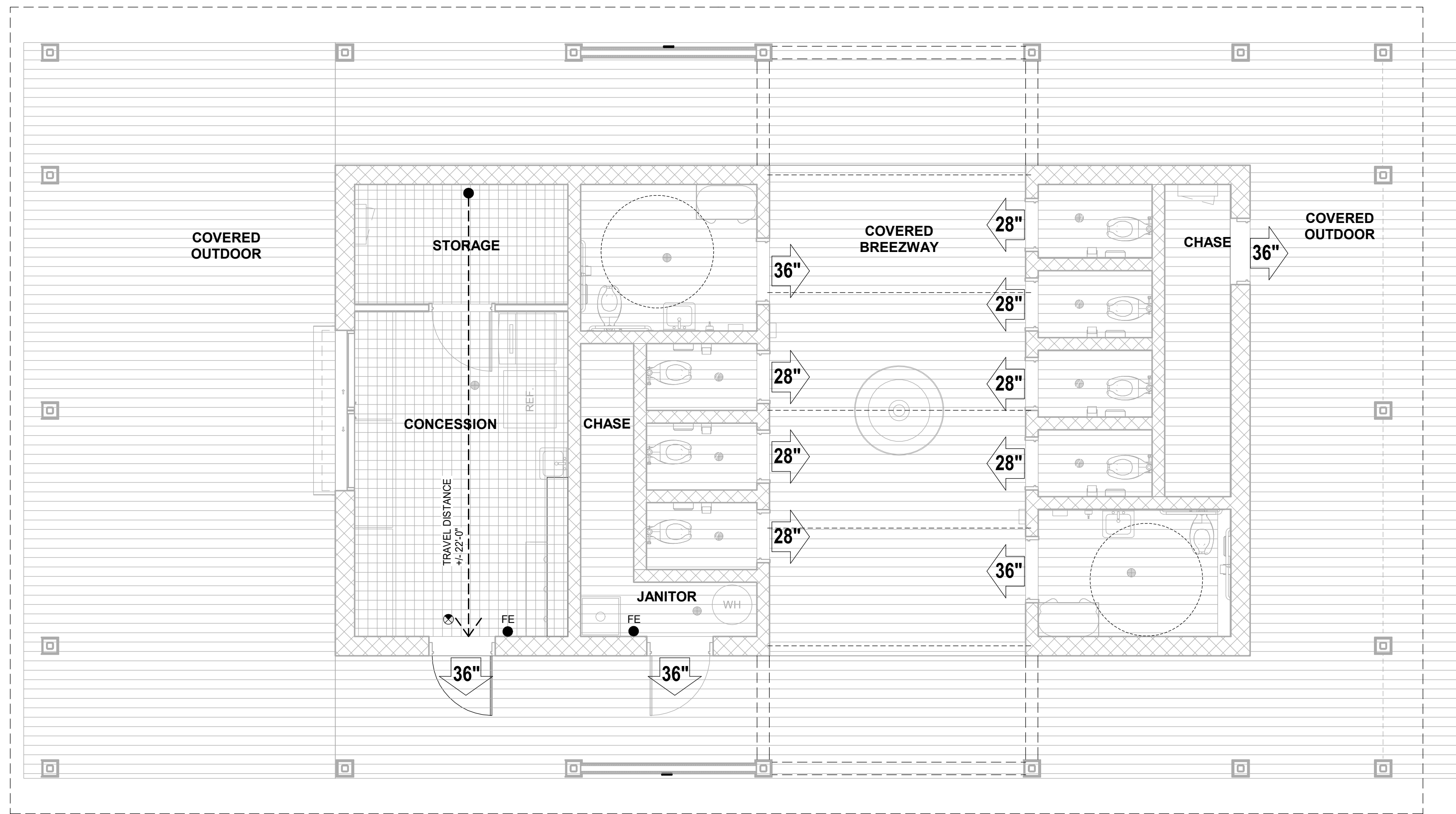
SPECIAL INSPECTIONS SCHEDULE

Table with 6 columns: CODE SECTION, SPECIAL INSPECTOR, INSPECTION, REQUIRED YES NO, FREQUENCY OF INSPECTION CONTINUOUS PERIODIC. Lists inspections for steel, concrete, masonry, wood, soils, foundations, wind, seismic, fire-resistant materials, exterior insulation, fire resistant penetrations, smoke control.

MOTT MACDONALD logo and contact information: 107 St. Francis Street, Suite 2500, Mobile, Alabama 36602. Telephone: (251) 343-4326, Fax: (251) 343-6902.

CHRISTIANPREUS Landscape Architecture logo and contact information: www.cplandscapeplanning.com. ARCHITECTURAL DRAWINGS FOR: CITY OF MOBILE- MIMS PARK. Mobile, AL 36693. SCALE: 1/2" = 1'-0". DATE: May 5, 2024. G2.0 ISSUED FOR PERMIT

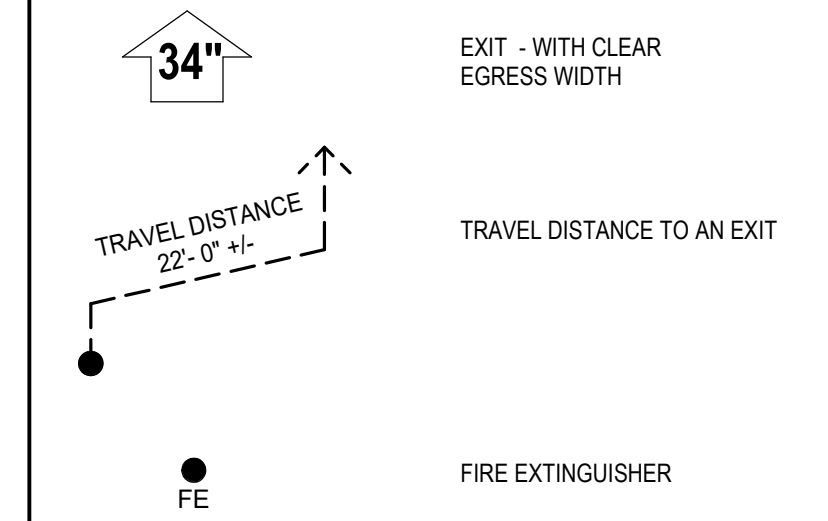




OCCUPANCY AREA					
Room #	Occupancy	ROOM NAME	AREA	Load Factor	Occupant Load
2	BUSINESS	STORAGE	65 SF	150 SF	0.4
3	BUSINESS	CONCESSION	175 SF	150 SF	1.2
B BUSINESS			240 SF		1.6
1	UTILITY - U	COVERED OUTDOOR	572 SF	300 SF	1.9
4	UTILITY - U	CHASE	32 SF	300 SF	0.1
5	UTILITY - U	TOILET ADA	64 SF	300 SF	0.2
6	UTILITY - U	TOILET	19 SF	300 SF	0.1
7	UTILITY - U	TOILET	19 SF	300 SF	0.1
8	UTILITY - U	TOILET	19 SF	300 SF	0.1
9	UTILITY - U	JANITOR	24 SF	300 SF	0.1
10	UTILITY - U	TOILET	21 SF	300 SF	0.1
11	UTILITY - U	TOILET	19 SF	300 SF	0.1
12	UTILITY - U	TOILET	19 SF	300 SF	0.1
13	UTILITY - U	TOILET	19 SF	300 SF	0.1
14	UTILITY - U	TOILET ADA	60 SF	300 SF	0.2
15	UTILITY - U	CHASE	52 SF	300 SF	0.2
16	UTILITY - U	COVERED BREEZWAY	318 SF	300 SF	1.1
17	UTILITY - U	COVERED OUTDOOR	937 SF	300 SF	3.1
U UTILITY			2193 SF		7.3
Grand total			2433 SF		8.9

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LIFE SAFETY LEGEND:

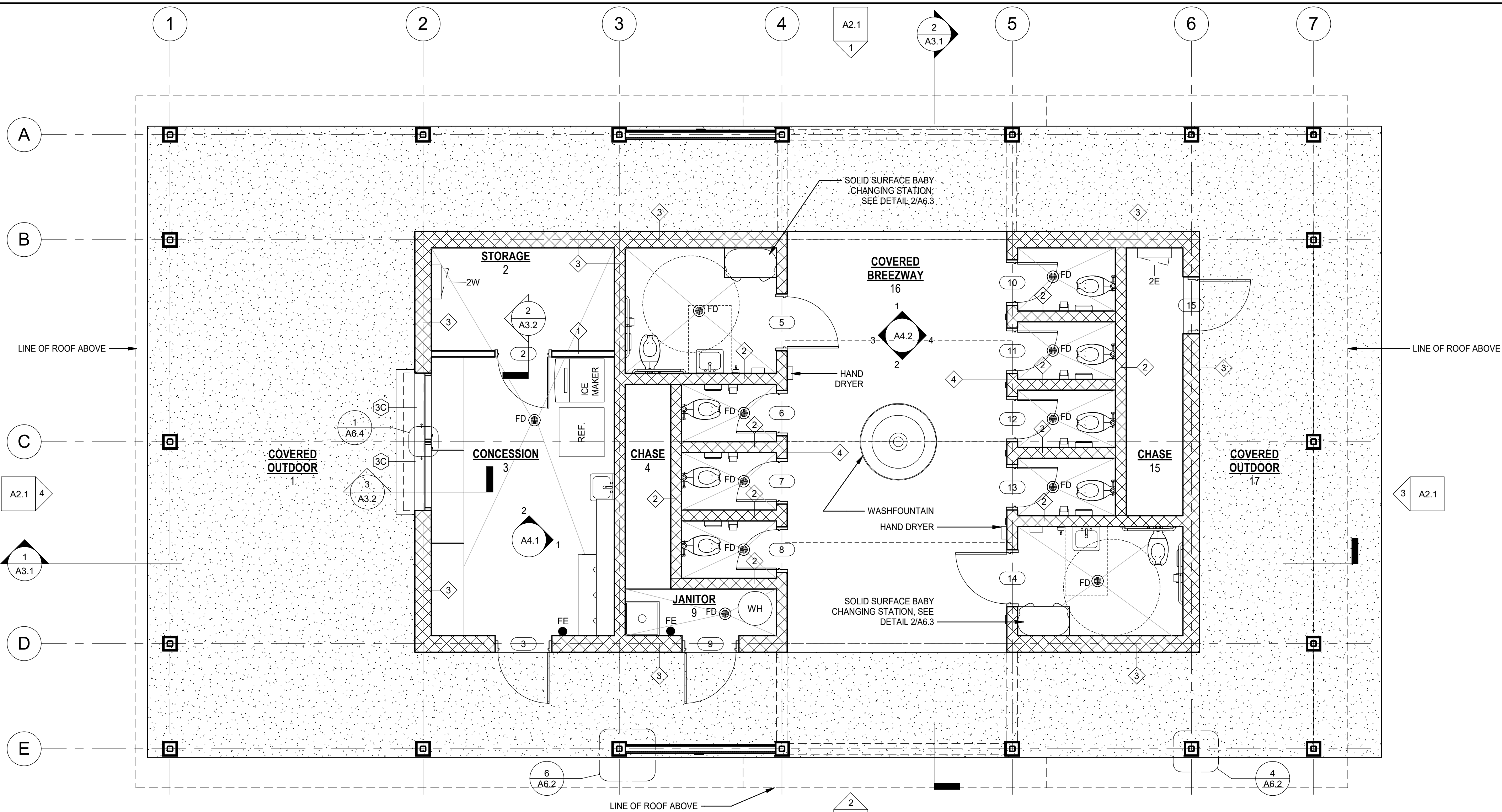


RATED PARTITIONS



OCCUPANCY





M M
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Architects
Engineers
Surveyors

- GENERAL NOTES:**
- CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND INFORM THE A/E IF THERE ARE ANY DISCREPANCIES BEFORE PROCEEDING TO DO WORK OR PURCHASE ORDERS.
 - CONTRACTOR SHALL COORDINATE WITH ALL TRADES PRIOR TO COMMENCING WORK.
 - SEE LIFE SAFETY PLAN FOR LOCATIONS AND TYPES OF RATED WALL ASSEMBLIES, FIRE EXTINGUISHERS, AND MEANS OF EGRESS.
 - REFER TO SHEET A3.3 FOR WALL TYPES INFORMATION.
 - COORDINATE WITH MECHANICAL, PLUMBING, AND ELECTRICAL PRIOR TO COMMENCING ANY WORK.
 - ALL INTERIOR DOORS SHALL BE 4" OFFSET FROM WALL UNLESS OTHERWISE NOTED.
 - ALLOW A MINIMUM OF 18 INCHES LATCH-SIDE CLEARANCE ON THE PULL SIDE OF ALL DOORS WITH MANUAL CLOSERS AND A MINIMUM OF 12 INCHES LATCH-SIDE CLEARANCE ON THE PUSH SIDE OFF ALL DOORS WITH MANUAL CLOSERS
 - GENERAL CONTRACTOR SHALL COORDINATE THE LOCATION OF REQUIRED BLOCKING IN WALLS TO RECEIVE CABINETS, SHELVING, TOILET ACCESSORIES, ETC.
 - ALLOW A MINIMUM OF 1 INCH CLEARANCE FROM THE EDGE OF ALL WALLS AND OUTSIDE FACE OF CASEWORK, TYPICAL.
 - W# #** INDICATES WINDOW REQUIREMENT. SEE WINDOW SCHEDULES FOR SIZES, GLAZING, ETC. REQUIRED.
 - 101** INDICATES DOOR NUMBER. SEE DOOR SCHEDULE FOR SPECIFIC INFORMATION ON EACH DOOR.
 - SEE FINISH DRAWINGS FOR SPECIFIC FINISH AND SURFACE PREPARATION REQUIREMENTS FOR EACH SPACE.
 - SEE REFLECTED CEILING PLANS FOR SPECIFIC CEILING TYPES, HEIGHTS, DETAILS, LIGHTS, DIFFUSERS, ETC.
 - PROVIDE BLOCKING FOR LOCKERS, TV MONITORS, CABINETS AND OTHER EQUIPMENT AS REQUIRED.
 - DETAILS LABELED "TYPICAL DETAILS" ON THE DRAWINGS APPLY TO ALL SITUATIONS THAT ARE THE SAME OR SIMILAR TO THOSE SPECIFICALLY DETAILED. SUCH DETAILS APPLY WHETHER OR NOT THEY ARE KEYED IN AT EACH LOCATION.
 - PROVIDE MOISTURE-RESISTANT PLYWOOD SHEATHING AT ALL TOILET ROOM LOCATIONS WHERE PLYWOOD SHEATHING IS REQUIRED, UNLESS OTHERWISE NOTED.
 - METHOD FOR DIMENSIONING WALLS AND OPENINGS:
- MASONRY WALLS: FACE TO FACE
- EXTERIOR FRAME WALLS: FACE OF STUDS
- INTERIOR FRAME WALLS: FACE OF STUDS
UNLESS OTHERWISE NOTED.

- GENERAL NOTES:**
- ALWAYS REFER TO DRAWINGS FOR EXACT LOCATIONS.
 - REFER TO MANUFACTURER'S SPECIFICATIONS FOR INSTALLATION DIRECTIONS & METHODS.
 - UNLESS NOTED, DO NOT USE TRANSITION STRIPS, INSTALL FLOORING MATERIALS FLUSH & BUTTED NEATLY NEXT TO ONE ANOTHER.
 - PAINT FINISH TO BE FREE OF STREAKS, RUNS & VARIATIONS.
 - CONTRACTOR SHALL SUBMIT SAMPLES / SWITCHES FOR APPROVAL OF ALL MATERIALS OUTLINED ON FINISH LEGEND FOR VERIFICATION.
 - SEE FINISH FLOOR PLAN FOR FLOOR PATTERNS AND DIRECTION OF INSTALLATION.
 - CONTRACTOR TO TAKE MEASURES TO PROTECT ALL NEW AND REMAINING FINISHES THROUGHOUT THE DURATION OF CONSTRUCTION. ANY FINISHES DAMAGED DURING CONSTRUCTION SHALL BE REPLACED / REPAIRED BY CONTRACTOR.
 - REFER TO REFLECTED CEILING PLAN FOR CEILING MATERIAL LOCATIONS AND HEIGHTS.
 - INDIVIDUAL ROOM SIGNAGE / PLATES TO BE DETERMINED AND COORDINATED WITH OWNER'S REPRESENTATIVE.

LEGEND:

- STUD WALL - UN-INSULATED
- STUD WALL - INSULATED
- MASONRY WALL
- CONCRETE SLAB
- WINDOW - SEE SCHEDULE
- DOOR - SEE SCHEDULE
- FLOOR DRAIN
- INDICATES PARTITION TYPE: SEE PARTITION TYPES SHEET A4.2

ARCHITECTURAL FLOOR PLAN
SCALE: 1/4" = 1'-0"
TRUE NORTH PROJECT NORTH

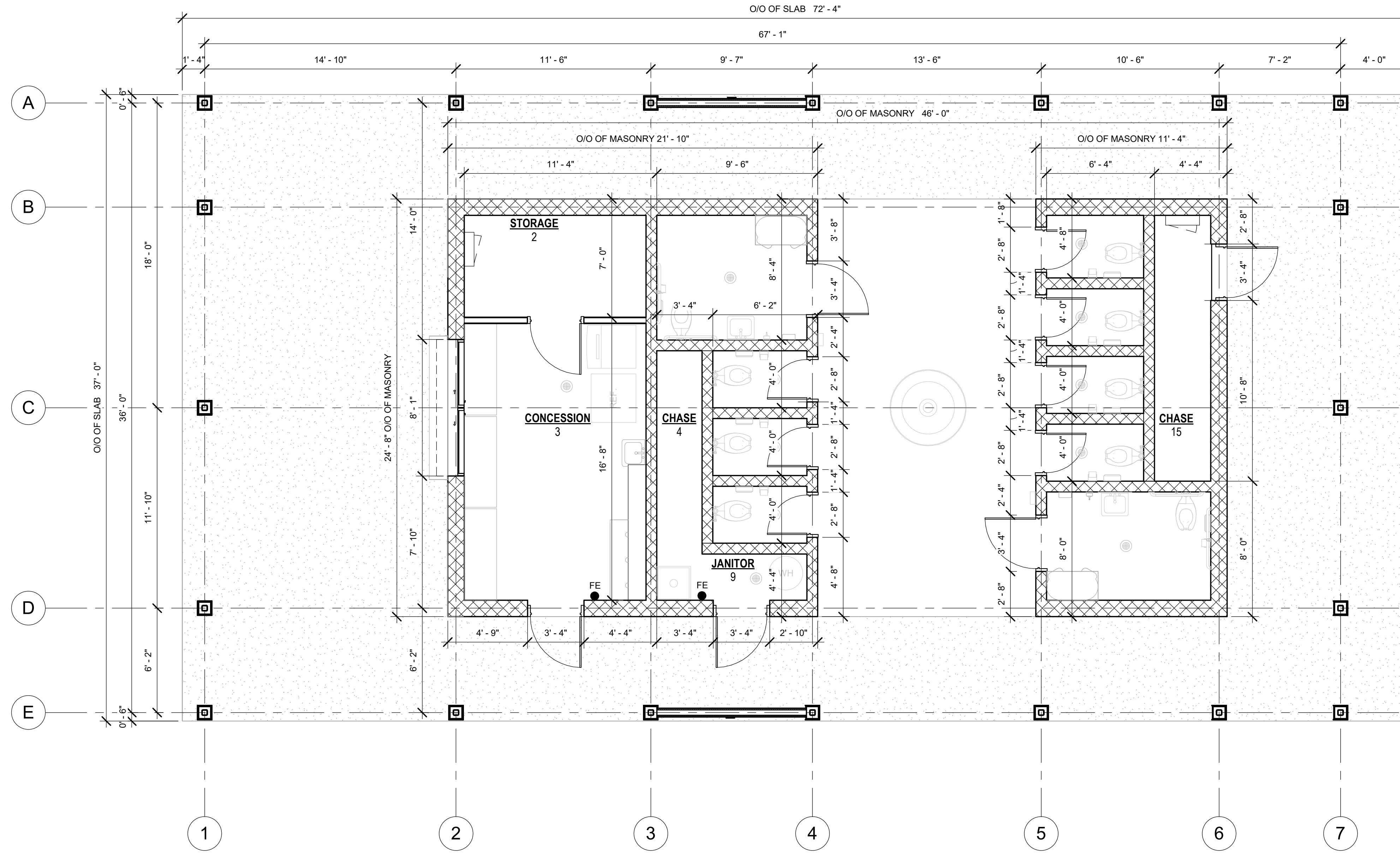
FINISH LEGEND

FLOORING: RESINOUS FLOORING: ADD ALTERNATE RES-01 MFR: STONEHARD, INC WEARING SURFACE: STONECLAD TEXTURE 2 OVERALL SYSTEM THICKNESS: 3/16" FINISH: GLOSS INSTALL: INTEGRAL 4" COVE COLOR: TBD SEALED CONCRETE EXTERIOR FLOORING: WATER REPELLANT MFR: SHERWIN WILLIAMS SC 1 - SILOXANE	PAINT: EXTERIOR TRIM: SW 9163 TIN LIZZIE EXTERIOR SIDING: SW 7757 HIGH REFLECTIVE WHITE PT-1 SW 7757 HIGH REFLECTIVE WHITE PT-2 CMU STAIN OR ALTERNATE 3 FINISH	WALLS: FIBER REINFORCED PLASTIC (FRP) PANELS: ADD ALTERNATE BASE: JOHNSONITE RB- 1 TBD FRP- 01 CRANE COMPOSITES DESIGNS COLLECTION: COLOR: FRANKLIN (98CW) CMU: CMU STAIN: LOXON® VERTICAL MFR: SHERWIN-WILLIAMS FINISH: SEMI-TRANSPARENT TYPE: LX31T0075 TINT BASE COLOR: SILVER GRAY	CMU: NETTLETON CONCRETE BURNISHED FACE BLOCK COLOR RAVEN ADD ALTERNATE ROOF PANEL AND TRIM STYLE: AS SPECIFIED COLOR: TRUE BLACK	FINISHES NOTE: ALL FINISH COLORS TO BE CONFIRMED ONCE ALTERNATES HAVE BEEN FINALIZED. COLORS TO BE SELECTED BY THE ARCHITECT ONCE ALL FINISH SAMPLES HAVE BEEN SUBMITTED.
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ROOM FINISH SCHEDULE MAIN																
ROOM NO.	ROOM NAME	FLOOR		BASE	WALLS								CEILING			REMARKS / COMMENTS
		FINISH	MAT'L		NORTH		EAST		SOUTH		WEST		MAT'L	FINISH	HEIGHT	
					MAT'L	FINISH	MAT'L	FINISH	MAT'L	FINISH	MAT'L	FINISH				
1	COVERED OUTDOOR	SEALED CONCRETE	CONCRETE	---												
2	STORAGE	SEALED CONCRETE	CONCRETE	---	CMU	PT-1	CMU	PT-1	GYP BD	PT-1	CMU	PT-1	GYP BD	PT-1	9'-0"	
3	CONCESSION	SEALED CONCRETE	CONCRETE	RES-01	CMU	PT-1	CMU	PT-1	CMU	PT-1	CMU	PT-1	GYP BD	PT-1	9'-0"	ALTERNATE, ADD RESINOUS FLOORING
4	CHASE	SEALED CONCRETE	CONCRETE	---									OPEN	---	9'-0"	
5	TOILET ADA	SEALED CONCRETE	CONCRETE	RES-01	CMU	FRP / PT- 2	CMU	PT- 2	CMU	PT- 2	CMU	PT- 2	GYP BD	PT- 1	9'-0"	
6	TOILET	SEALED CONCRETE	CONCRETE	RES-01	CMU	FRP / PT- 2	CMU	PT- 2	CMU	PT- 2	CMU	PT- 2	GYP BD	PT- 1	9'-0"	ALTERNATE, ADD RESINOUS FLOORING. ALTERNATE, ADD FRP PANELS UP TO 48"
7	TOILET	SEALED CONCRETE	CONCRETE	RES-01	FRP UP TO 48" / CMU ABOVE	FRP / PT- 2	CMU	PT- 2	CMU	PT- 2	CMU	PT- 2	GYP BD	PT- 1	9'-0"	ALTERNATE, ADD RESINOUS FLOORING. ALTERNATE, ADD FRP PANELS UP TO 48"
8	TOILET	SEALED CONCRETE	CONCRETE	RES-01	FRP UP TO 48" / CMU ABOVE	FRP / PT- 2	CMU	PT- 2	CMU	PT- 2	CMU	PT- 2	GYP BD	PT- 1	9'-0"	ALTERNATE, ADD RESINOUS FLOORING. ALTERNATE, ADD FRP PANELS UP TO 48"
9	JANITOR	SEALED CONCRETE	CONCRETE	---	CMU	PT- 2	CMU	PT- 2	CMU	PT- 2	CMU	PT- 2	---	---	OPEN	
10	TOILET	SEALED CONCRETE	CONCRETE	RES-01	FRP UP TO 48" / CMU ABOVE	FRP / PT- 2	CMU	PT- 2	CMU	PT- 2	CMU	PT- 2	GYP BD	PT- 1	9'-0"	ALTERNATE, ADD RESINOUS FLOORING. ALTERNATE, ADD FRP PANELS UP TO 48"
11	TOILET	SEALED CONCRETE	CONCRETE	RES-01	FRP UP TO 48" / CMU ABOVE	FRP / PT- 2	CMU	PT- 2	CMU	PT- 2	CMU	PT- 2	GYP BD	PT- 1	9'-0"	ALTERNATE, ADD RESINOUS FLOORING. ALTERNATE, ADD FRP PANELS UP TO 48"
12	TOILET	SEALED CONCRETE	CONCRETE	RES-01	FRP UP TO 48" / CMU ABOVE	FRP / PT- 2	CMU	PT- 2	CMU	PT- 2	CMU	PT- 2	GYP BD	PT- 1	9'-0"	ALTERNATE, ADD RESINOUS FLOORING. ALTERNATE, ADD FRP PANELS UP TO 48"
13	TOILET	SEALED CONCRETE	CONCRETE	RES-01	FRP UP TO 48" / CMU ABOVE	FRP / PT- 2	CMU	PT- 2	CMU	PT- 2	CMU	PT- 2	GYP BD	PT- 1	9'-0"	ALTERNATE, ADD RESINOUS FLOORING. ALTERNATE, ADD FRP PANELS UP TO 48"
14	TOILET ADA	SEALED CONCRETE	CONCRETE	RES-01	FRP UP TO 48" / CMU ABOVE	FRP / PT- 2	CMU	PT- 2	CMU	PT- 2	CMU	PT- 2	GYP BD	PT- 1	9'-0"	ALTERNATE, ADD RESINOUS FLOORING. ALTERNATE, ADD FRP PANELS UP TO 48"
15	CHASE	SEALED CONCRETE	CONCRETE	---									OPEN	---	OPEN	
16	COVERED BREEZWAY	SEALED CONCRETE	CONCRETE	---	CMU	---							OPEN	---	OPEN	
17	COVERED OUTDOOR	SEALED CONCRETE	CONCRETE	---												ALTERNATE ; ADD RESINOUS FLOORING

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 Mobile, AL 36693
 SCALE: As indicated
 ISSUED FOR PERMIT
 DATE: May 5, 2024
 A1.1





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GENERAL NOTES:

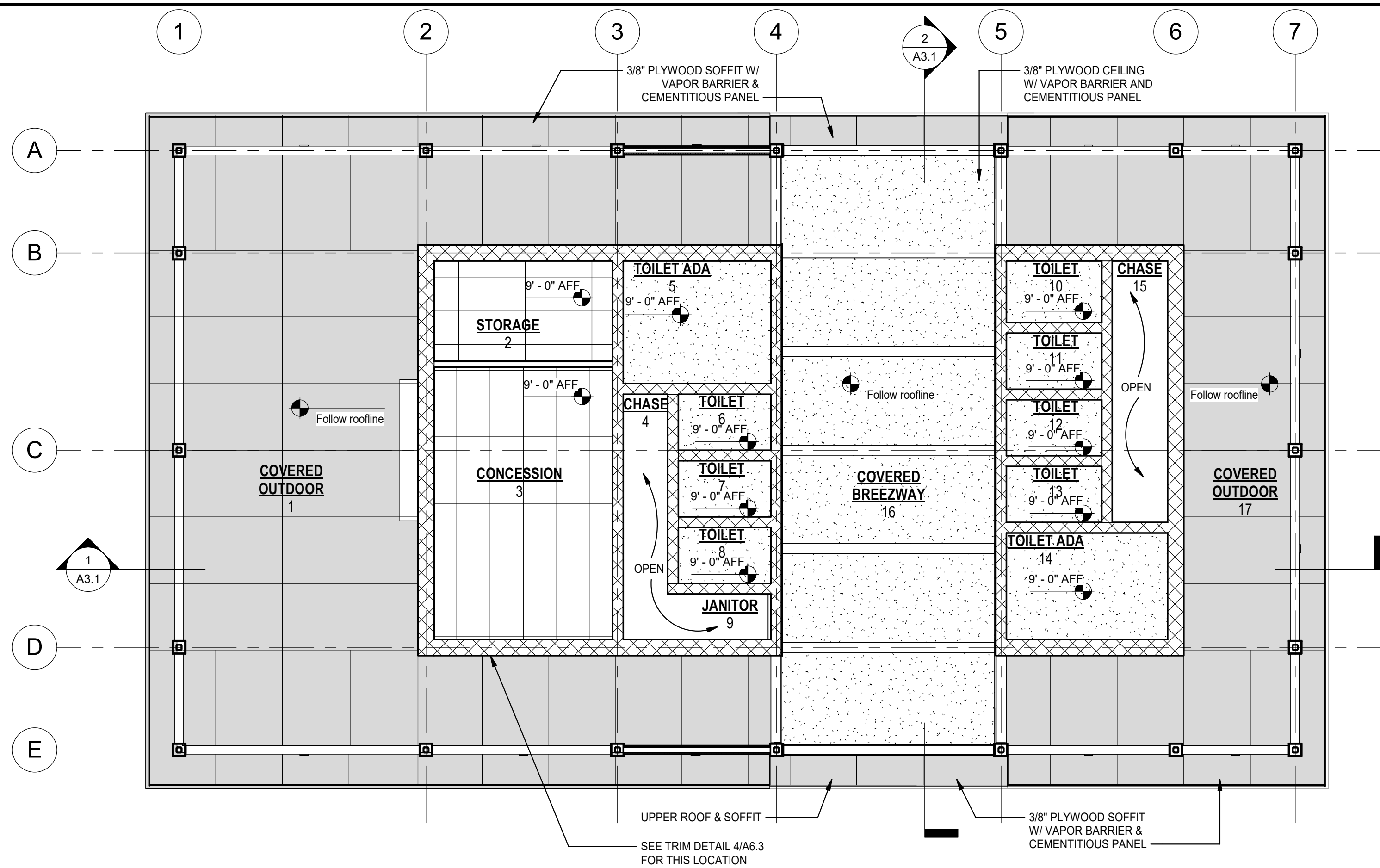
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- CONTRACTOR SHALL COORDINATE WITH ALL TRADES PRIOR TO COMMENCING WORK.
- SEE LIFE SAFETY PLAN FOR LOCATIONS AND TYPES OF RATED WALL ASSEMBLIES, FIRE EXTINGUISHERS, AND MEANS OF EGRESS.
- REFER TO SHEET A3.3 FOR WALL TYPES INFORMATION.
- COORDINATE WITH MECHANICAL, PLUMBING, AND ELECTRICAL PRIOR TO COMMENCING ANY WORK.
- ALL INTERIOR DOORS SHALL BE 4" OFFSET FROM WALL UNLESS OTHERWISE NOTED.
- ALLOW A MINIMUM OF 18 INCHES LATCH-SIDE CLEARANCE ON THE PULL SIDE OF ALL DOORS WITH MANUAL CLOSERS AND A MINIMUM OF 12 INCHES LATCH-SIDE CLEARANCE ON THE PUSH SIDE OFF ALL DOORS WITH MANUAL CLOSERS
- GENERAL CONTRACTOR SHALL COORDINATE THE LOCATION OF REQUIRED BLOCKING IN WALLS TO RECEIVE CABINETS, SHELVING, TOILET ACCESSORIES, ETC.
- ALLOW A MINIMUM OF 1 INCH CLEARANCE FROM THE EDGE OF ALL WALLS AND OUTSIDE FACE OF CASEWORK, TYPICAL.
- W# # INDICATES WINDOW REQUIREMENT. SEE WINDOW SCHEDULES FOR SIZES, GLAZING, ETC. REQUIRED.
- 101 INDICATES DOOR NUMBER. SEE DOOR SCHEDULE FOR SPECIFIC INFORMATION ON EACH DOOR.
- SEE FINISH DRAWINGS FOR SPECIFIC FINISH AND SURFACE PREPARATION REQUIREMENTS FOR EACH SPACE.
- SEE REFLECTED CEILING PLANS FOR SPECIFIC CEILING TYPES, HEIGHTS, DETAILS, LIGHTS, DIFFUSERS, ETC.
- PROVIDE BLOCKING FOR LOCKERS, TV MONITORS, CABINETS AND OTHER EQUIPMENT AS REQUIRED.
- DETAILS LABELED "TYPICAL DETAILS" ON THE DRAWINGS APPLY TO ALL SITUATIONS THAT ARE THE SAME OR SIMILAR TO THOSE SPECIFICALLY DETAILED. SUCH DETAILS APPLY WHETHER OR NOT THEY ARE KEYED IN AT EACH LOCATION.
- PROVIDE MOISTURE-RESISTANT PLYWOOD SHEATHING AT ALL TOILET ROOM LOCATIONS WHERE PLYWOOD SHEATHING IS REQUIRED, UNLESS OTHERWISE NOTED.
- METHOD FOR DIMENSIONING WALLS AND OPENINGS:
 - MASONRY WALLS: FACE TO FACE
 - EXTERIOR FRAME WALLS: FACE OF STUDS
 - INTERIOR FRAME WALLS: FACE OF STUDS
 UNLESS OTHERWISE NOTED.

LEGEND:

- STUD WALL - UN-INSULATED
- STUD WALL - INSULATED
- MASONRY WALL
- CONCRETE SLAB
- WINDOW - SEE SCHEDULE
- DOOR - SEE SCHEDULE
- FD FLOOR DRAIN
- # INDICATES PARTITION TYPE: SEE PARTITION TYPES SHEET A4.2

DIMENSIONED FLOOR PLAN
 SCALE: 1/4" = 1'-0"
 TRUE NORTH PROJECT NORTH





NOTES:
 1. SEE ELEC. DWGS. FOR LIGHT FIXTURE TYPES AND LOCATION

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GENERAL REF. CEILING PLAN NOTES:

1. THE REFLECTED CEILING PLAN IS PROVIDED TO ILLUSTRATE ARCHITECTURAL ITEMS AND TO PROVIDE A POINT OF REFERENCE FOR PLACEMENT OF MECHANICAL AND ELECTRICAL ITEMS PENETRATING THE CEILING.
2. GENERAL CONTRACTOR SHALL REFER TO MECHANICAL & ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR SCOPE OF WORK. OMISSION OF SAME ON THIS REFLECTED CEILING PLAN DOES NOT RELIEVE THE CONTRACTOR OF ANY OBLIGATION FROM PROVISIONS SHOWN ON MECHANICAL AND ELECTRICAL PORTIONS OF THE DOCUMENTS.
3. GENERAL CONTRACTOR AND HIS MECHANICAL SUBCONTRACTOR(S) SHALL RECOGNIZE AS A REQUIREMENT OF THIS PROJECT CAREFUL COORDINATION OF DUCTWORK, SPRINKLER PIPING, LIGHT FIXTURES AND FURRING AT STRUCTURE. NO FABRICATION OF DUCTWORK SHALL BEGIN UNTIL THE GENERAL CONTRACTOR HAS VERIFIED THAT ALL CEILING HEIGHTS SHOWN HEREON WILL INDEED ALLOW PROPER CLEARANCE.
4. ALL CEILING CONDUIT AND UNBRACED DUCTS, PIPES, ETC. MUST BE SEPERATED.
5. ALL LIGHT FIXTURES SHALL BE POSITIVELY ATTACHED TO THE CEILING STRUCTURE TO RESIST A HORIZONTAL FORCE EQUAL TO THE WEIGHT OF THE FIXTURES.
6. INTERIOR, CEILING MOUNTED LUMINAIRES SHALL BE MOUNTED IN A LAYOUT AS OPPOSED TO INDIVIDUAL FIXTURES. CEILING STRUCTURES CAN BE SUSPENDED UP TO 8' WITH 1/2" OR 3/4" IP CONDUIT.
7. EXTERIOR, CEILING MOUNTED LUMINAIRES CAN BE SUSPENDED WITH 1/2" OR 3/4" IP STEMS - LENGTHS SHALL BE KEPT AT A MINIMUM TO KEEP THE FIXTURES FLUSH TO THE SOFFIT AND PREVENT THE PUBLIC FROM TRYING TO HANG FROM THE CANOPIES.

GENERAL NOTES: ROOF PLAN

1. CONTRACTOR SHALL FOLLOW SMACNA STANDARDS FOR ALL ROOF TOP PENETRATIONS.
2. REFER TO PLUMBING DRAWINGS FOR PLUMBING VENTS AND PIPES THROUGH ROOF WHICH MAY NOT BE SHOWN ON THIS ROOF PLAN.
3. REFER TO MECHANICAL DRAWINGS FOR OPENINGS, DUCTS AND VENTS THROUGH ROOF WHICH MAY NOT BE SHOWN ON THIS ROOF PLAN.
4. REFER TO SPECIFICATIONS FOR MINIMUM ACCEPTABLE NRCA STANDARD FLASHING DETAILS OF HIP, VALLEY, RIDGE, EXPANSION JOINT, ROOF PENETRATION AND ROOF TO WALL TRANSITION, ETC.
5. ALL FASTENERS AND FLASHING COMPONENTS SHALL MATCH ADJACENT ROOF PANEL COLORS.
6. FIXED POINT AT STANDING SEAM METAL ROOF SYSTEM: EAVES AND VALLEY UNLESS OTHERWISE NOTED.

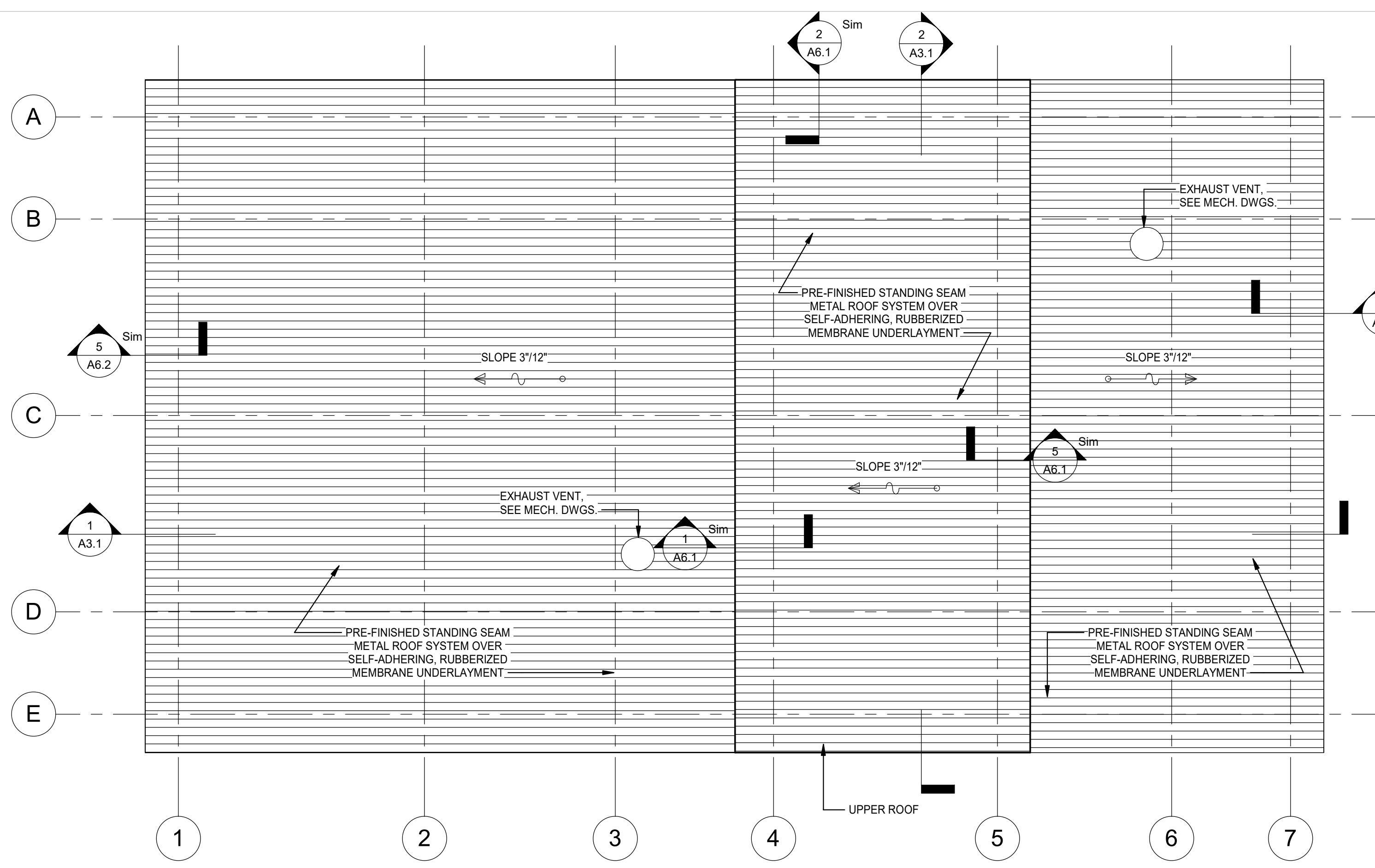
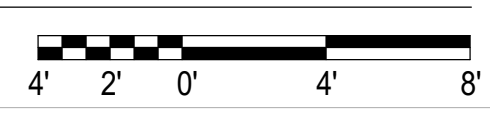
REFLECTED CEILING PLAN LEGEND

- 2x4' SUSPENDED CEILING GRID & ACOUSTICAL CEILING TILES
- 5/8" PTD. GYP. BD. ON 1X2 FURRING STRIPS AT 2'-0" O.C. ATTACHED TO BOTTOM CHORD OF ROOF STRUCTURE
- X'-X" CEILING HEIGHT SPOT ELEVATION
- PROVIDE A 4'-0" PERIMETER OF SOUND BATT INSULATION IN AREAS INDICATED. "TENT" ALL FIXTURES TO AVOID CONTACT. REFER TO SPECIFICATIONS.
- XX INDICATES LIGHT FIXTURE TYPE, REFER TO ELEC.

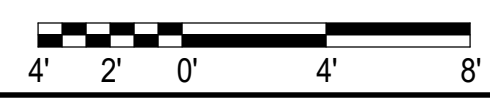
ROOF LEGEND:

- PREFINISHED STANDING SEAM METAL ROOF
- DS PREFINISHED METAL DOWNSPOUT
- GEJ GUTTER EXPANSION JOINT
- VTR VENT THROUGH ROOF; REFER TO PLUMBING
- RD ROOF DRAIN; REFER TO PLUMBING
- EJ EXPANSION JOINT; REFER TO STRUCTURAL
- RC RIDGE CAP FLASHING
- HC HIP CAP FLASHING
- VF VALLEY FLASHING
- GTR GUTTER

REFLECTED CEILING PLAN
 SCALE: 3/16" = 1'-0"
 TRUE NORTH PROJECT NORTH



ROOF PLAN
 SCALE: 3/16" = 1'-0"
 TRUE NORTH PROJECT NORTH



GENERAL NOTES: EXTERIOR ELEVATIONS

- CONTRACTOR SHALL COORDINATE WITH ALL TRADES PRIOR TO COMMENCING WORK
- FIELD VERIFY ALL BUILT CONDITIONS PRIOR TO INSTALLATION.
- COORDINATE WITH MECHANICAL, PLUMBING, ELECTRICAL, TELECOM AND SECURITY PRIOR TO COMMENCING WORK.
- ALL WINDOWS, DOORS AND EXTERIOR CLADDING SHALL MEET WIND BOURNE REQUIREMENTS AS STATED IN STRUCTURAL DRAWINGS.
- REFER TO ROOF PLAN FOR LOCATION OF GUTTERS AND DOWNSPOUTS.
- REFER TO DOOR AND WINDOW SCHEDULES FOR MORE INFORMATION.
- REFER TO STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR COATINGS ON STRUCTURAL COMPONENTS.
- REFER TO CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
- DETAILS LABELED "TYPICAL DETAILS" ON THE DRAWINGS APPLY TO ALL SITUATIONS THAT ARE THE SAME OR SIMILAR TO THOSE SPECIFICALLY DETAILED. SUCH DETAILS APPLY WHETHER OR NOT THEY ARE KEYED IN AT EACH LOCATION.

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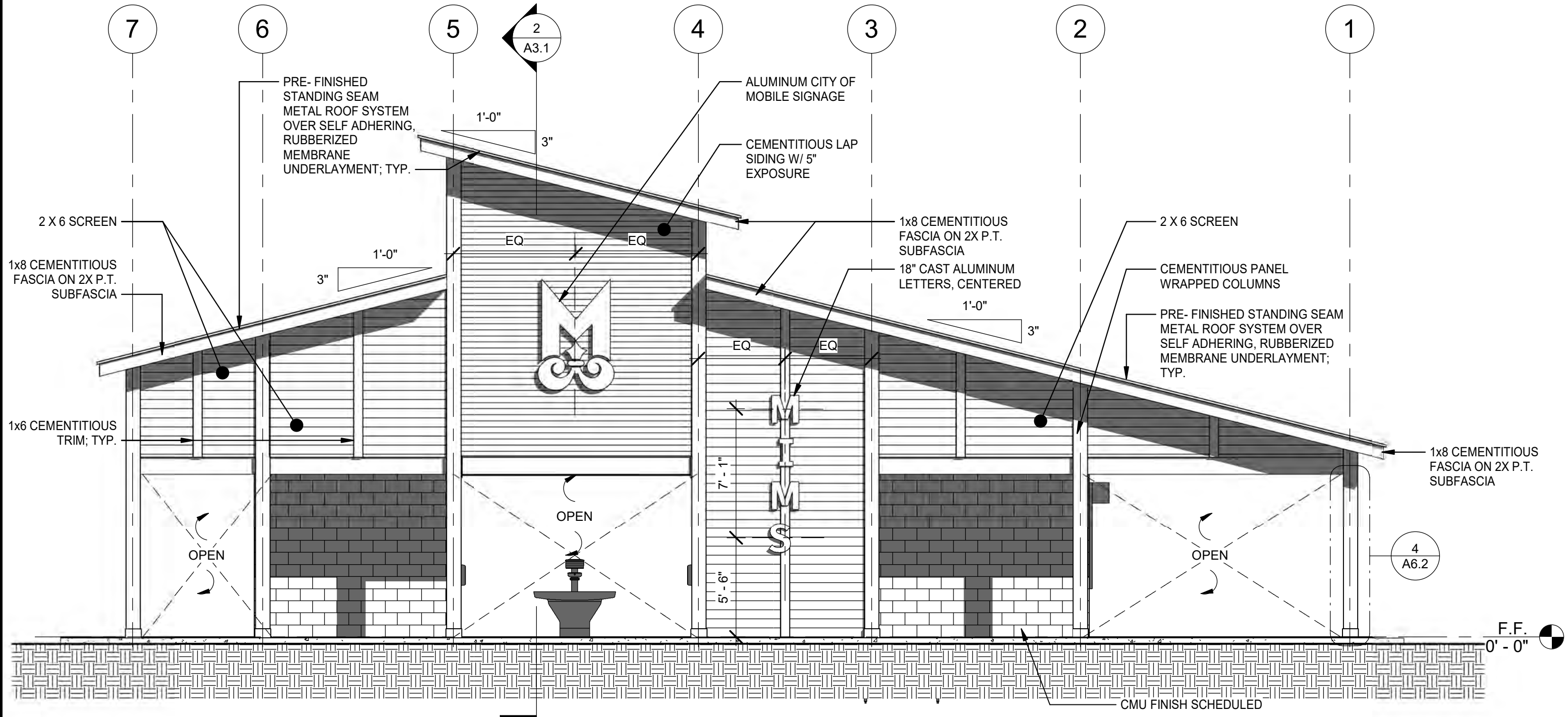
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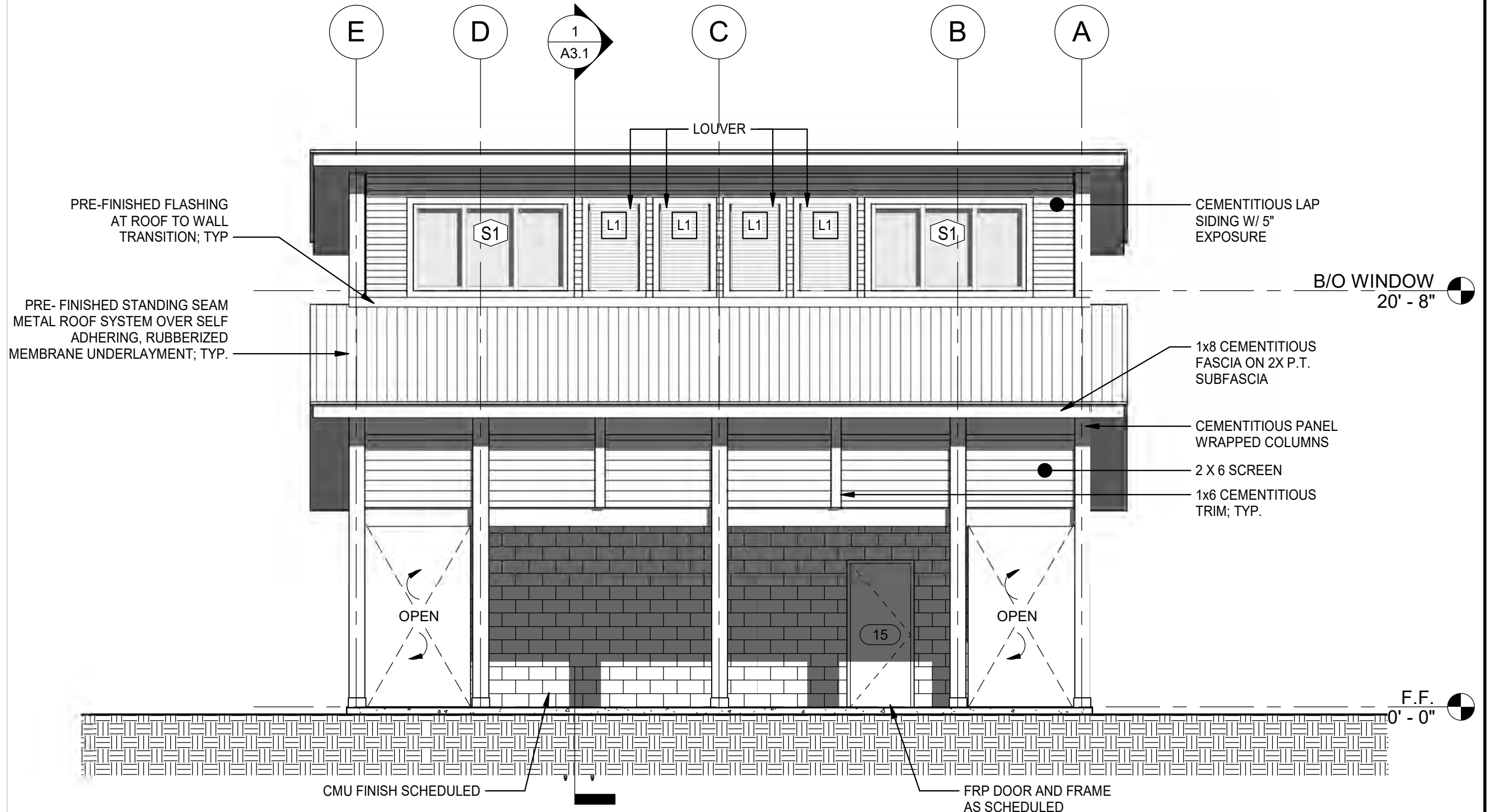
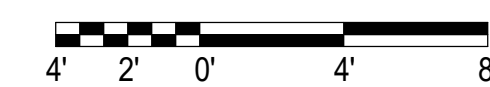
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CITY OF MOBILE- MIMS PARK
Mobile, AL 36693

ISSUED FOR PERMIT SCALE As indicated

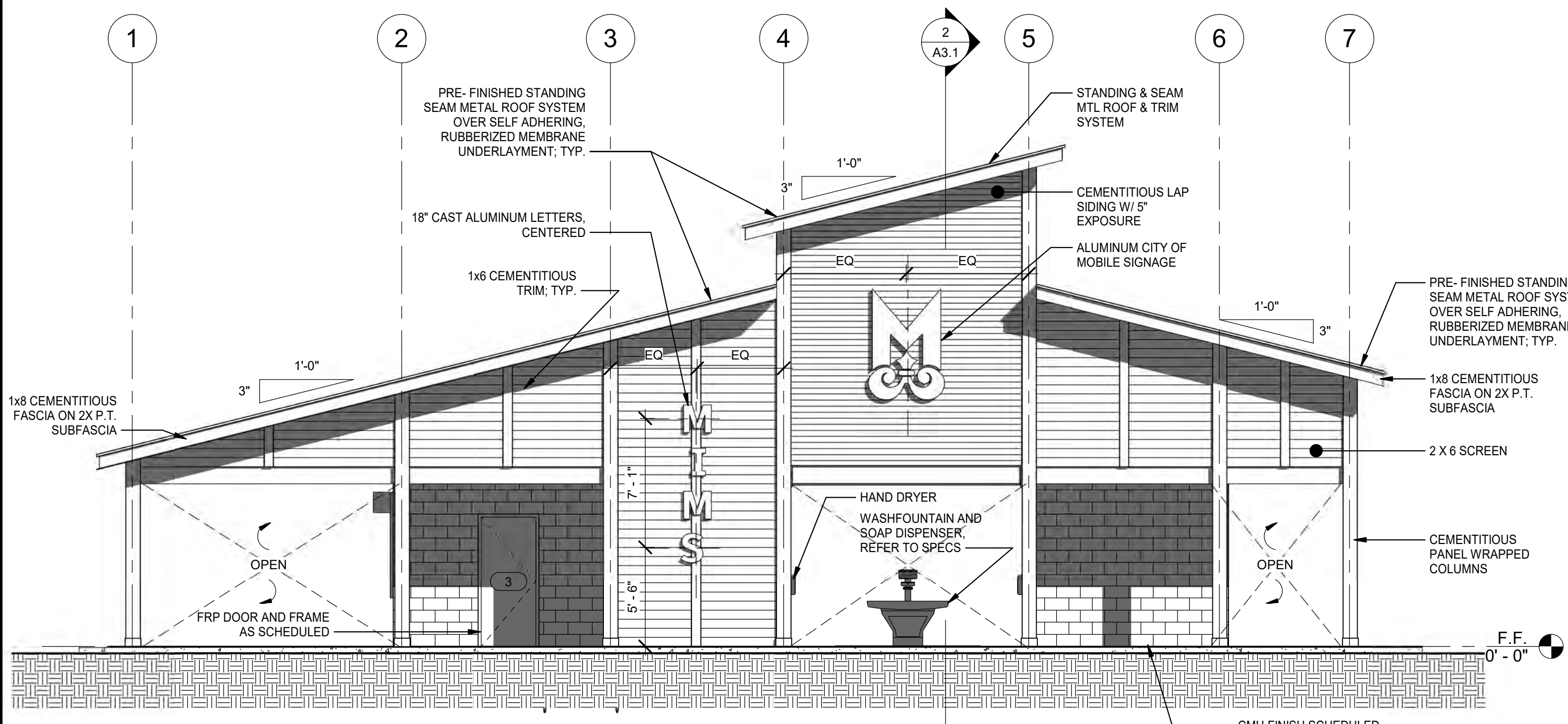
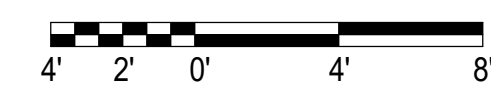
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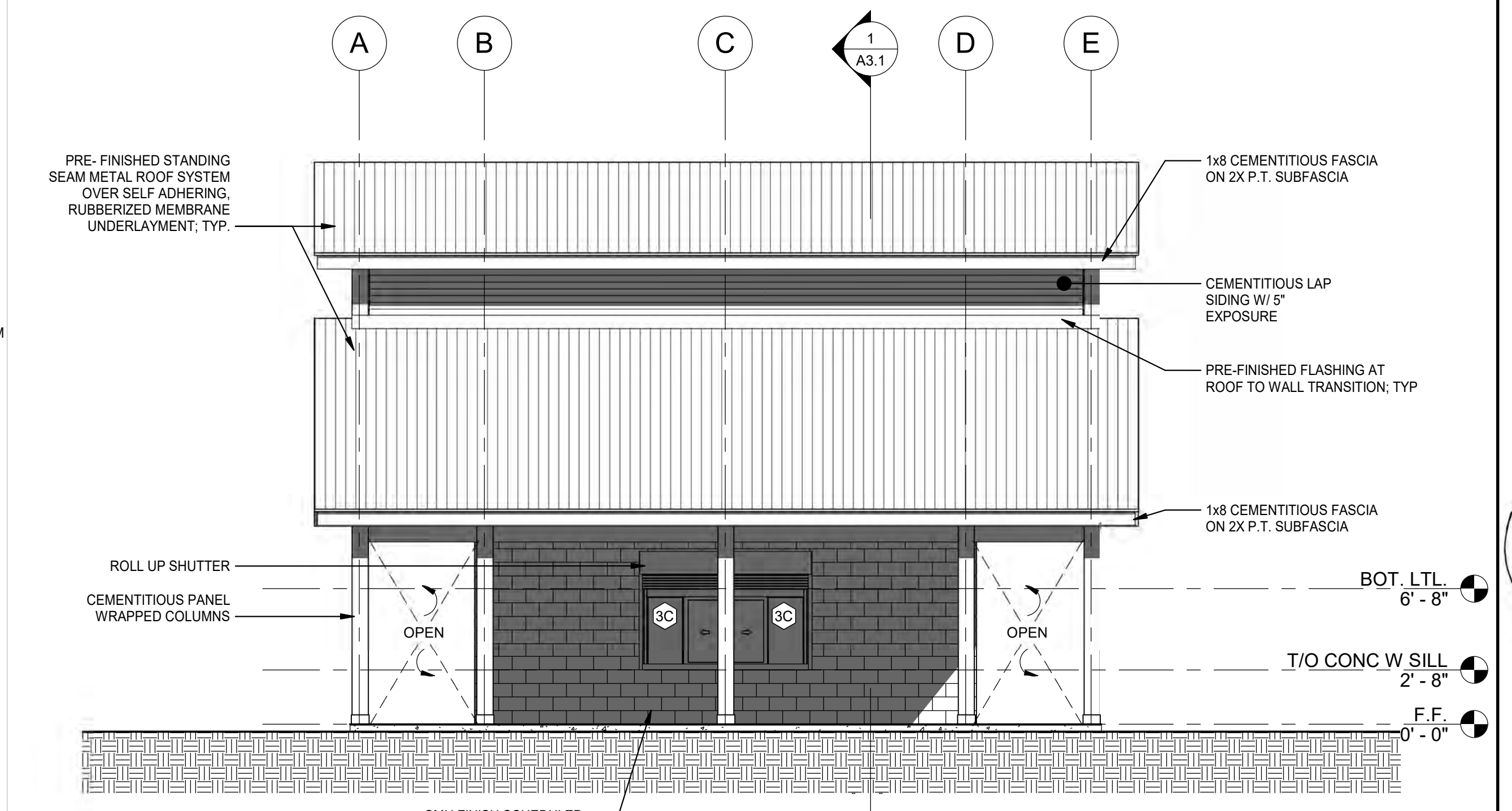
1 NORTH ELEVATION
A2.1 Scale: 3/16" = 1'-0"



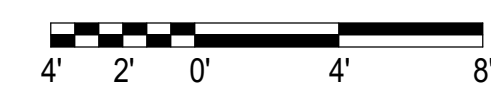
3 EAST ELEVATION
A2.1 Scale: 3/16" = 1'-0"

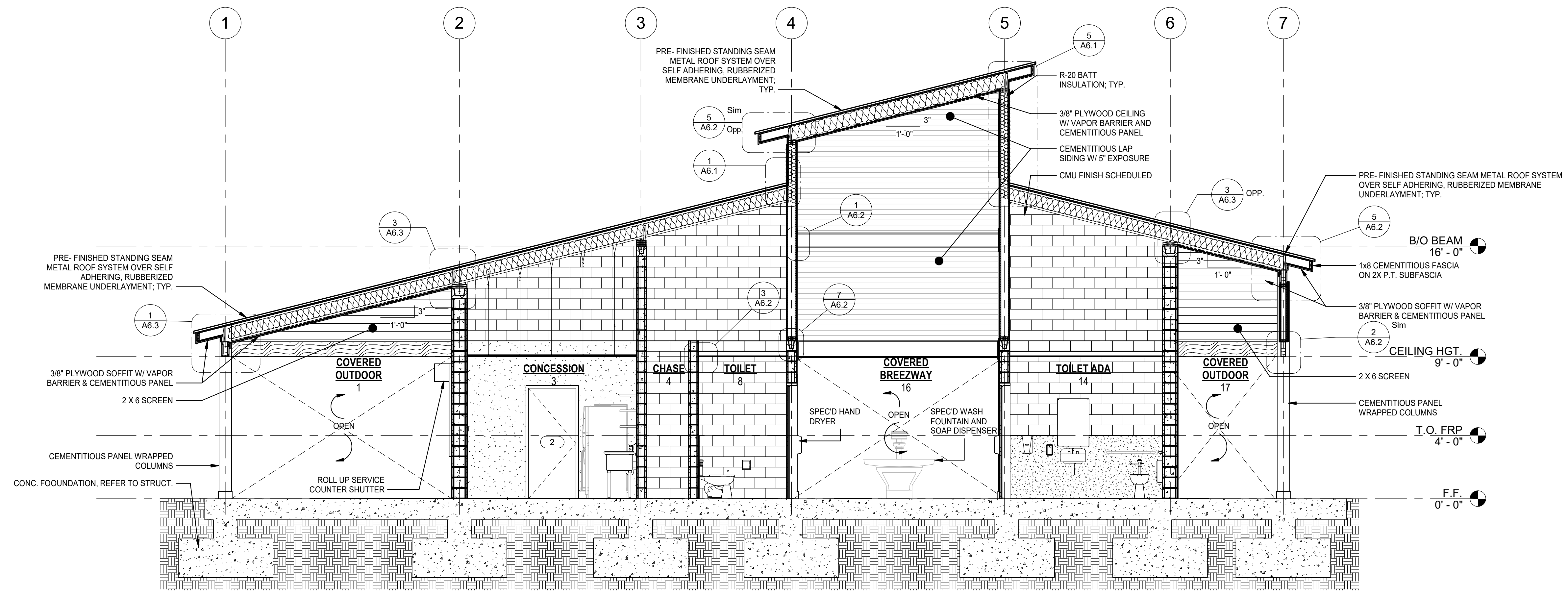


2 SOUTH ELEVATION
A2.1 Scale: 3/16" = 1'-0"

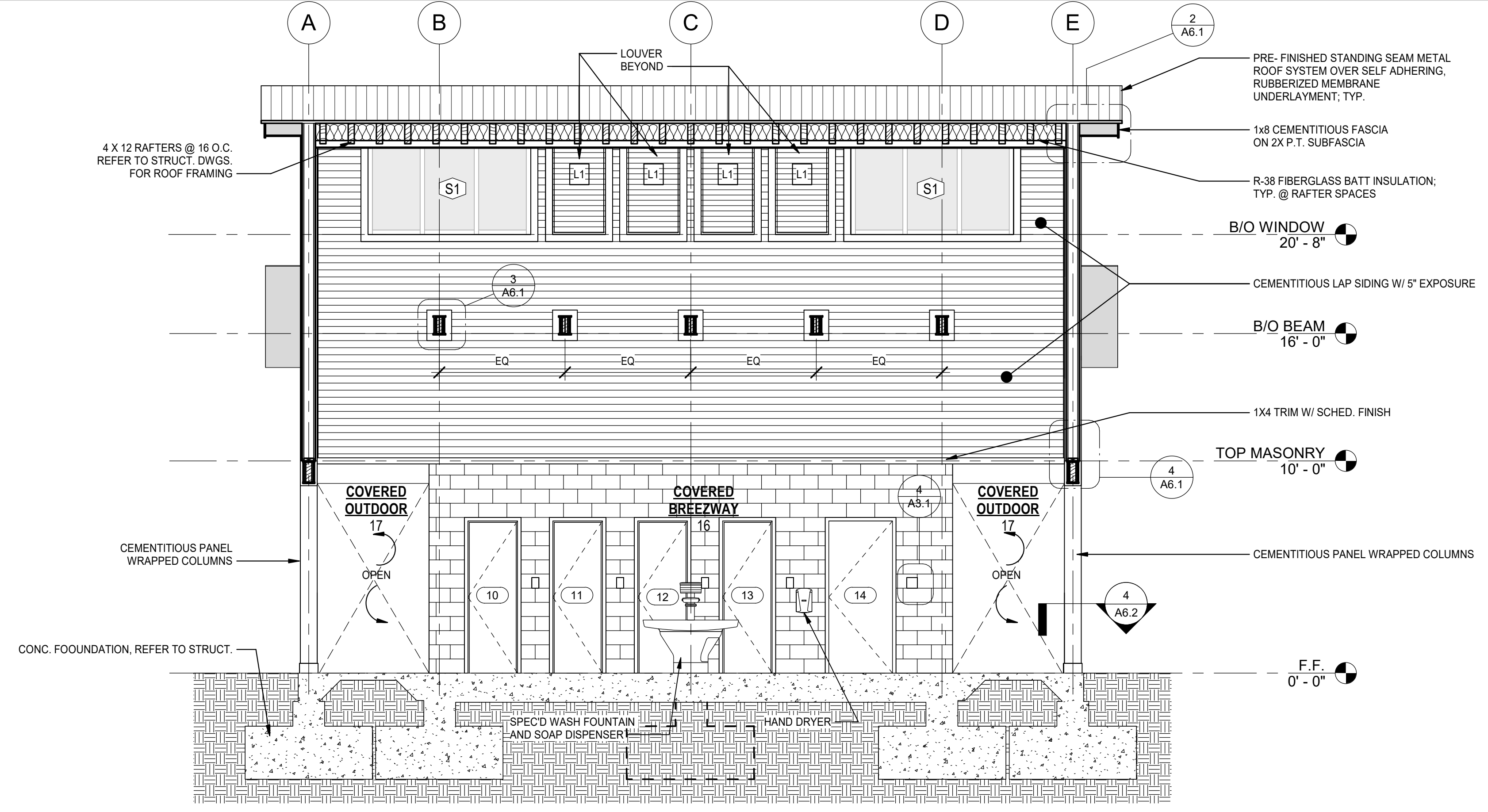


4 WEST ELEVATION
A2.1 Scale: 3/16" = 1'-0"

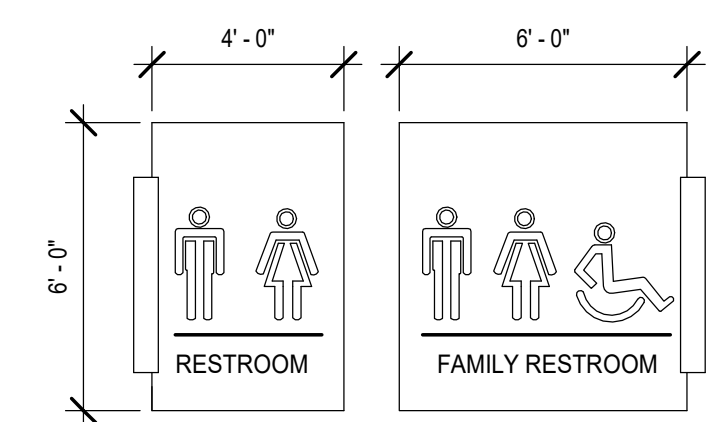




1
A3.1 LONGITUDINAL BUILDING SECTION
Scale: 1/4" = 1'-0"

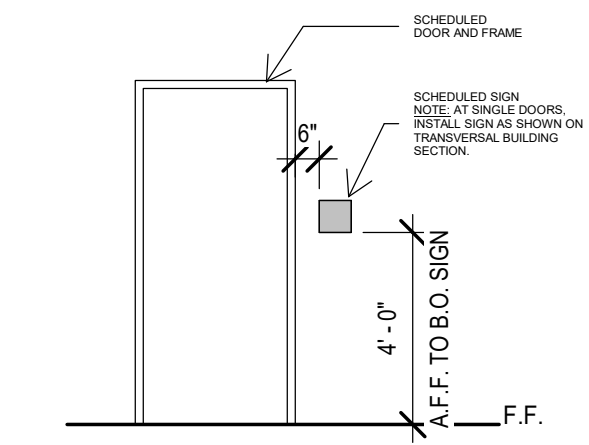


2
A3.1 TRANSVERSAL BUILDING SECTION
Scale: 1/4" = 1'-0"



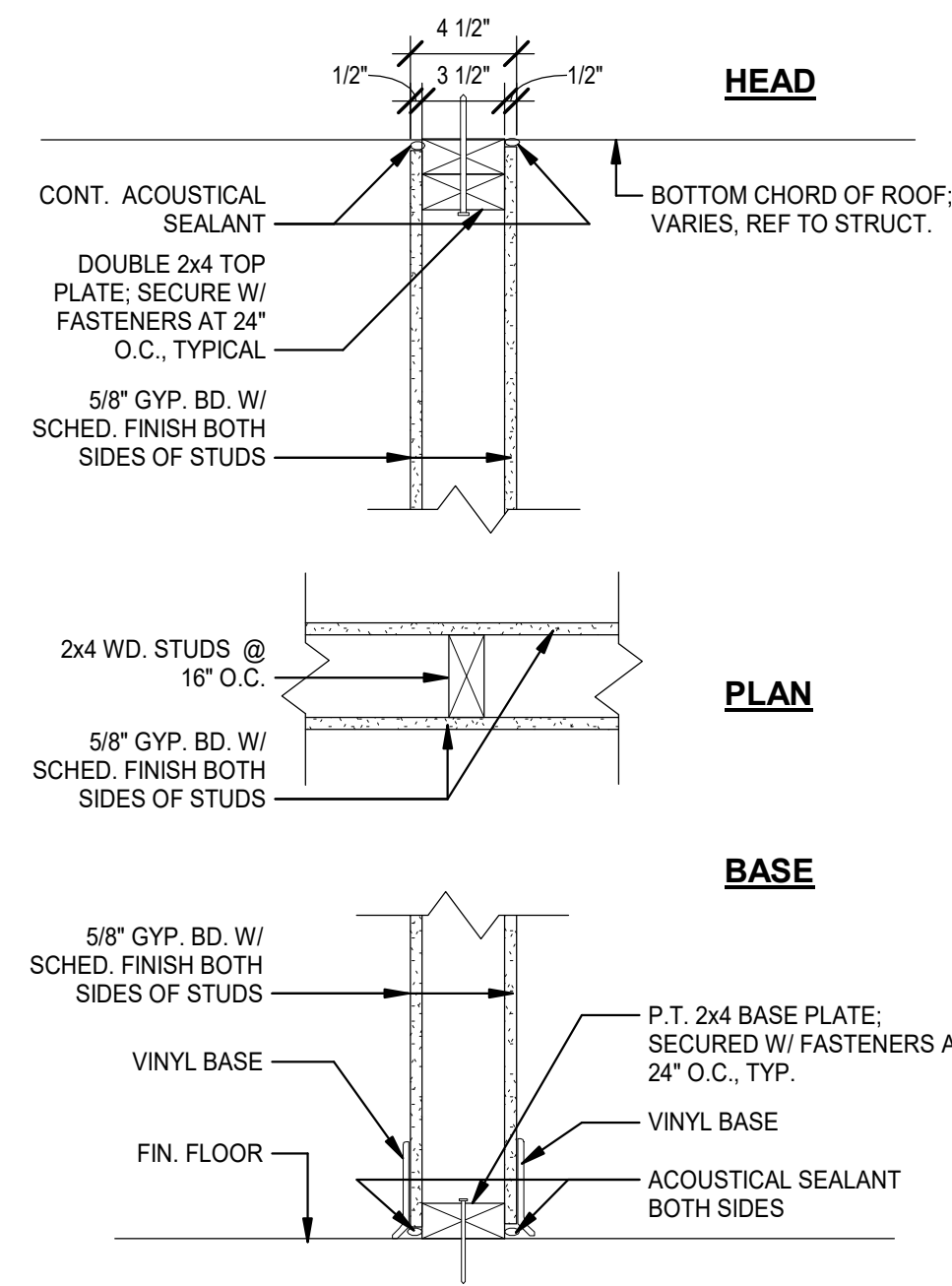
3
A3.1 SIGNAGE ELEVATION
Scale: 1/4" = 1'-0"

NOTE: COORDINATE WITH COM FOR SIGNAGE COLOR, GRAPHIC, AND TEXT STANDARDS.
TYP. ALL RESTROOM'S SIGNS

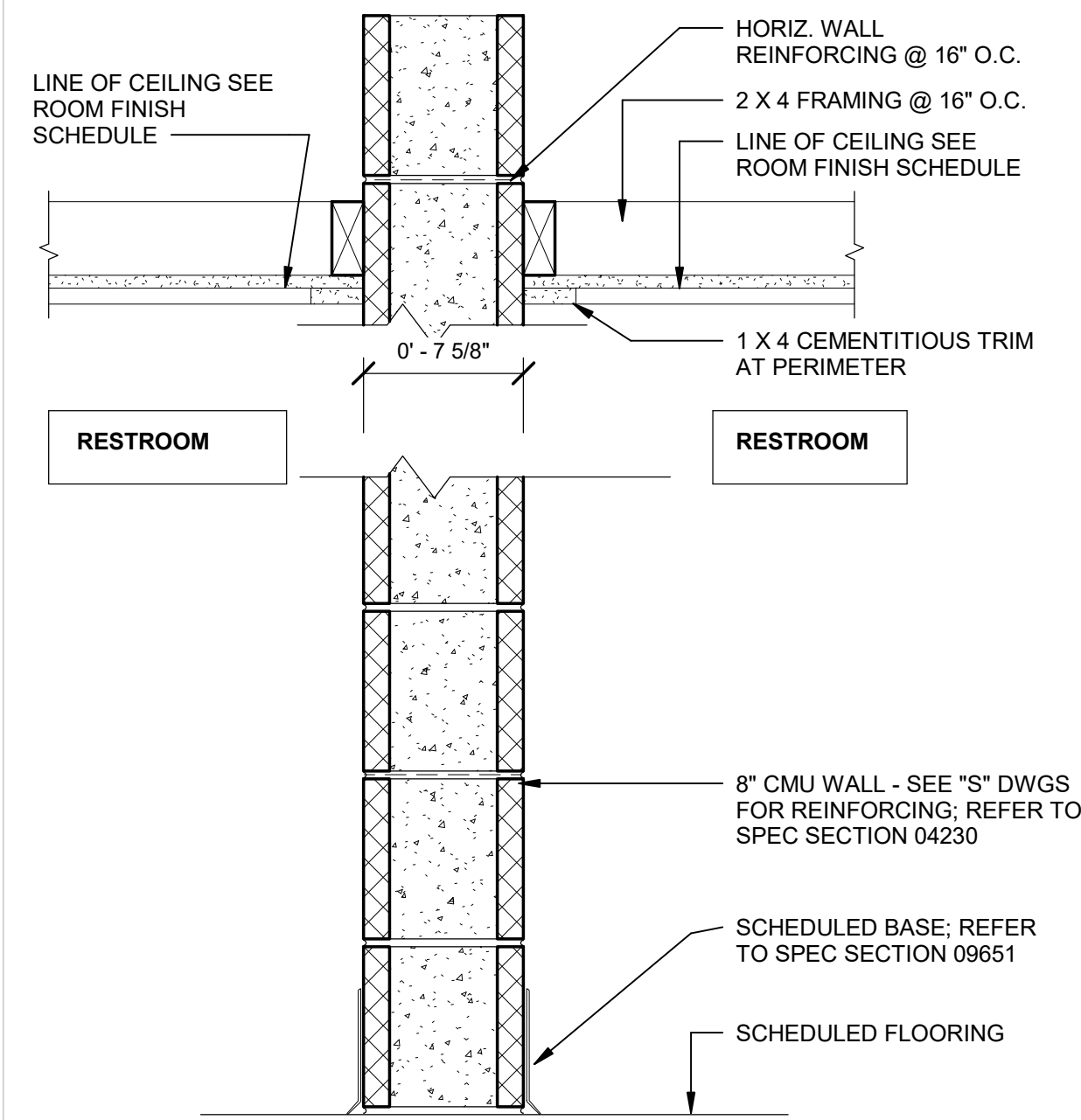


4
A3.1 SIGNAGE MOUNTING DETAIL
Scale: 1/4" = 1'-0"

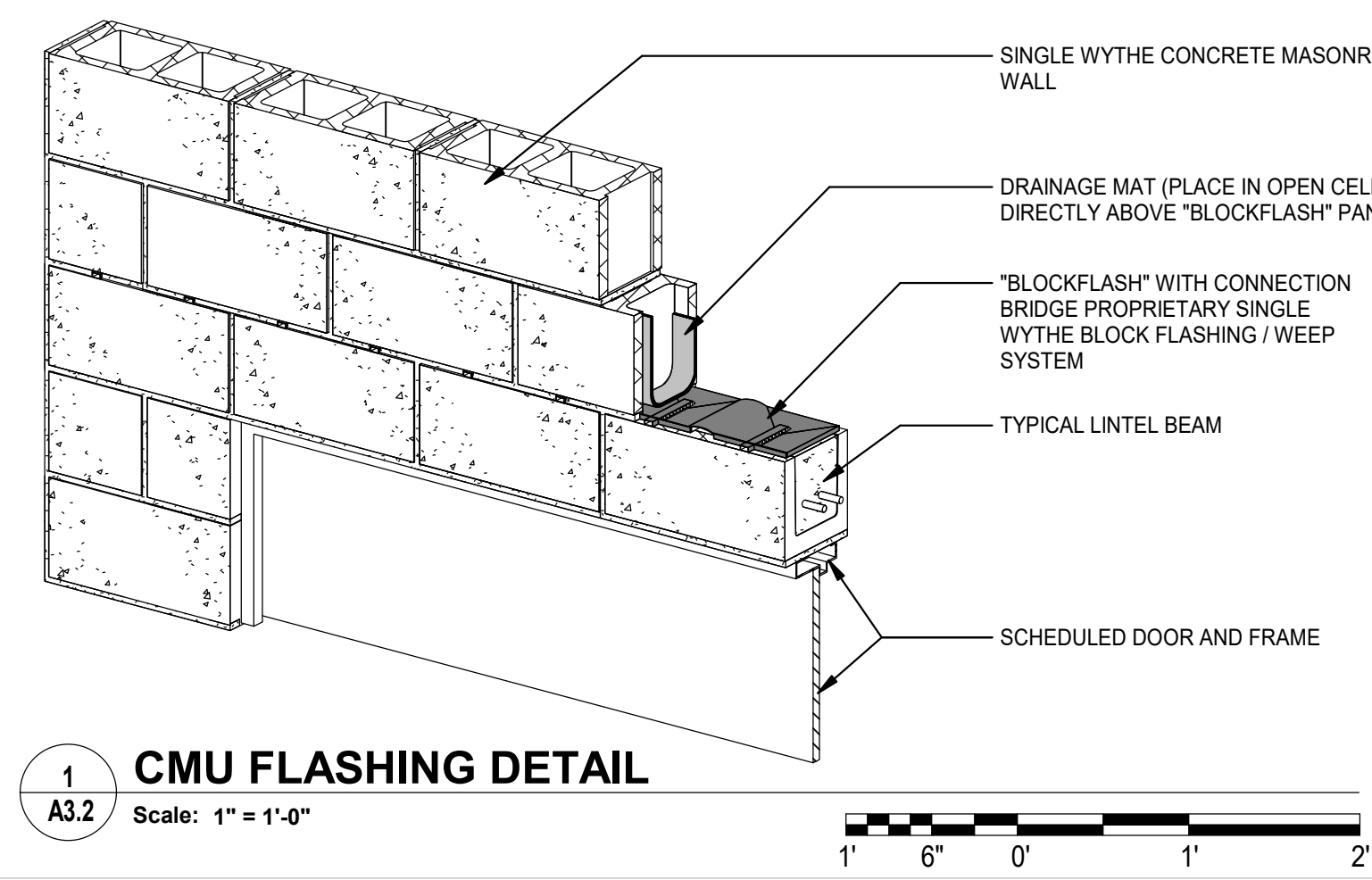




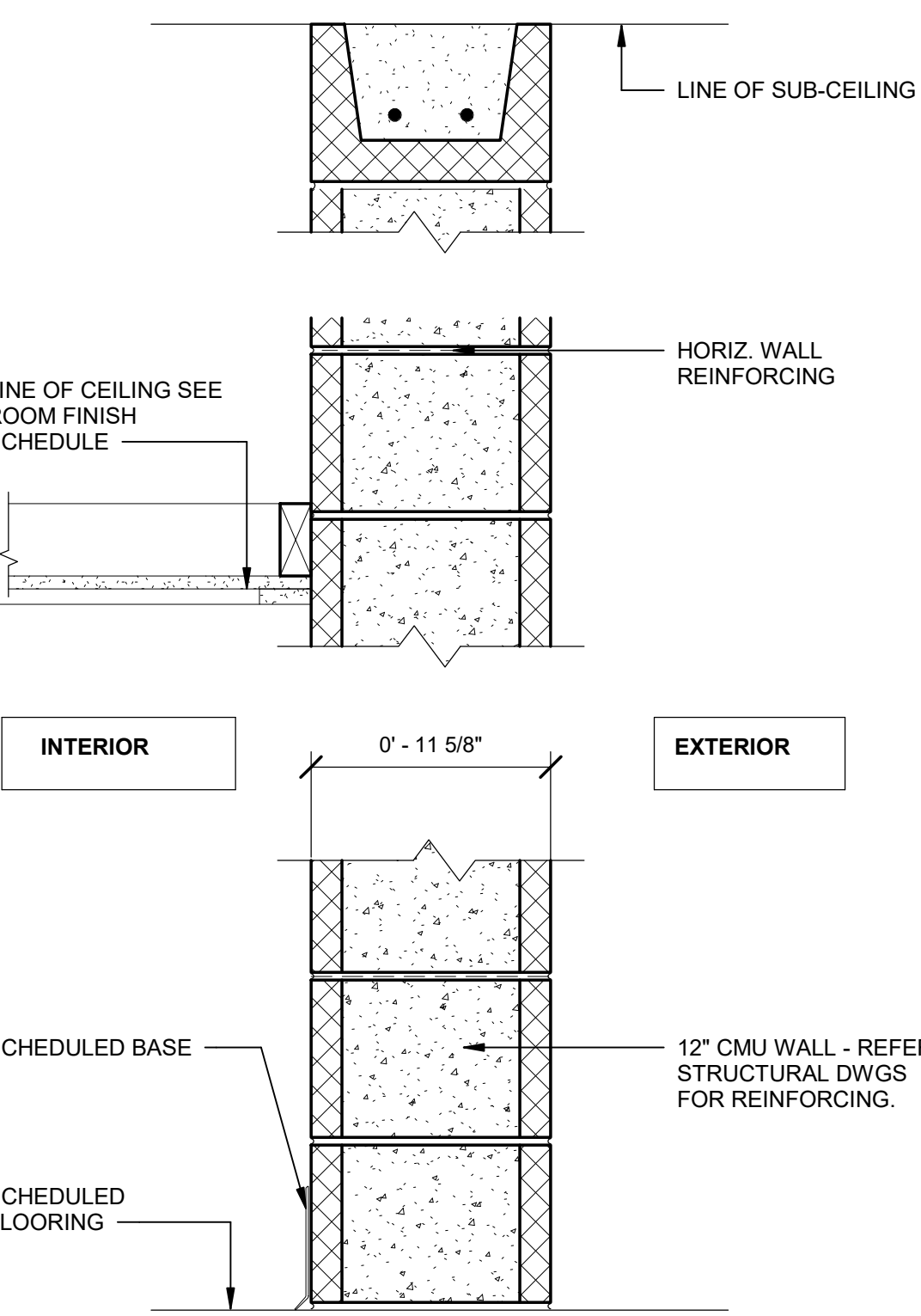
1 INTERIOR PARTITION @ CONCESSION
2x4 WOOD STUDS



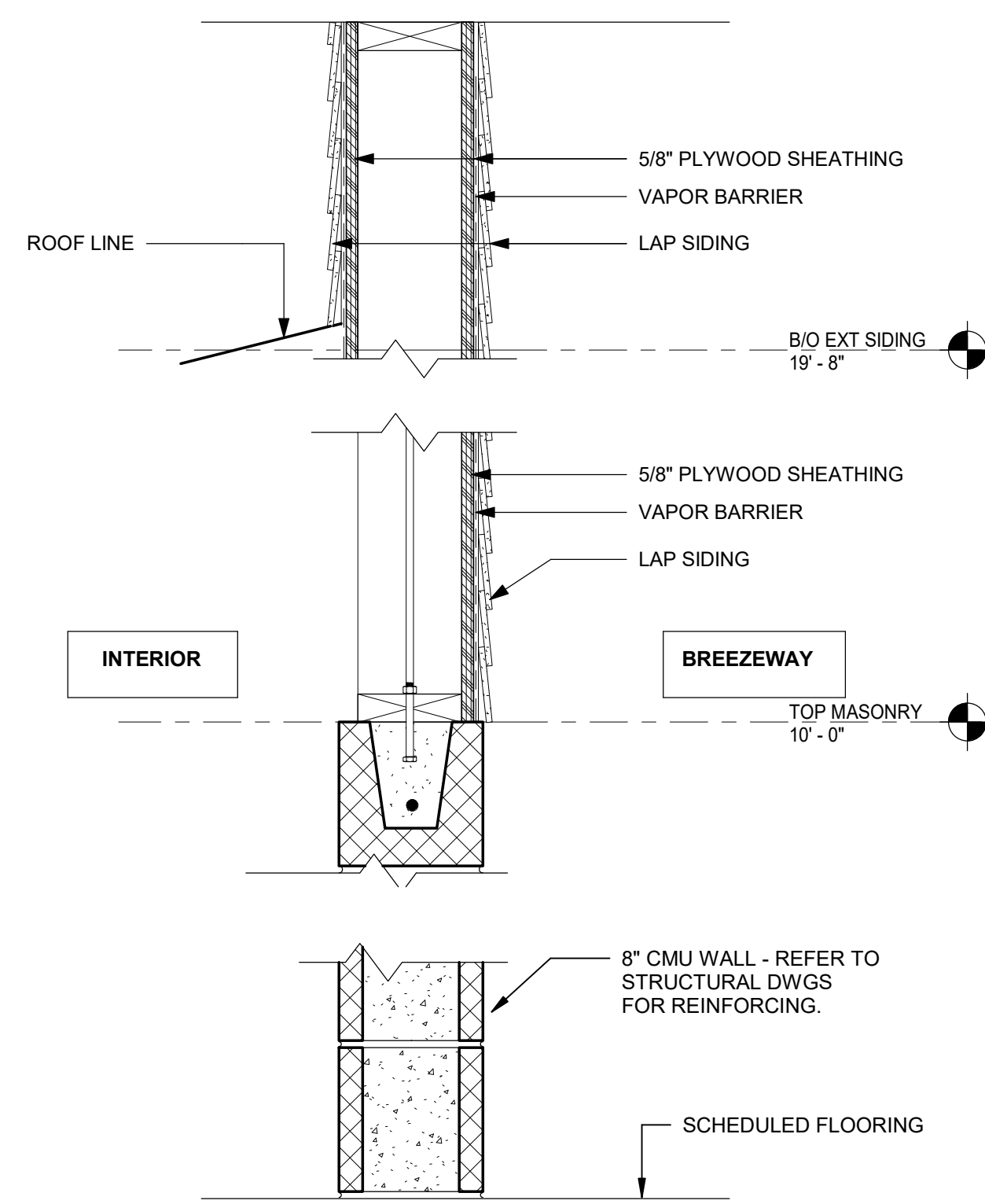
2 CMU TOILET PARTITION (INTERIOR)



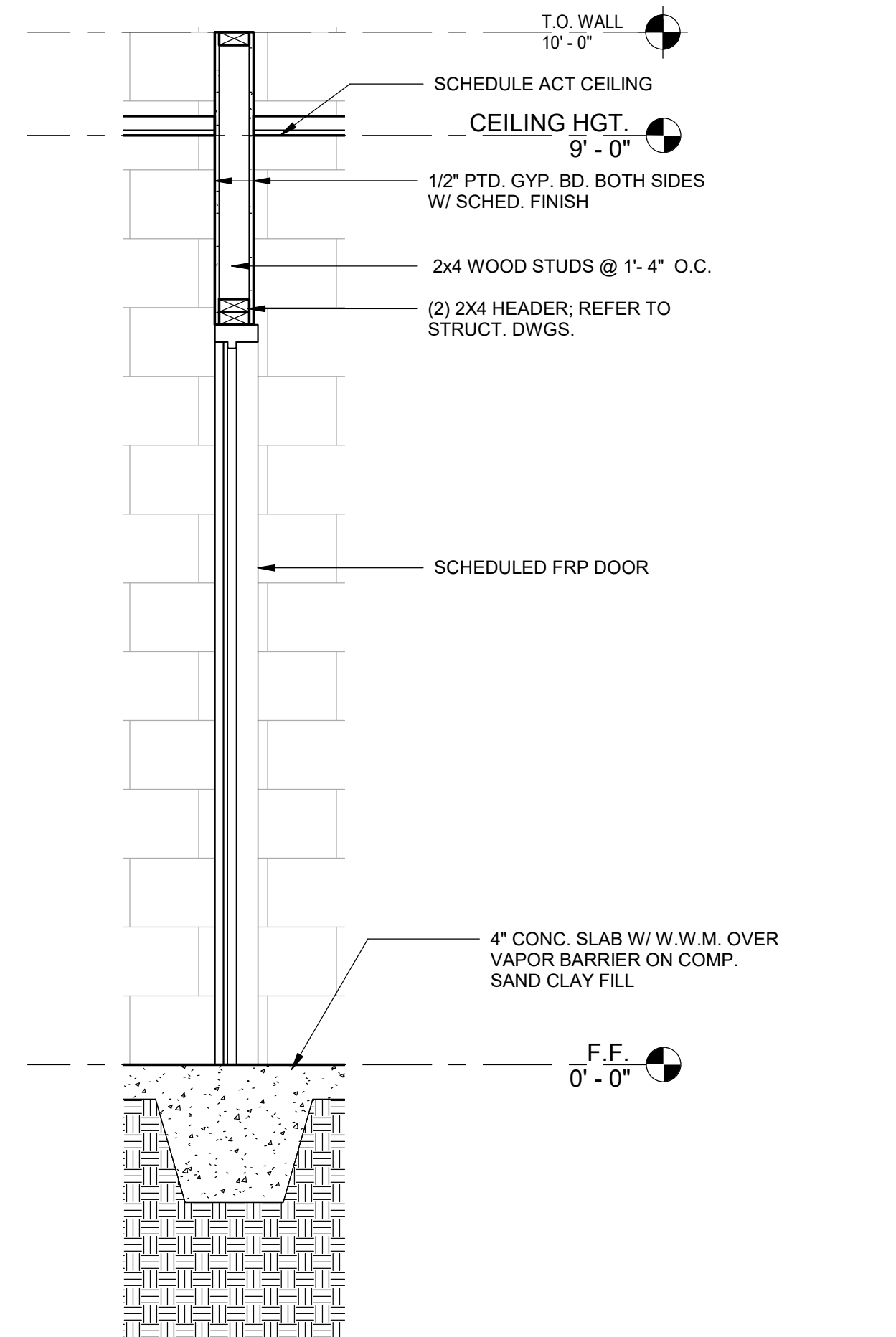
1 CMU FLASHING DETAIL
Scale: 1" = 1'-0"



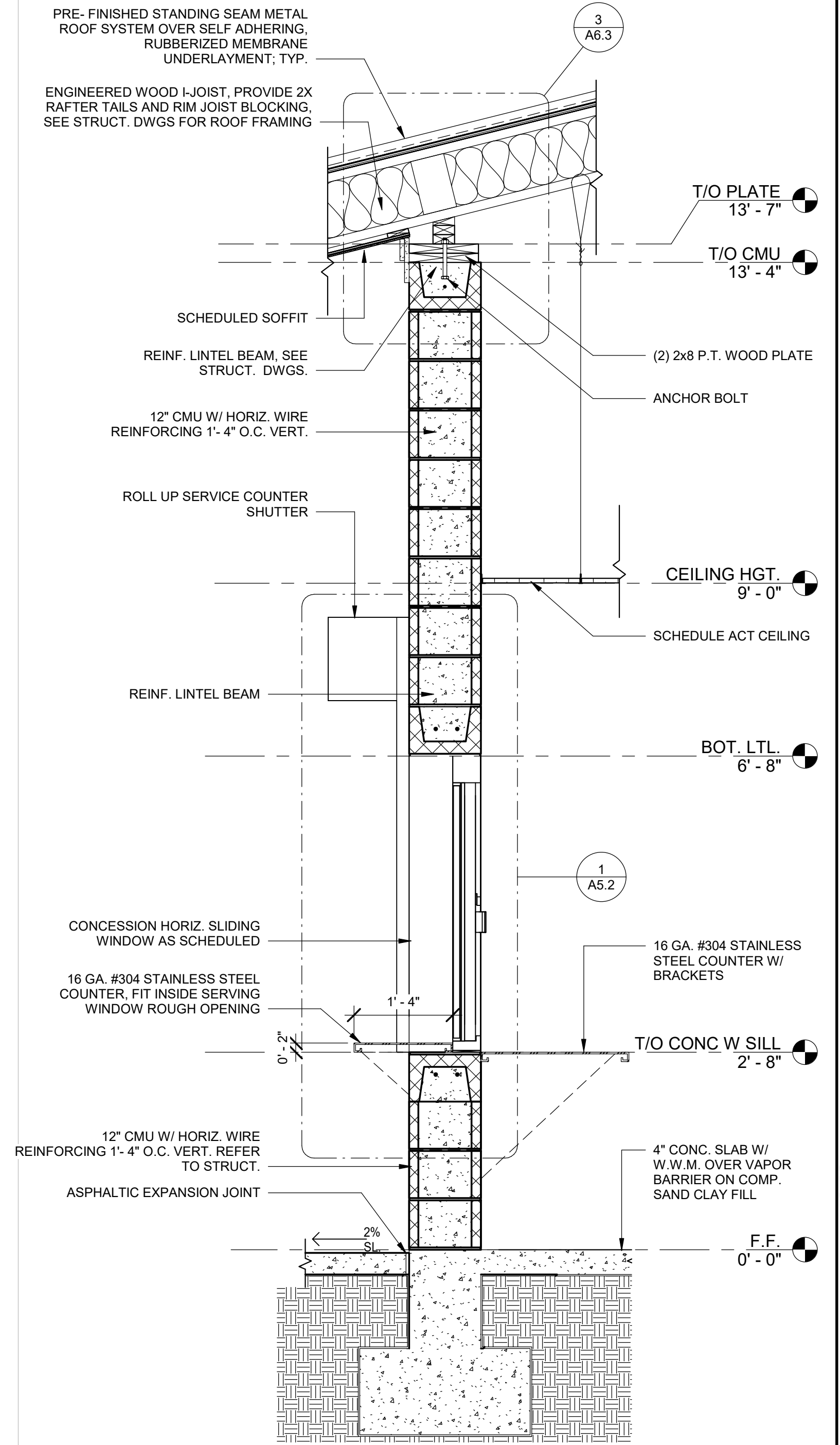
3 CMU WALL (EXTERIOR)



4 CMU WALLS @ BREEZWAY (INTERIOR)



2 INTERIOR WALL SECTION
Scale: 3/4" = 1'-0"



3 WALL SECTION @ CONCESSION
Scale: 3/4" = 1'-0"

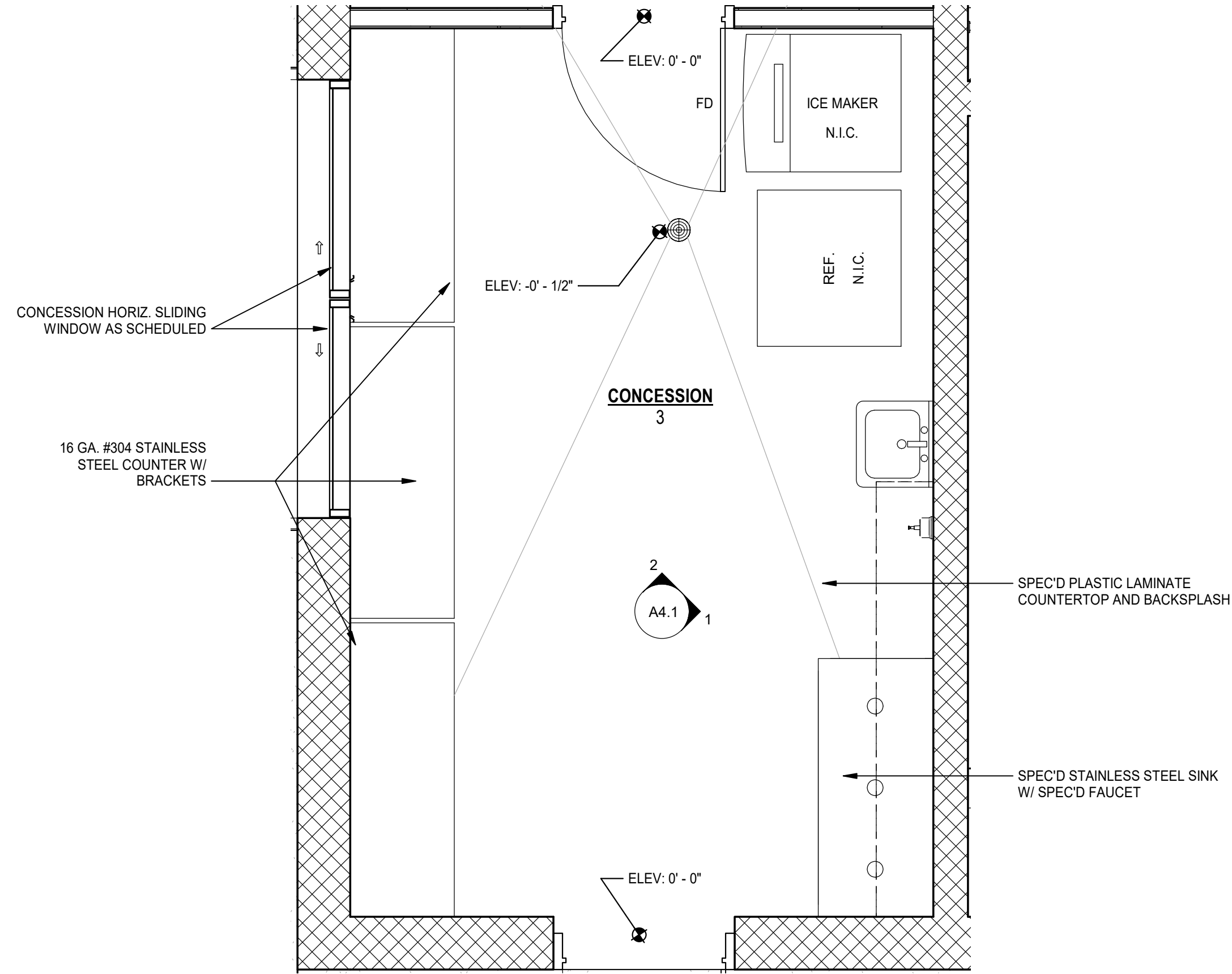
PARTITION TYPES GENERAL NOTES:

1. SEE FINISH SCHEDULE FOR FINISHES TO ALL WALLS (WALL COVERINGS, HARD TILE, WOOD, ETC.).
2. ALL INTERIOR PARTITIONS SHALL FOLLOW IBC 1607.14 (SHALL RESIST HORIZONTAL LOAD OF 5 PSF).
3. PROVIDE RESILIENT SEALANT AT ALL SOUND WALL ASSEMBLIES.
4. PROVIDE FRP PANEL FINISH ON THE INSIDE FACES OF TOILET WALLS.
5. PROVIDE CEMENTITIOUS BACKER BOARD WHERE TILE IS INSTALLED ON WALLS.

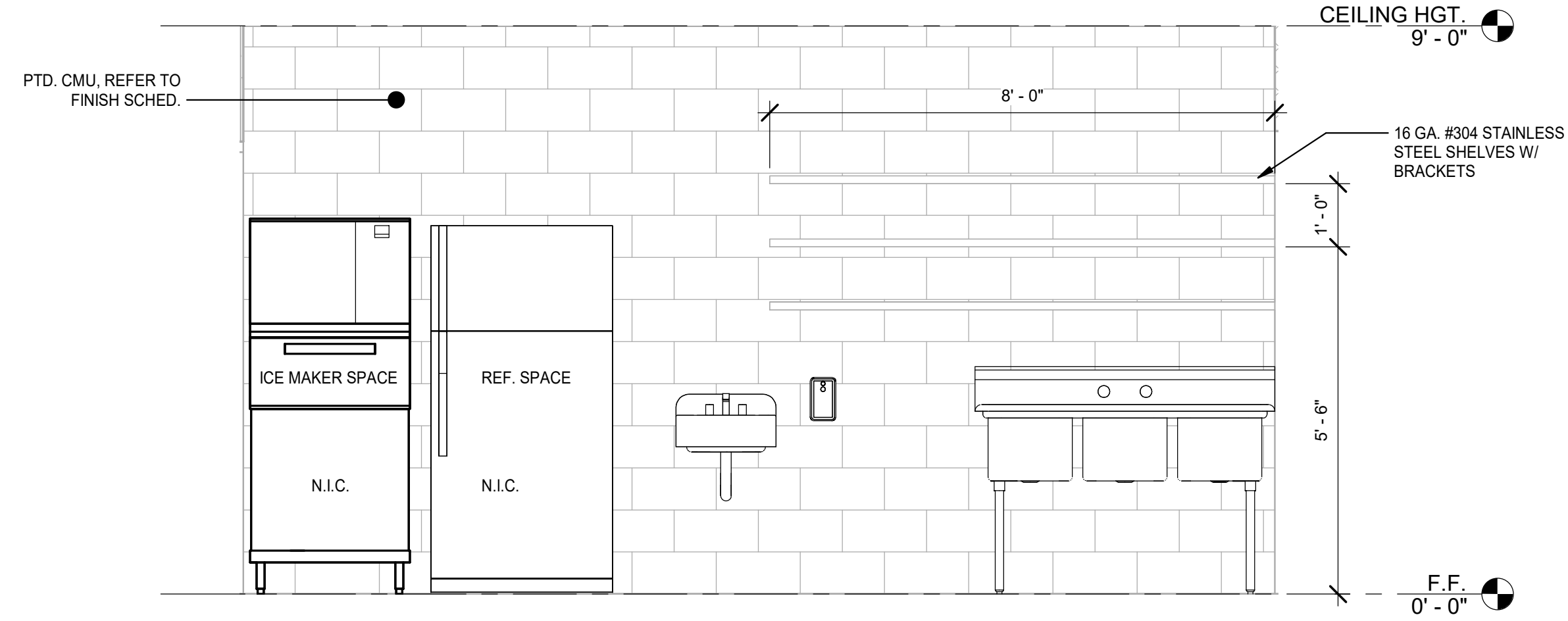
WALL TYPES

SCALE: 1 1/2" = 1'-0"



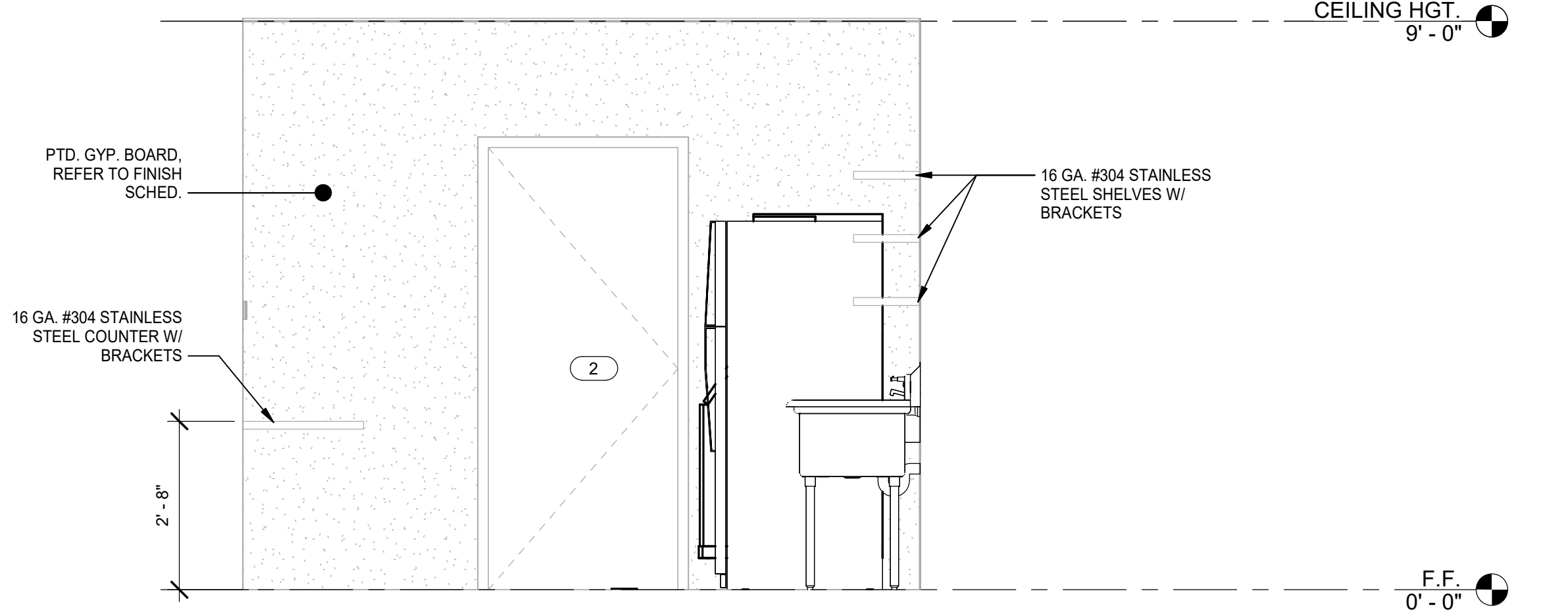
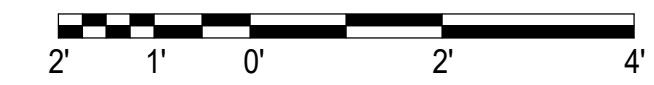


ENLARGED CONCESSION PLAN
SCALE: 1/2" = 1'-0"



1 EAST INTERIOR ELEV @ CONCESSION

Scale: 1/2" = 1'-0"



2 NORTH INTERIOR ELEV @ CONCESSION

Scale: 1/2" = 1'-0"



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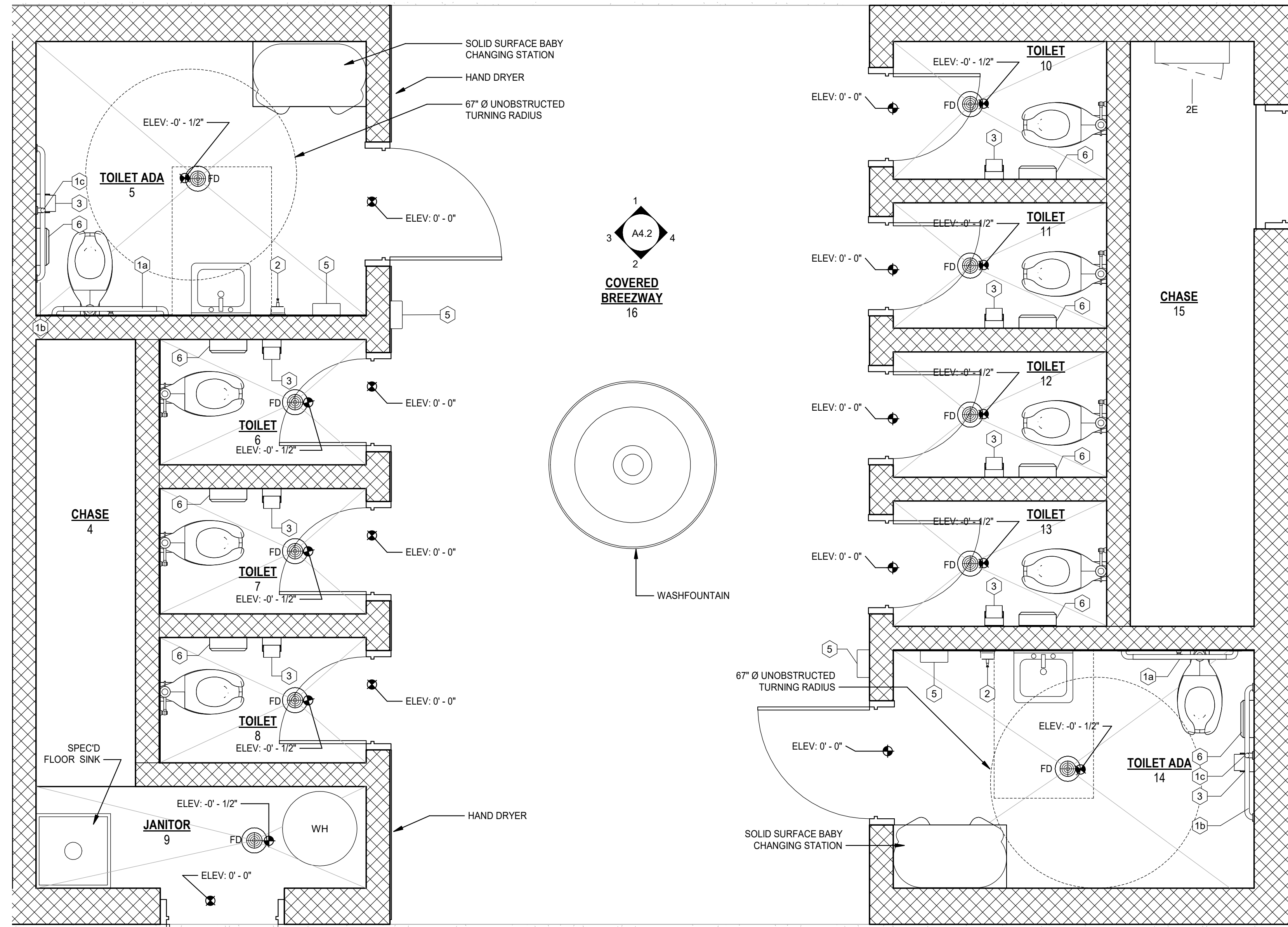
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UNLESS OTHERWISE NOTED.

LEGEND:

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- STUD WALL - INSULATED
- MASONRY WALL
- CONCRETE SLAB
- WINDOW - SEE SCHEDULE
- DOOR - SEE SCHEDULE
- FLOOR DRAIN
- INDICATES PARTITION TYPE; SEE PARTITION TYPES SHEET A4.2



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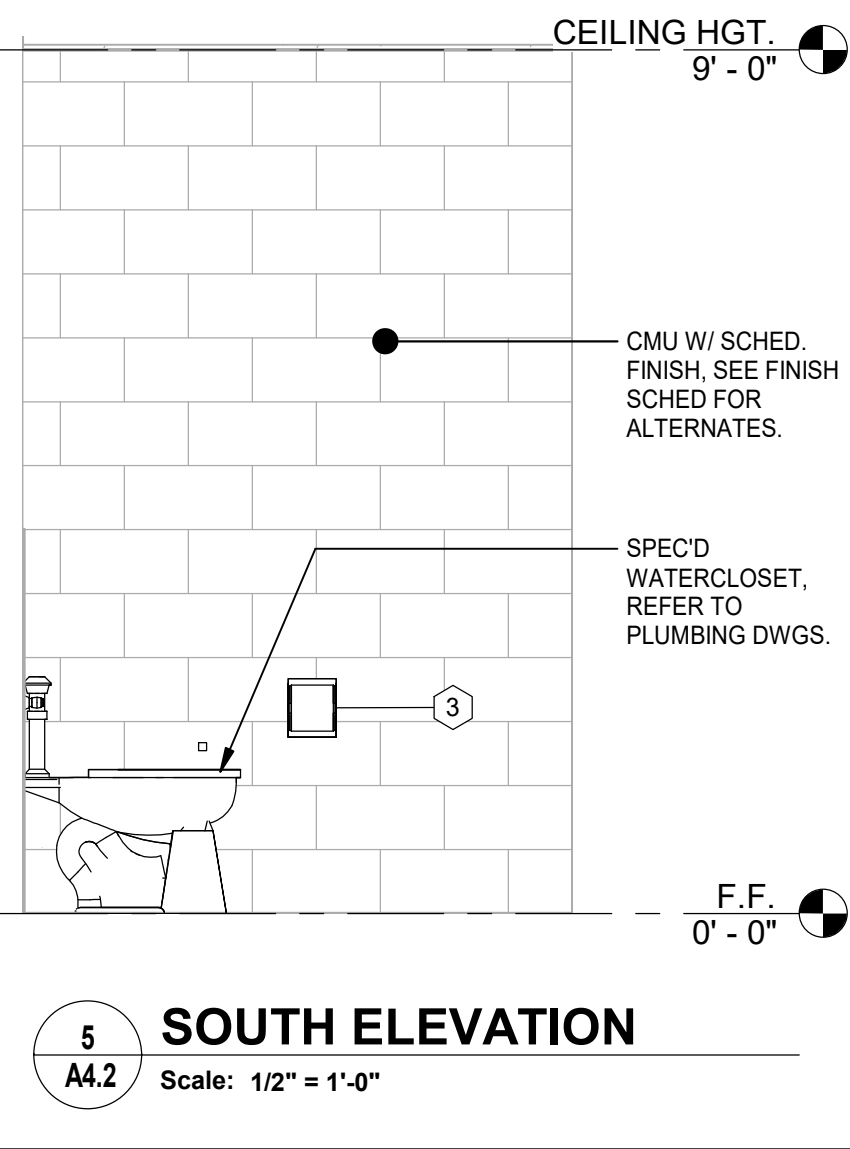
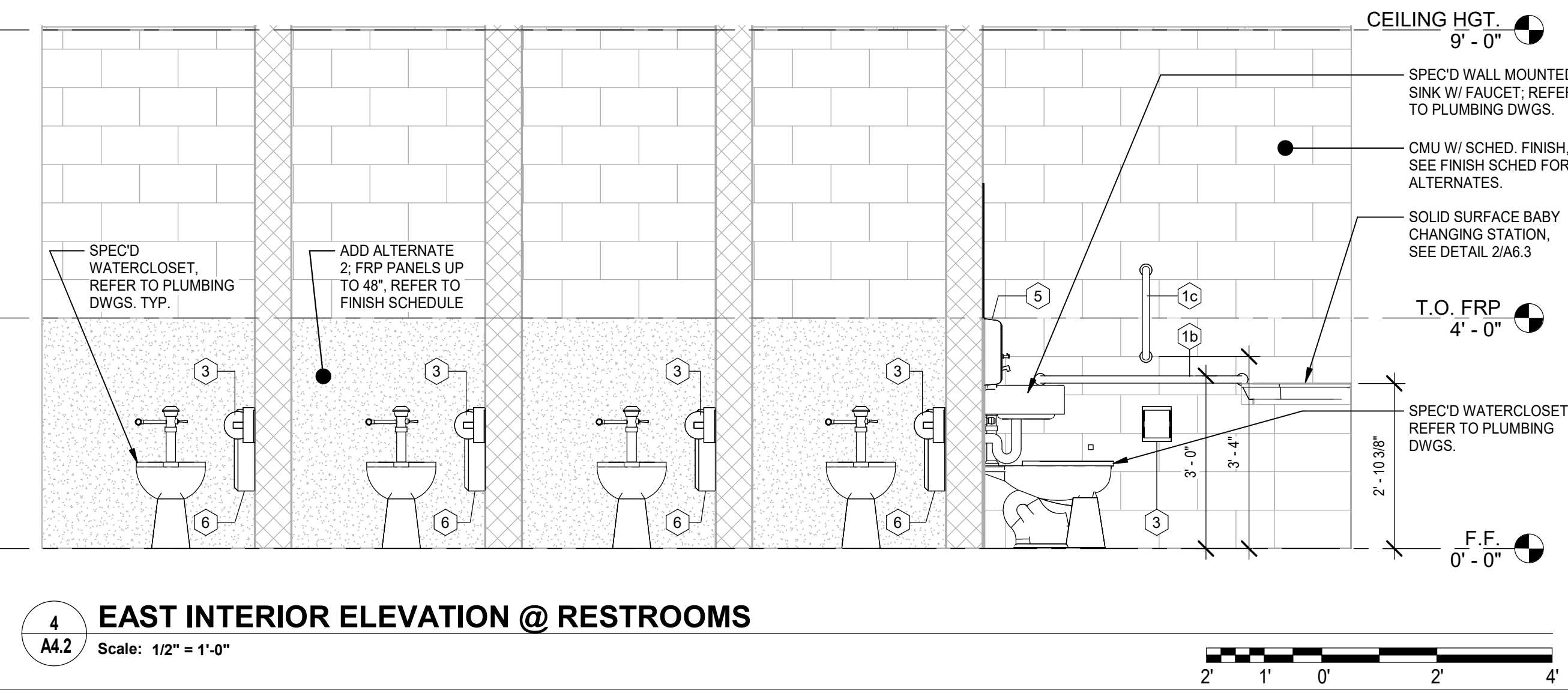
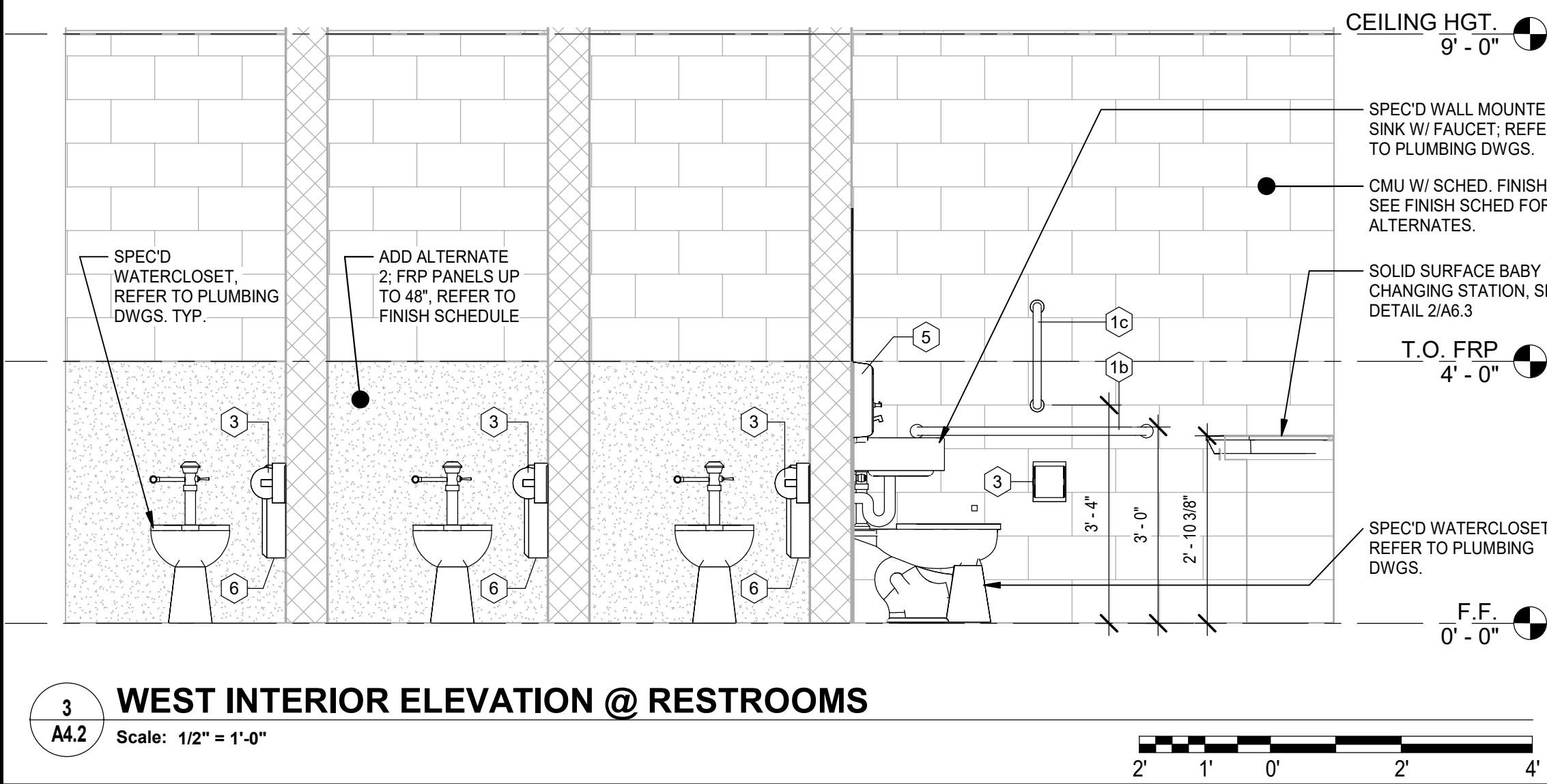
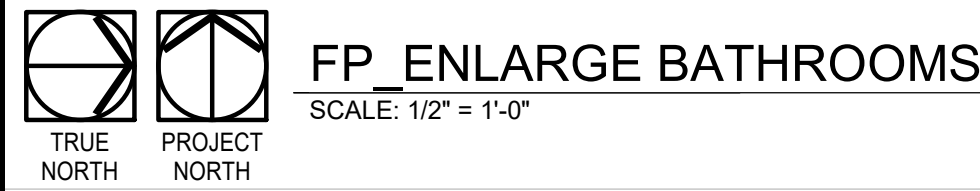
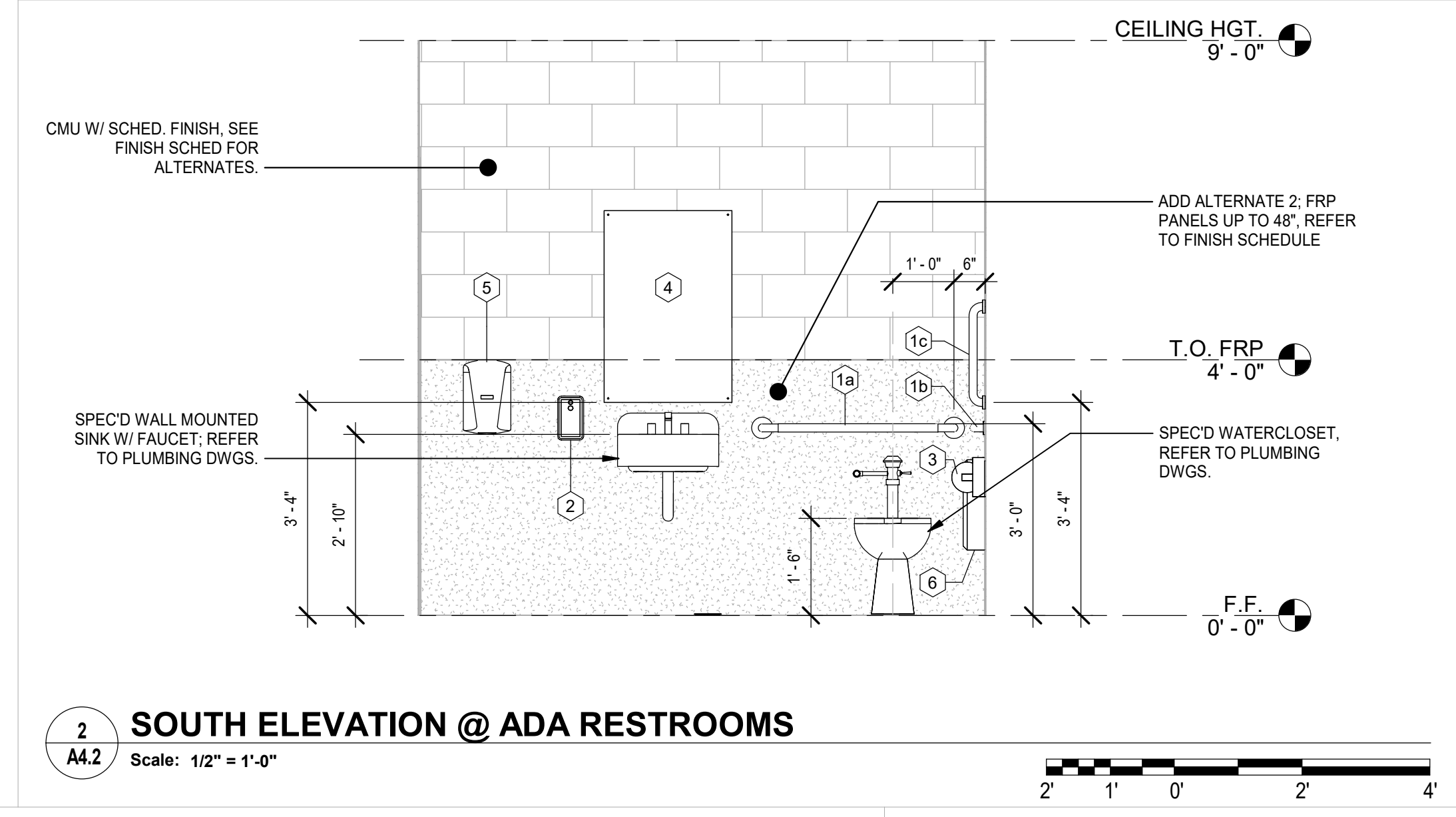
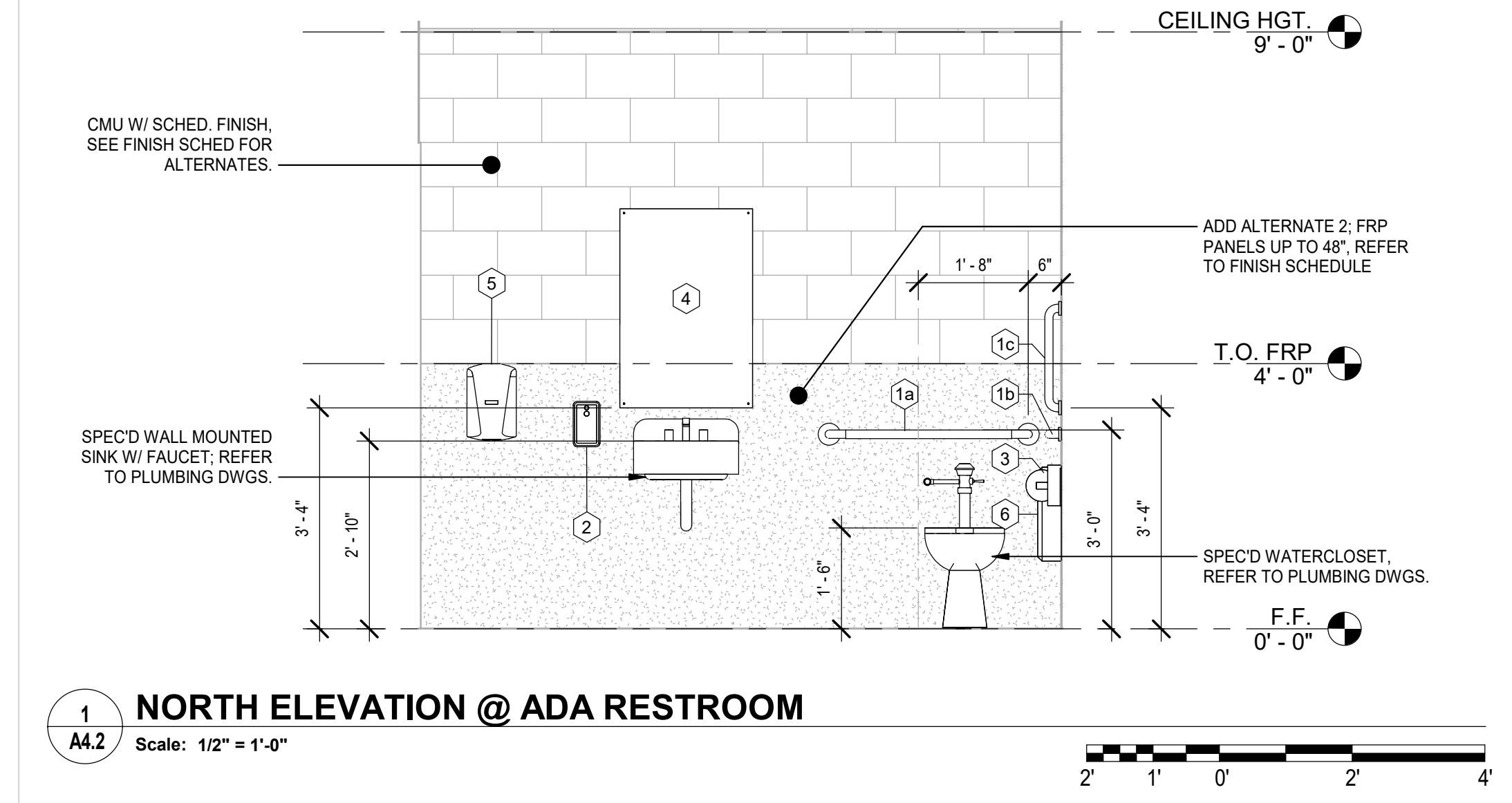
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TOILET ACCESSORIES SCHEDULE

SYMBOL	DESCRIPTION	MODEL	REMARKS
1a	36" GRAB BAR	BRADLEY #812-000-36-2	MNT. @ 36" A.F.F.
1b	42" GRAB BAR	BRADLEY #812-000-42-2	MNT. @ 36" A.F.F.
1c	18" GRAB BAR	BRADLEY #812-000-18-2	MNT. @ 40" A.F.F.
2	SOAP DISPENSER	BRADLEY #6562	SEE ELEVATIONS
3	TOILET TISSUE DISPENSER	REFER TO SPECS	MNT. CL @ 19"
4	STAINLESS STEEL MIRROR	BRADLEY #748-0XXXX0	STAINLESS STEEL MIRROR
5	ThinAir Series	HAND DRYER, REFER TO SPECS	SEE ELEVATIONS
6	SANITARY NAPKIN HOLDER	REFER TO SPECS	SEE ELEVATIONS



ARCHITECTURAL DRAWINGS FOR:
CITY OF MOBILE- MIMS PARK
 Mobile, AL 36693



DATE: May 5, 2024
 SCALE: 1/2" = 1'-0"
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A4.2

DOOR SCHEDULE

MARK	ROOM NAME	DOORS						FRAME						FIRE RATING	HARDWARE SET NO.	REMARKS
		SIZE		ELEV	MATERIAL	FINISH	GLAZING	TYPE	MATERIAL	FINISH	DETAIL					
		WIDTH	HEIGHT								HEAD	JAMB	SILL			
2	STORAGE	3' - 0"	7' - 0"	A	GHM	FACTORY	--	1	GHM	FACTORY	1/A4.1	2/A4.1	3/A4.1	-	1	ALTERNATE REPLACE GHM DOORS AND FREME WITH FRP DOORS AND FRAMES
3	CONCESSION	3' - 0"	7' - 2"	A	GHM	FACTORY	--	1	GHM	FACTORY	1/A4.2	2/A4.2	1/A4.2		2	ALTERNATE REPLACE GHM DOORS AND FREME WITH FRP DOORS AND FRAMES
5	TOILET ADA	3' - 0"	7' - 2"	A	GHM	FACTORY	--	1	GHM	FACTORY	3/A4.2	4/A4.2	5/A4.2		3	ALTERNATE REPLACE GHM DOORS AND FREME WITH FRP DOORS AND FRAMES
6	TOILET	2' - 4"	7' - 2"	A	GHM	FACTORY	--	1	GHM	FACTORY	3/A4.2	4/A4.2	5/A4.2		3	ALTERNATE REPLACE GHM DOORS AND FREME WITH FRP DOORS AND FRAMES
7	TOILET	2' - 4"	7' - 2"	A	GHM	FACTORY	--	1	GHM	FACTORY	3/A4.2	4/A4.2	5/A4.2		3	ALTERNATE REPLACE GHM DOORS AND FREME WITH FRP DOORS AND FRAMES
8	TOILET	2' - 4"	7' - 2"	A	GHM	FACTORY	--	1	GHM	FACTORY	3/A4.2	4/A4.2	5/A4.2		3	ALTERNATE REPLACE GHM DOORS AND FREME WITH FRP DOORS AND FRAMES
9	JANITOR	3' - 0"	7' - 2"	A	GHM	FACTORY	--	1	GHM	FACTORY	3/A4.2	4/A4.2	5/A4.2		1	ALTERNATE REPLACE GHM DOORS AND FREME WITH FRP DOORS AND FRAMES
10	TOILET	2' - 4"	7' - 2"	A	GHM	FACTORY	--	1	GHM	FACTORY	3/A4.2	4/A4.2	5/A4.2		3	ALTERNATE REPLACE GHM DOORS AND FREME WITH FRP DOORS AND FRAMES
11	TOILET	2' - 4"	7' - 2"	A	GHM	FACTORY	--	1	GHM	FACTORY	3/A4.2	4/A4.2	5/A4.2		3	ALTERNATE REPLACE GHM DOORS AND FREME WITH FRP DOORS AND FRAMES
12	TOILET	2' - 4"	7' - 2"	A	GHM	FACTORY	--	1	GHM	FACTORY	3/A4.2	4/A4.2	5/A4.2		3	ALTERNATE REPLACE GHM DOORS AND FREME WITH FRP DOORS AND FRAMES
13	TOILET	2' - 4"	7' - 2"	A	GHM	FACTORY	--	1	GHM	FACTORY	3/A4.2	4/A4.2	5/A4.2		3	ALTERNATE REPLACE GHM DOORS AND FREME WITH FRP DOORS AND FRAMES
14	TOILET ADA	3' - 0"	7' - 2"	A	GHM	FACTORY	--	1	GHM	FACTORY	3/A4.2	4/A4.2	5/A4.2		3	ALTERNATE REPLACE GHM DOORS AND FREME WITH FRP DOORS AND FRAMES
15	CHASE	3' - 0"	7' - 2"	A	GHM	FACTORY	--	1	GHM	FACTORY	3/A4.2	4/A4.2	5/A4.2		1	ALTERNATE REPLACE GHM DOORS AND FREME WITH FRP DOORS AND FRAMES

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GENERAL NOTES:

- DOORS AND WINDOWS SHALL BE INSTALLED PER CODE APPROVED FASTENERS AND MANUFACTURER'S INSTRUCTIONS TO MEET THE DESIGN WIND PRESSURES.
- REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION ON WIND PRESSURES.
- OVERALL DIMENSIONS GIVEN ARE FOR ROUGH OPENINGS.
- CONTRACTOR TO VERIFY ALL DOOR AND WINDOW SIZES, ROUGH OPENING, ETC. PRIOR TO ORDERING. THE ARCHITECT IS TO BE NOTIFIED OF ANY DESIGN CONFLICTS.
- PRIOR TO FABRICATION, ALL DOOR AND WINDOW OPENINGS TO BE FIELD VERIFIED TO MEET MANUFACTURERS TOLERANCES FOR HEAD, JAMB AND SILL CONDITIONS.
- ALL CURTAIN WALL FRAMING, STOREFRONT FRAMING, BRACE METAL ENCLOSURES, GYPSUM BOARD RECEIVERS AND ALUMINUM EXTRUSIONS ARE TO HAVE MATCHING FINISHES, UNLESS NOTED OTHERWISE.
- REFER TO SPECIFICATIONS AND FINISH SCHEDULE FOR DOOR AND FRAME FINISHES.
- UNLESS OTHERWISE NOTED, GLAZING ELEVATIONS SHOWN FROM EXTERIOR SIDE.

ABBREVIATIONS:

AL ALUMINUM	HM HOLLOW METAL
AM ANTI-MICROBIAL FINISH	HO HOLD OPEN
AO AUTOMATIC OPERATOR	IA INFANT ABDUCTION
AP ARMOR PLATE	JP JAMB PROTECTORS
AT ACOUSTICAL TREATMENT	KP KICK PLATE
CH CONTINUOUS HINGE	LL LEAD LINED
CK COAT HOOK	ML MAGNETIC LOCK
CL CLOSER	MP MOP PLATE
CR CARD READER	MTL METAL
DA DOUBLE ACTING	PP PUSH PLATE
DE DOUBLE EGRESS	PA PANIC HARDWARE
DO DOOR OPERATOR	SCWD SOLID CORE WOOD
EG EDGE GUARD	SG SAFETY GLASS
FRP FIBERGLASS REINFORCED PLASTIC	SS STAINLESS STEEL
GL GLASS / GLAZING	VL VISION LIGHT
	WD WOOD
	ST STAIN

GLAZING INDEX:

- CLEAR TEMPERED GLASS, RE: SPECIFICATIONS
- CLEAR LAMINATED TEMPERED GLASS, RE: SPECIFICATIONS
- INSULATED LAMINATED GLASS UNITS (IMPACT RATED), RE: SPECIFICATIONS
- INSULATED LAMINATED GLASS SPANDREL UNITS (IMPACT RATED), RE: SPECIFICATIONS

HARDWARE SCHEDULE:

HARDWARE SET #1

LOCKSET:	STORAGE
BUTTS:	1 1/2 PAIR
SILENCER:	2 EACH

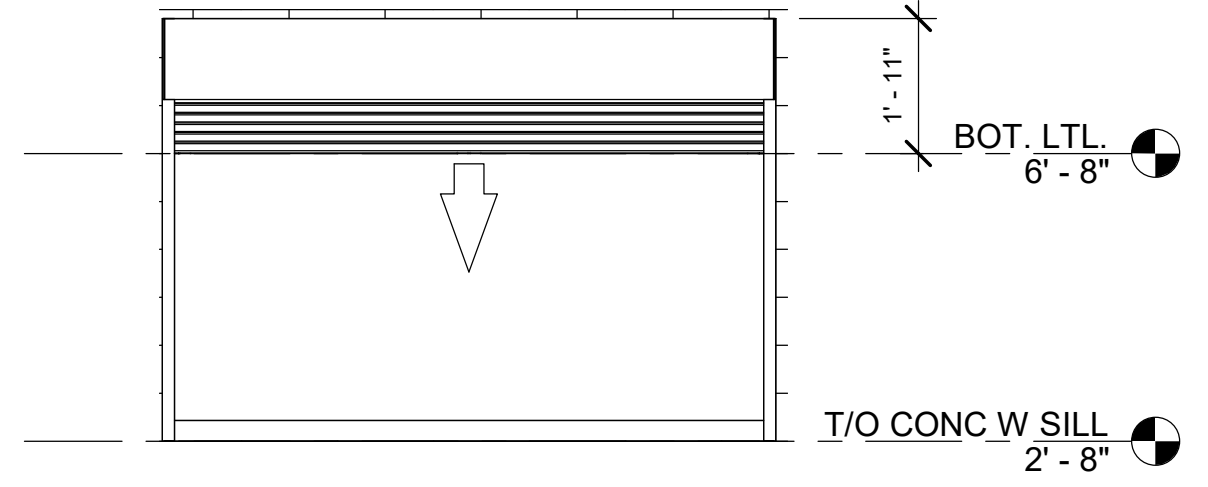
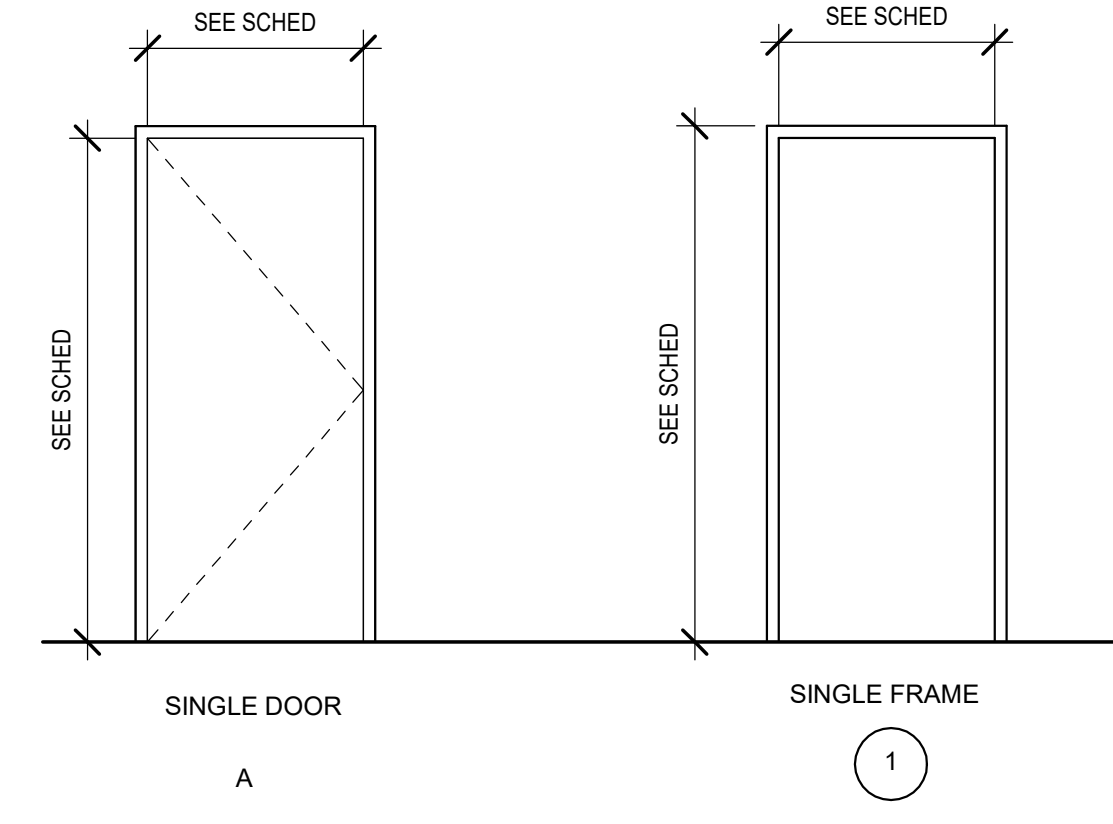
HARDWARE SET #2

LOCKSET:	STORAGE
BUTTS:	1 1/2 PAIR
SILENCER:	2 EACH
CLOSER:	1 EACH
WEATHERSTRIP:	1 EACH

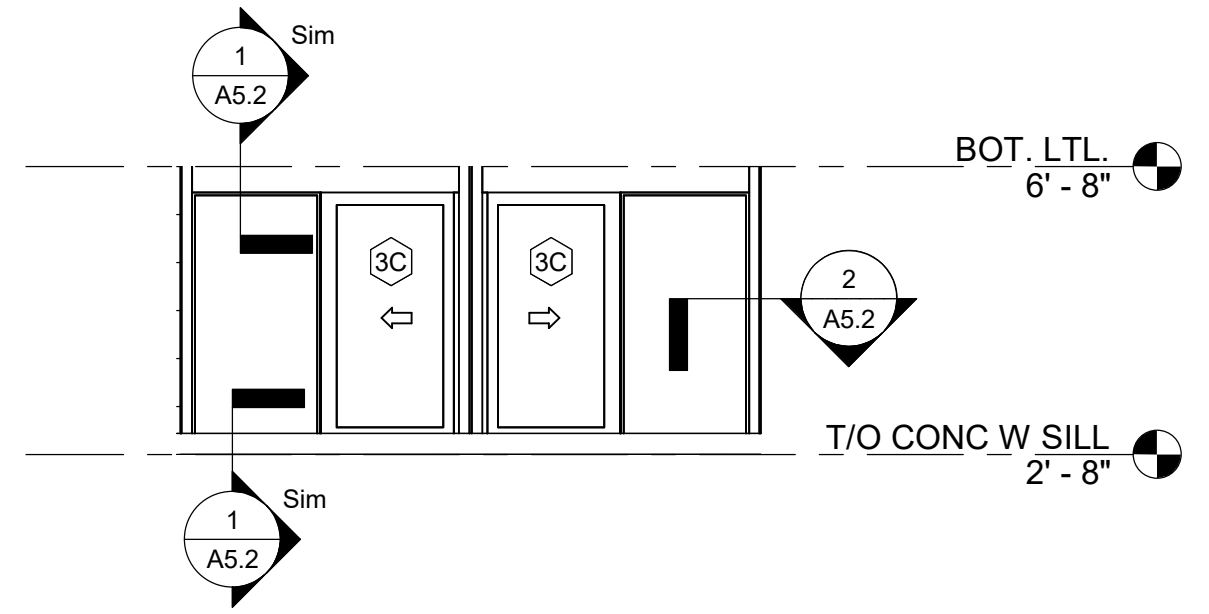
HARDWARE SET #3

LOCKSET:	PRIVACY
BUTTS:	1 1/2 PAIR
CLOSER:	1 EACH
SILENCER:	3 EACH

- NOTE:
- ALL HARDWARE TO COME WITH CONSTRUCTION CORES AND NEW CORES TO BE TURNED INTO THE OWNER UPON DELIVERY FOR KEYING.
 - ALL HARDWARE TO BE LEVER ACTION AND IN BRUSHED NICKEL.

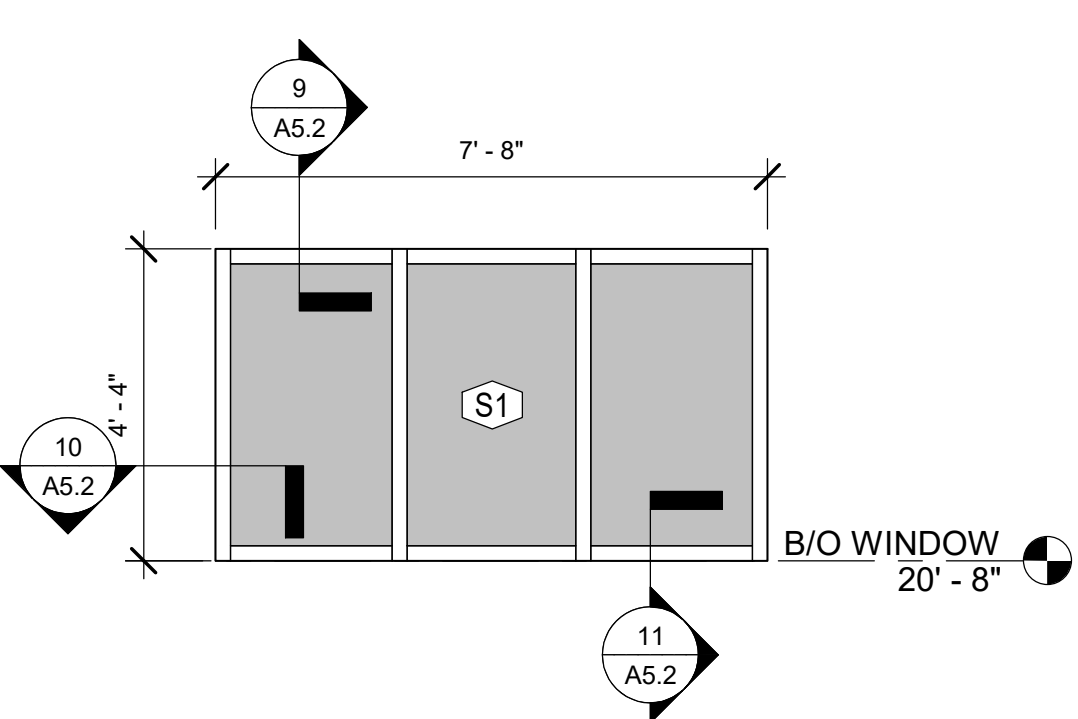


LEGEND - GRAPHIC DOOD & FRAME SCHEDULE
SCALE: 3/8" = 1'-0"

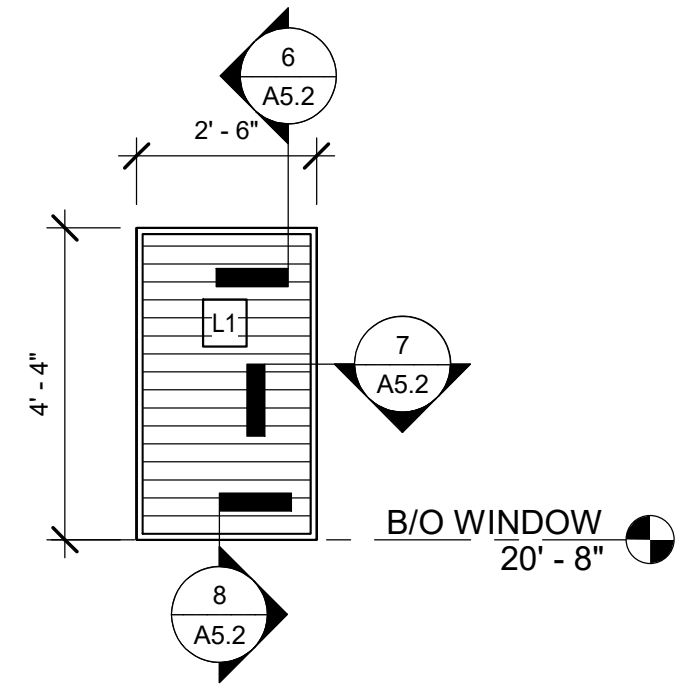


EE_CONC WINDOW
SCALE: 3/8" = 1'-0"

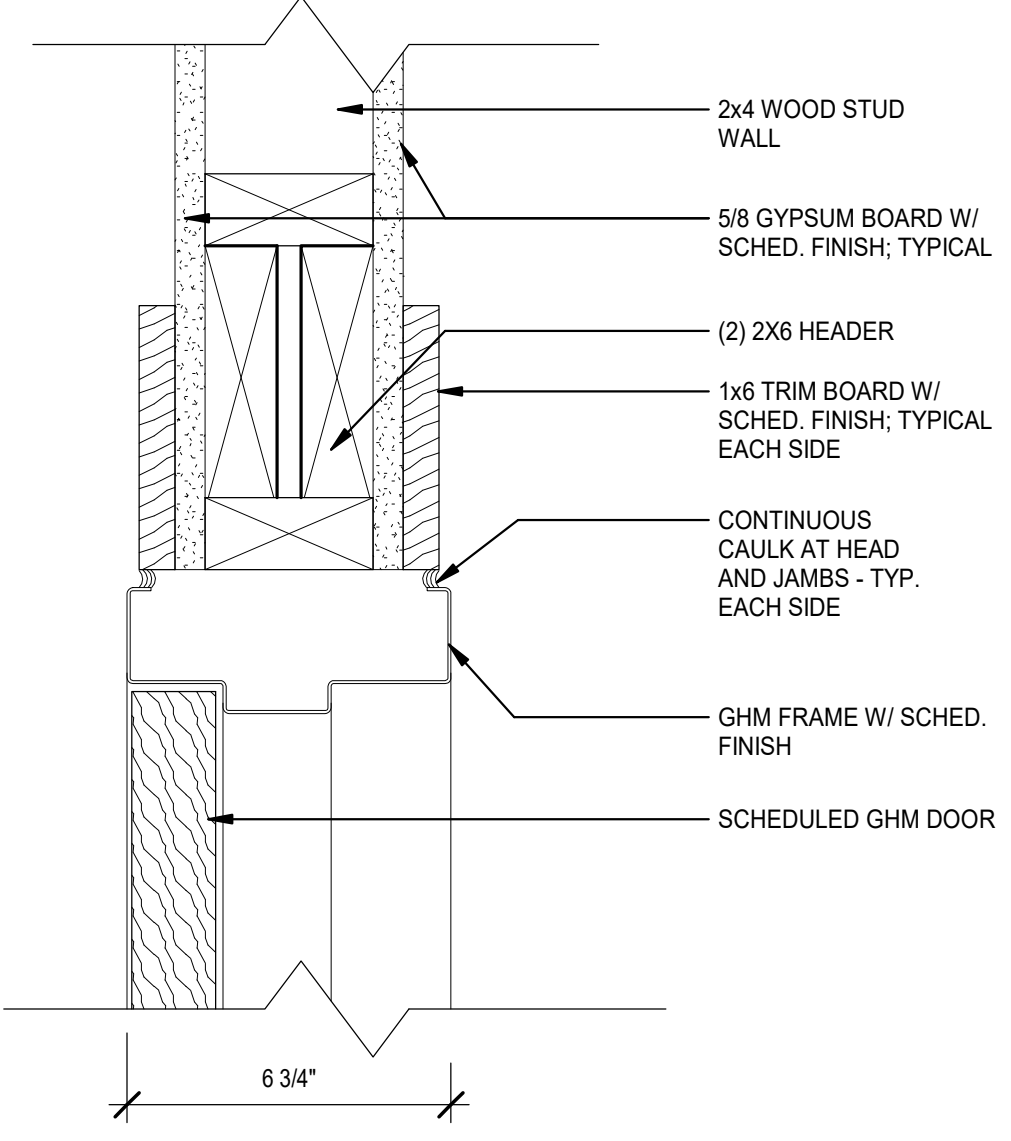
ROLL UP SERVICE COUNTER SHUTTER



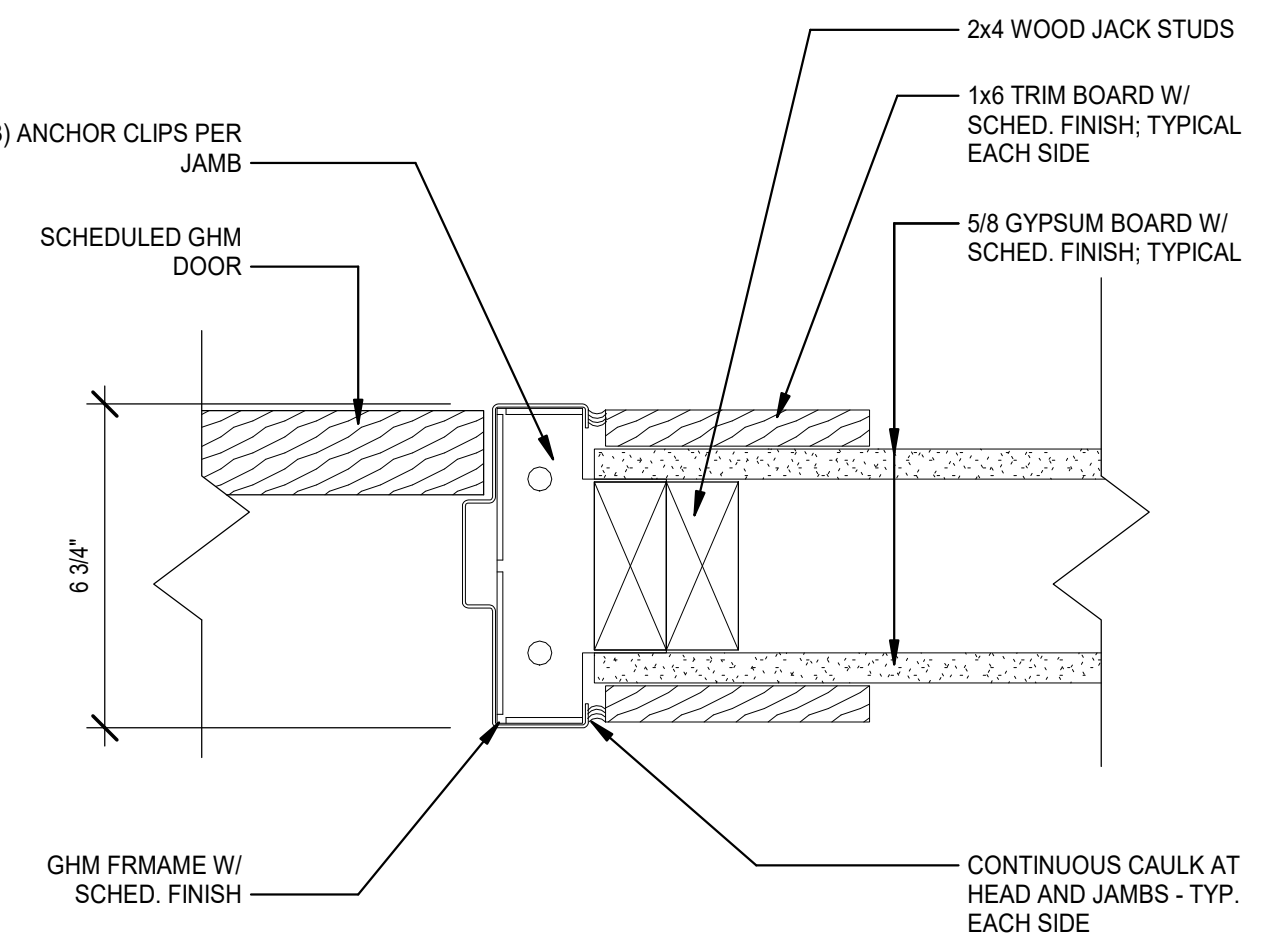
EE_FIXED ALUMINUM STOREFRONT TYPE S1
SCALE: 3/8" = 1'-0"



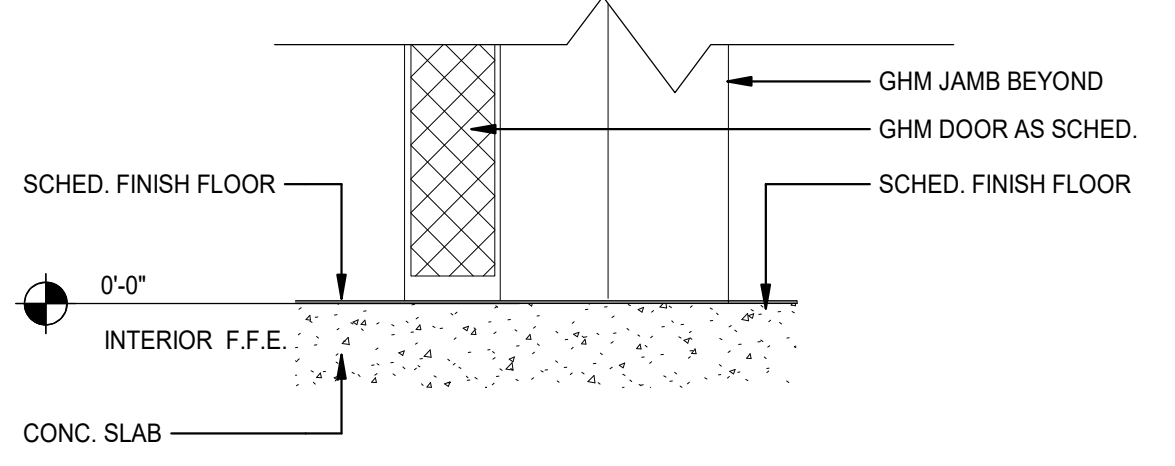
LOUVER
SCALE: 3/8" = 1'-0"



1 A5.1 TYPICAL INTERIOR DOOR HEAD DETAIL
Scale: 3" = 1'-0"

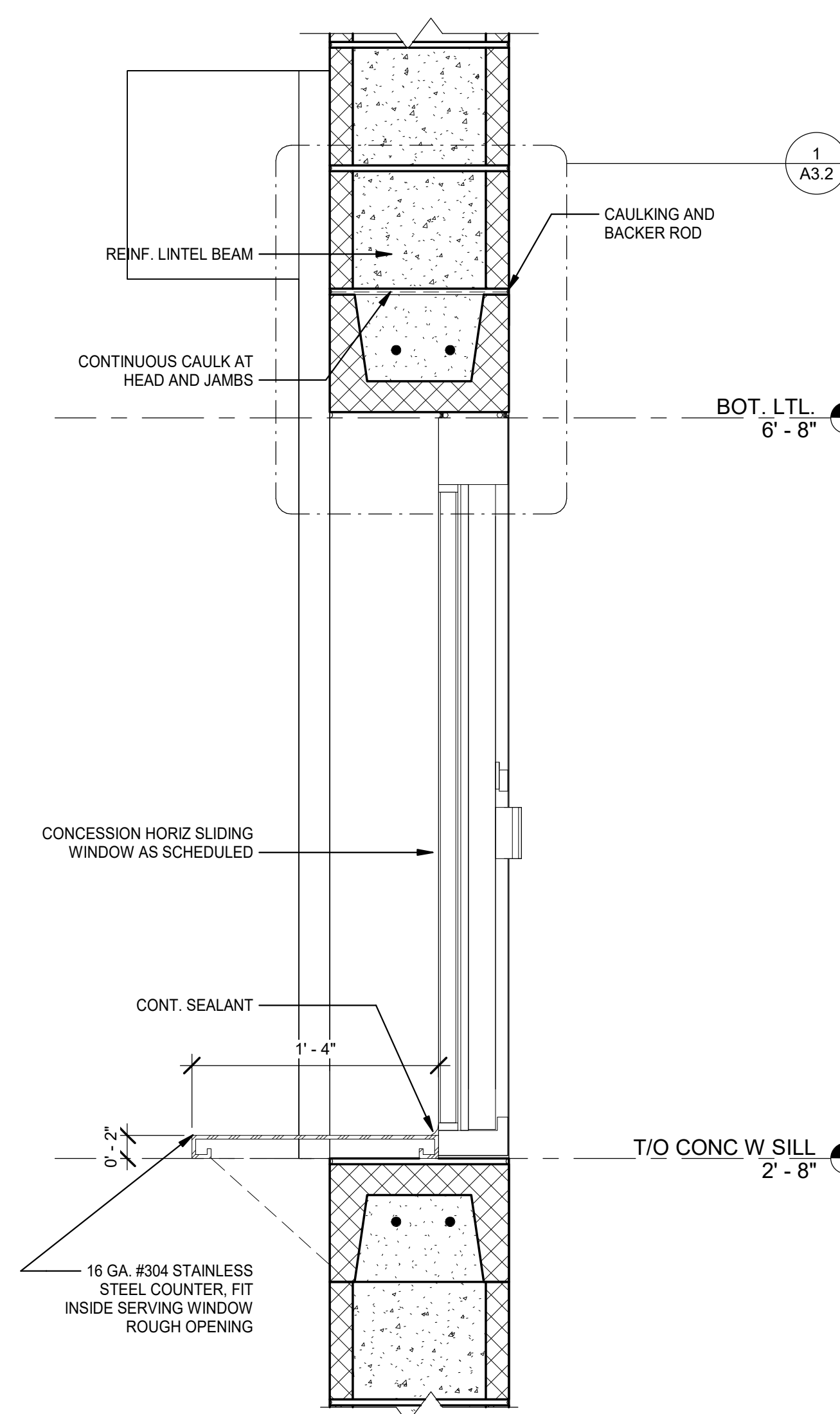


2 A5.1 TYPICAL INTERIOR DOOR JAMB DETAIL
Scale: 3" = 1'-0"

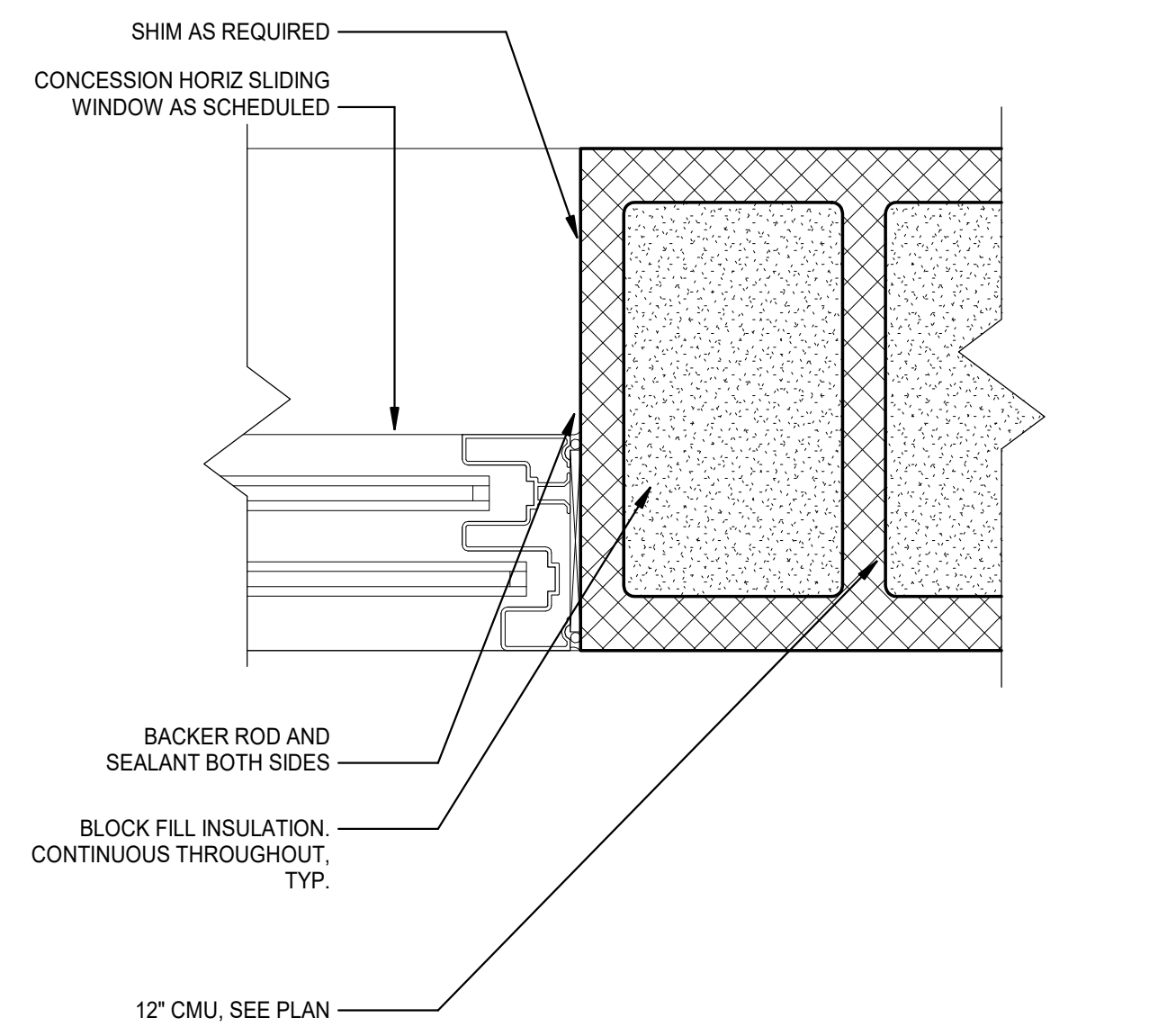


3 A5.1 SILL DETAIL AT INTERIOR DOORS
Scale: 3" = 1'-0"

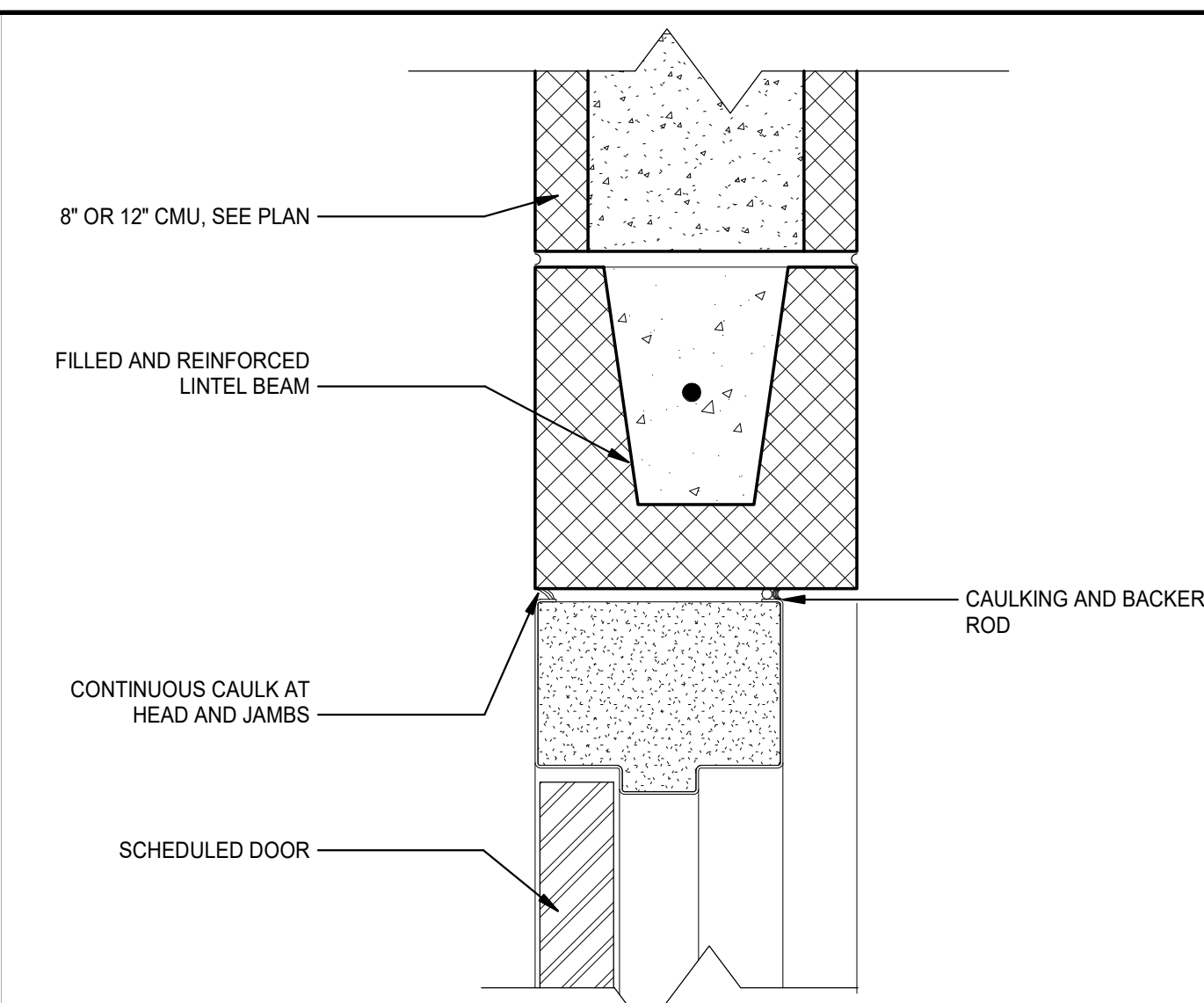




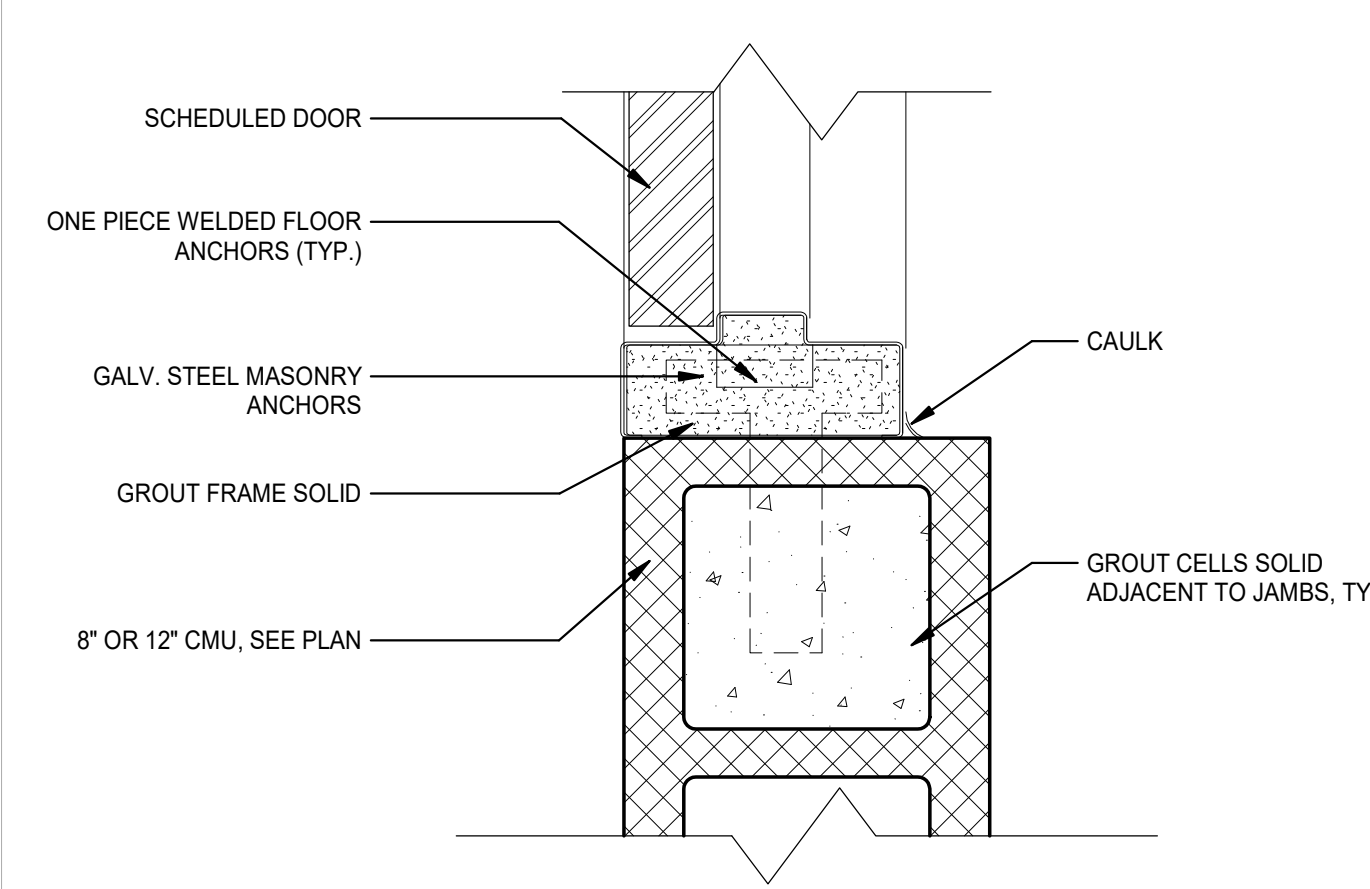
1
A5.2
CONCESSION WINDOW DETAIL
Scale: 1 1/2" = 1'-0"
6" 3" 0" 6" 1'



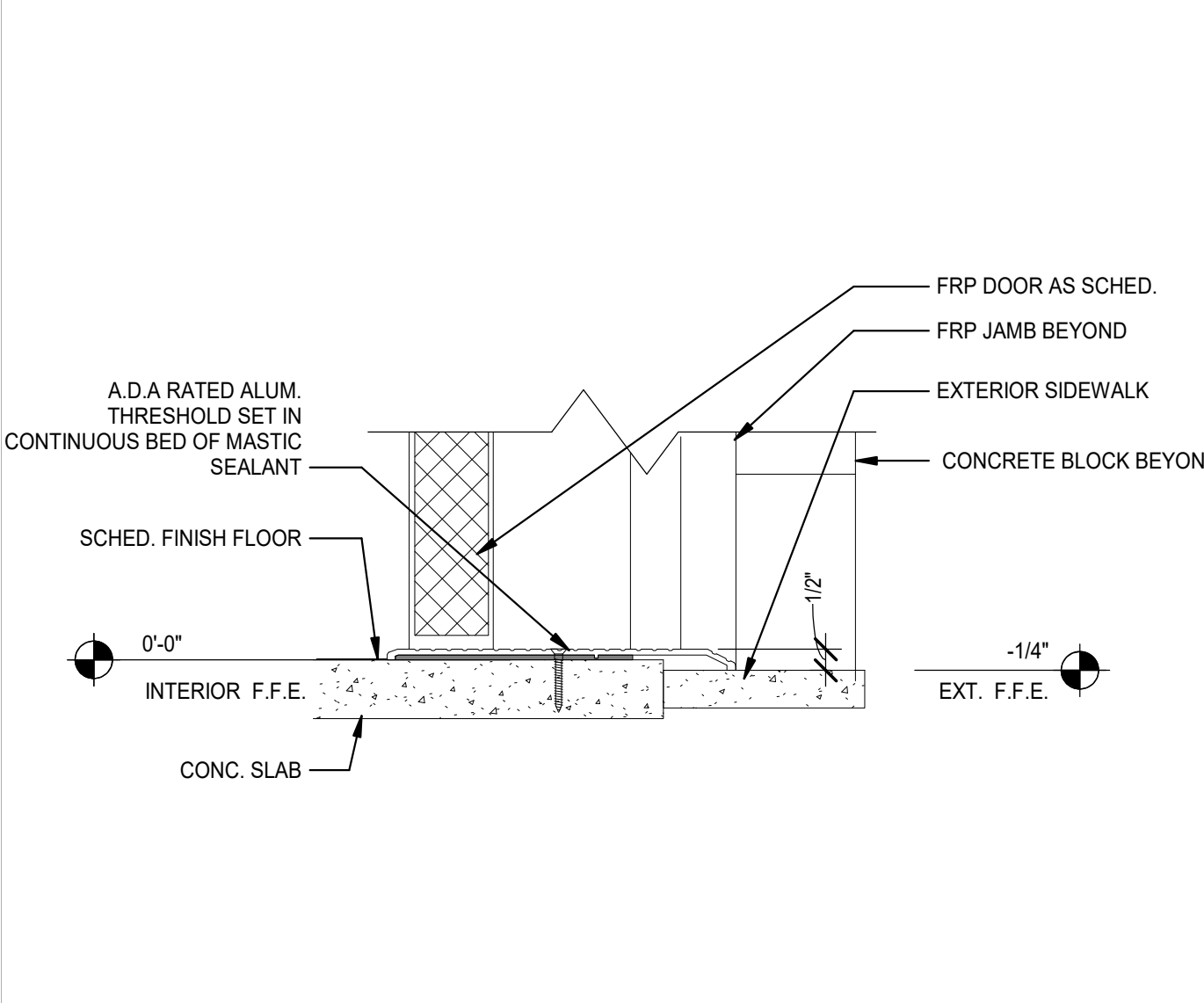
2
A5.2
CONCESSION WINDOW JAMB DETAIL
Scale: 3" = 1'-0"
4" 2" 0" 4" 8"



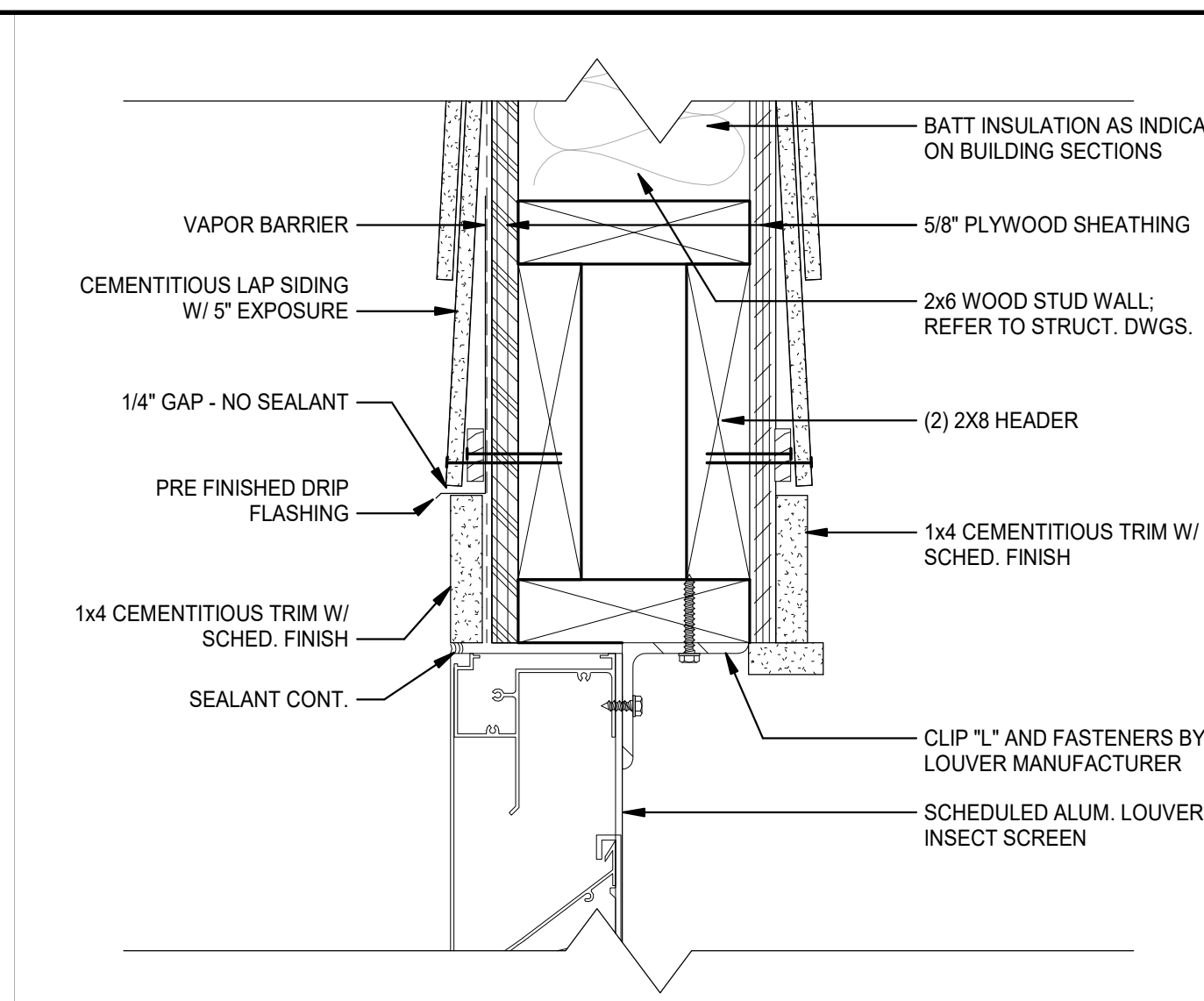
3
A5.2
DOOR HEAD DETAIL
Scale: 3" = 1'-0"
4" 2" 0" 4" 8"



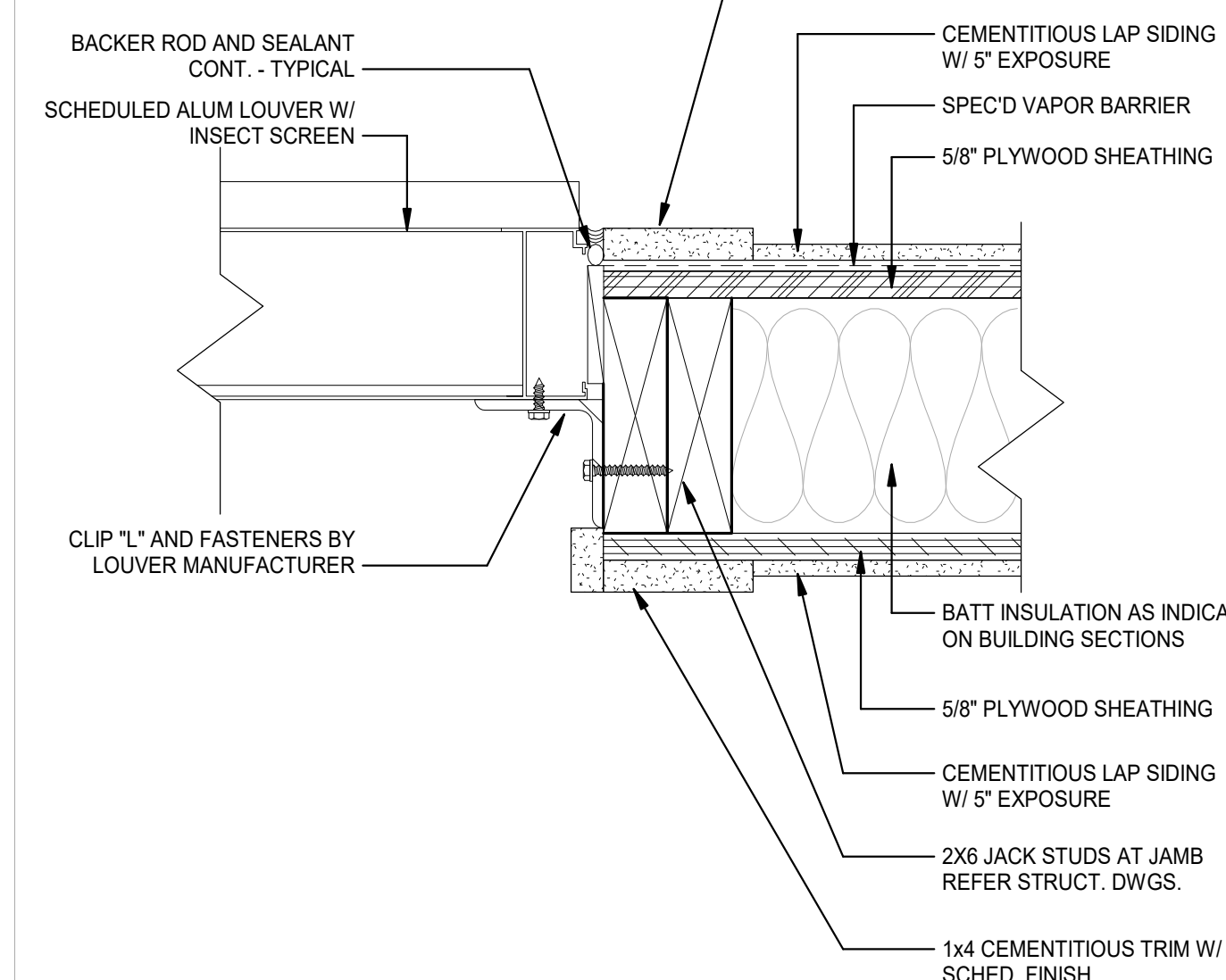
4
A5.2
DOOR JAMB DETAIL
Scale: 3" = 1'-0"
4" 2" 0" 4" 8"



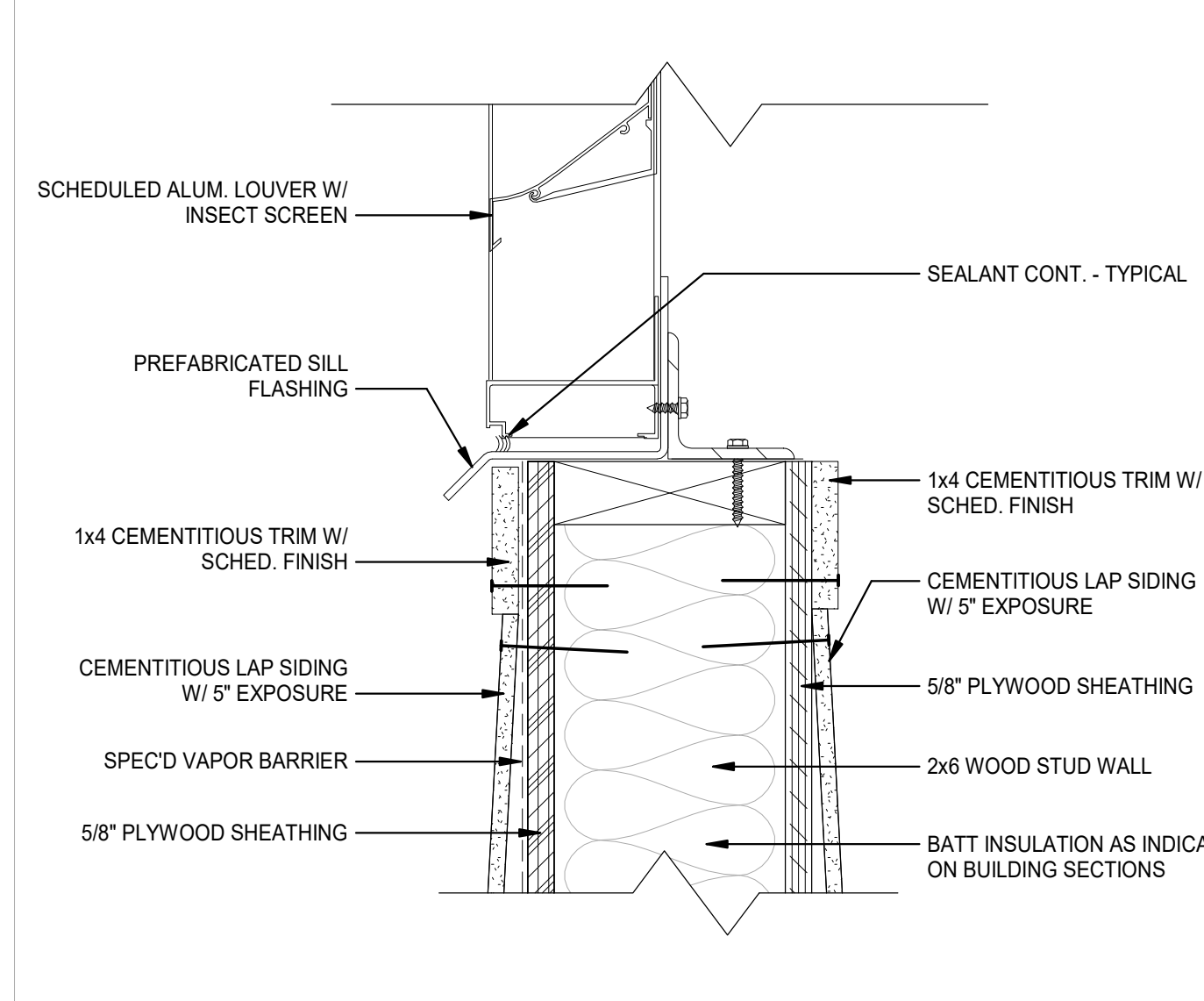
5
A5.2
SILL DETAIL AT EXTERIOR DOORS
Scale: 3" = 1'-0"
4" 2" 0" 4" 8"



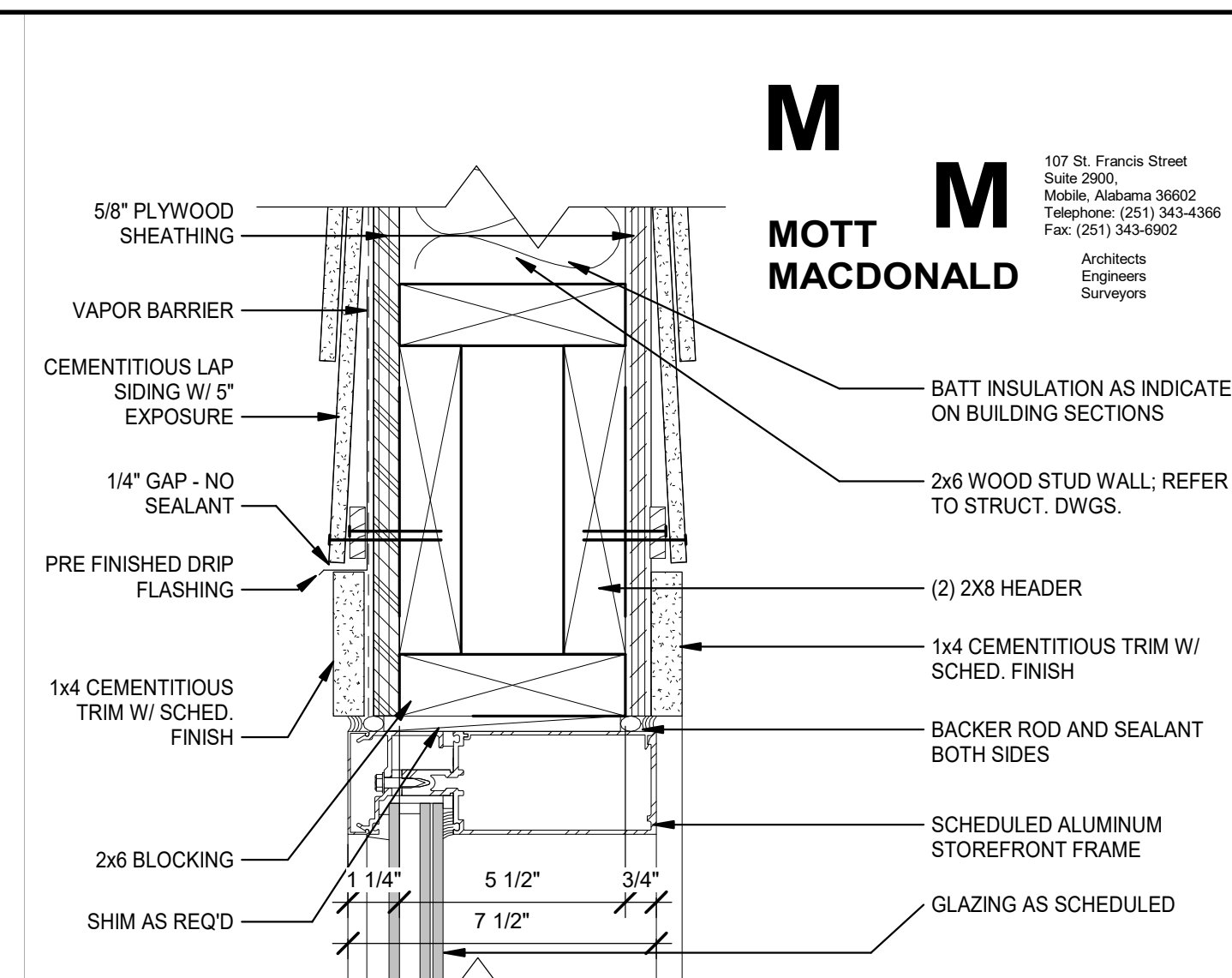
6
A5.2
TYPICAL LOUVER HEAD DETAIL
Scale: 3" = 1'-0"
4" 2" 0" 4" 8"



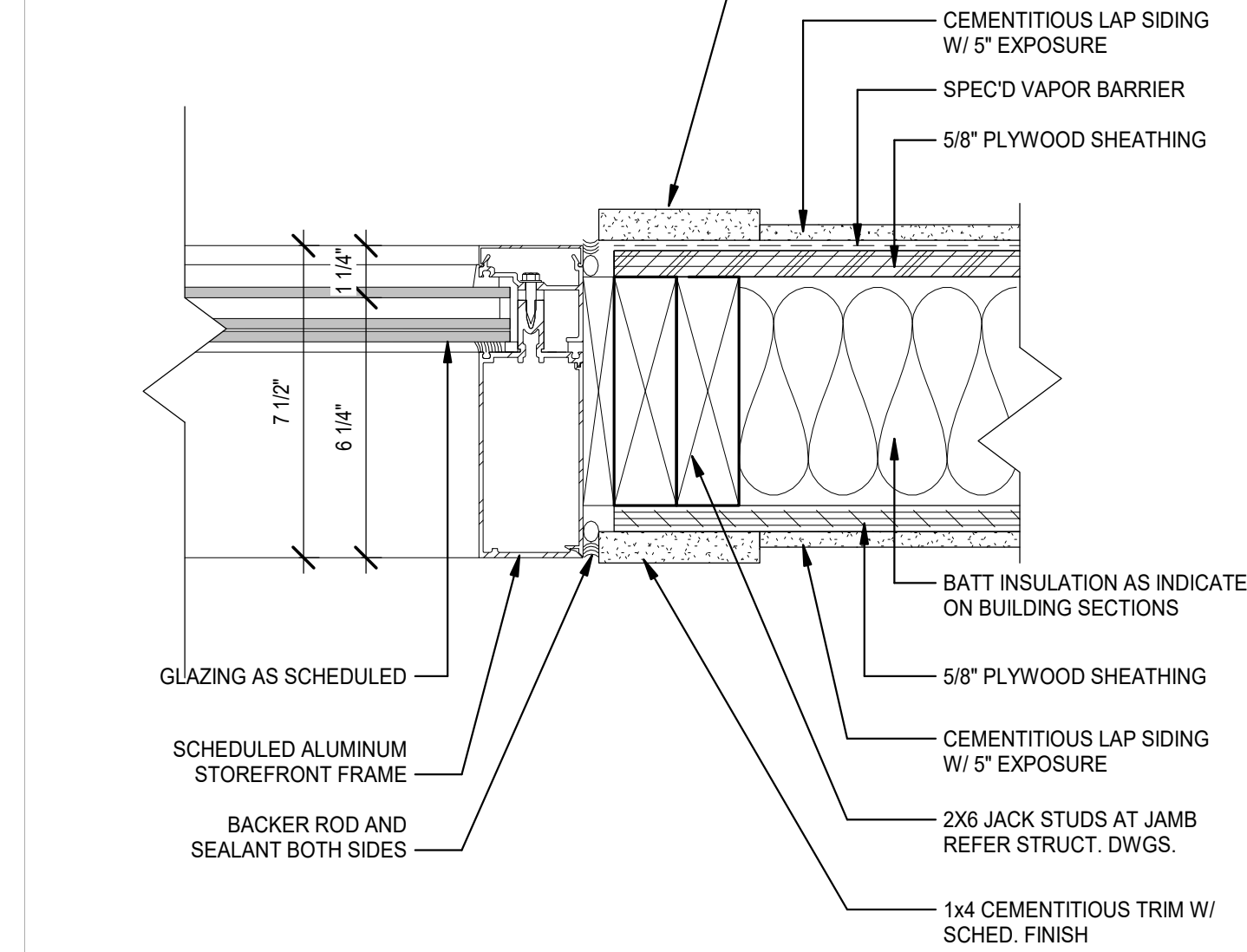
7
A5.2
TYPICAL LOUVER JAMB DETAIL
Scale: 3" = 1'-0"
4" 2" 0" 4" 8"



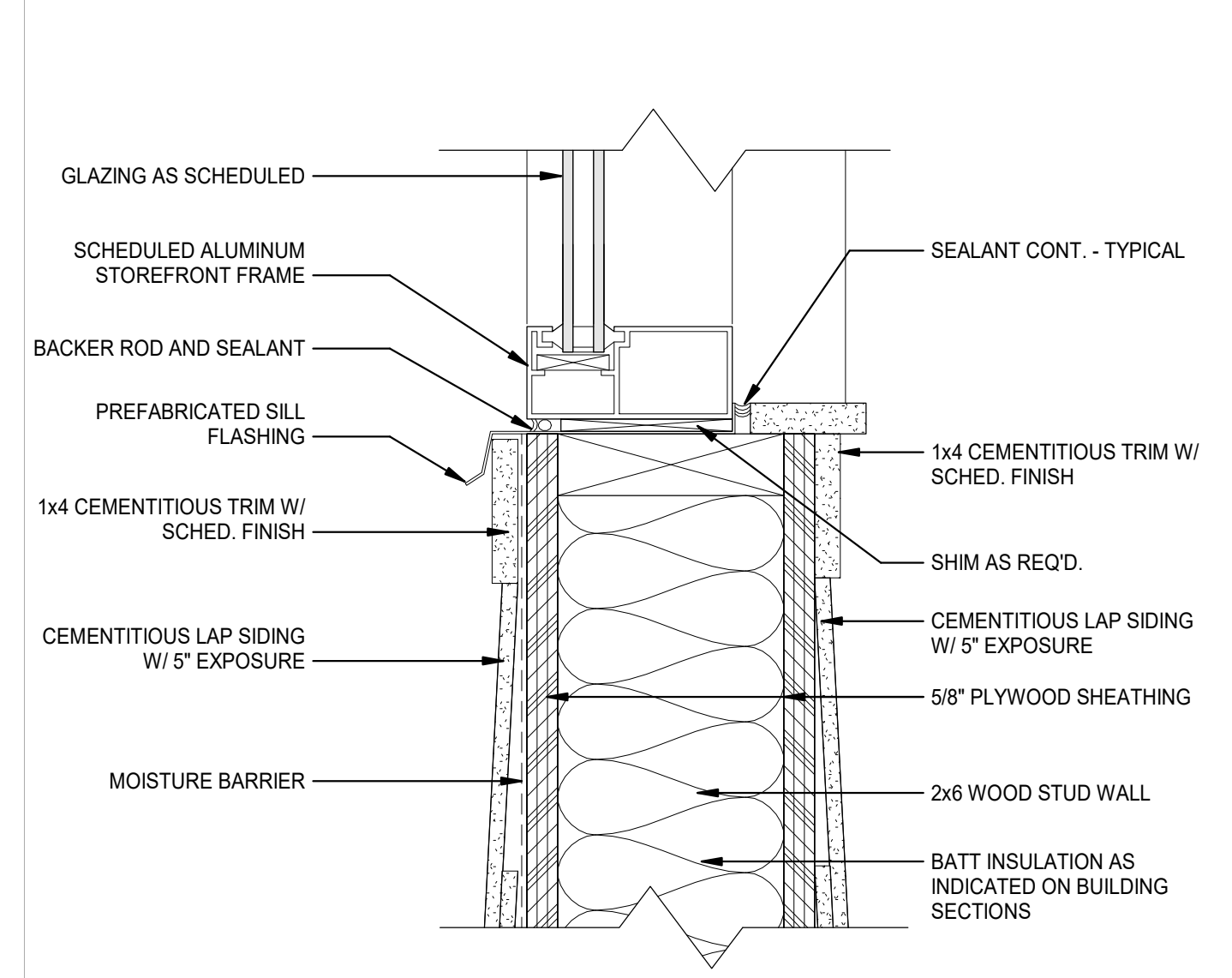
8
A5.2
TYPICAL LOUVER SILL
Scale: 3" = 1'-0"
4" 2" 0" 4" 8"



9
A5.2
EXTERIOR STOREFRONT HEAD
Scale: 3" = 1'-0"
4" 2" 0" 4" 8"



10
A5.2
EXTERIOR STOREFRONT JAMB AT WALL
Scale: 3" = 1'-0"
4" 2" 0" 4" 8"



11
A5.2
WINDOW SILL DETAIL
Scale: 3" = 1'-0"
2' 1' 0" 2' 4"

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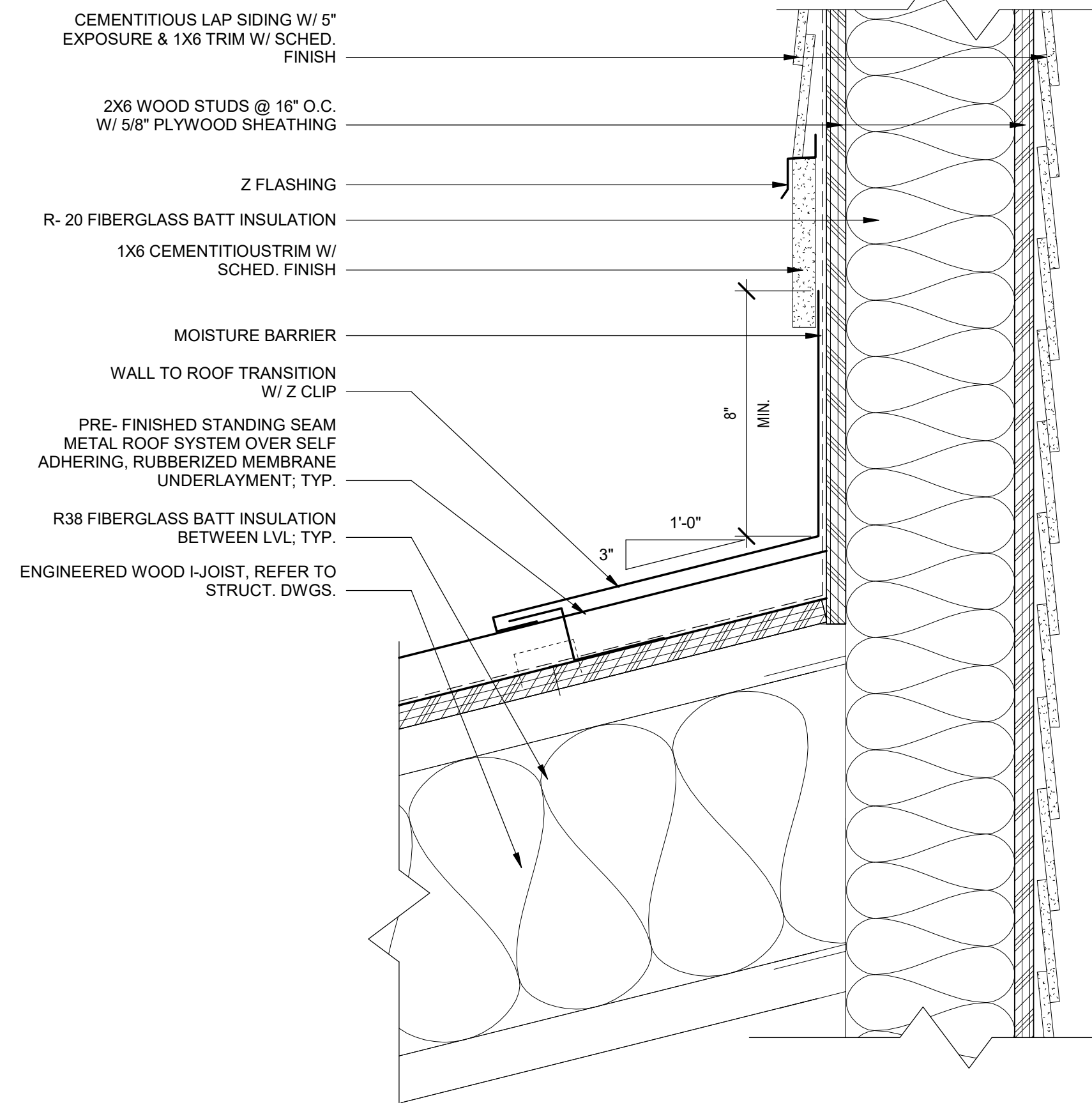
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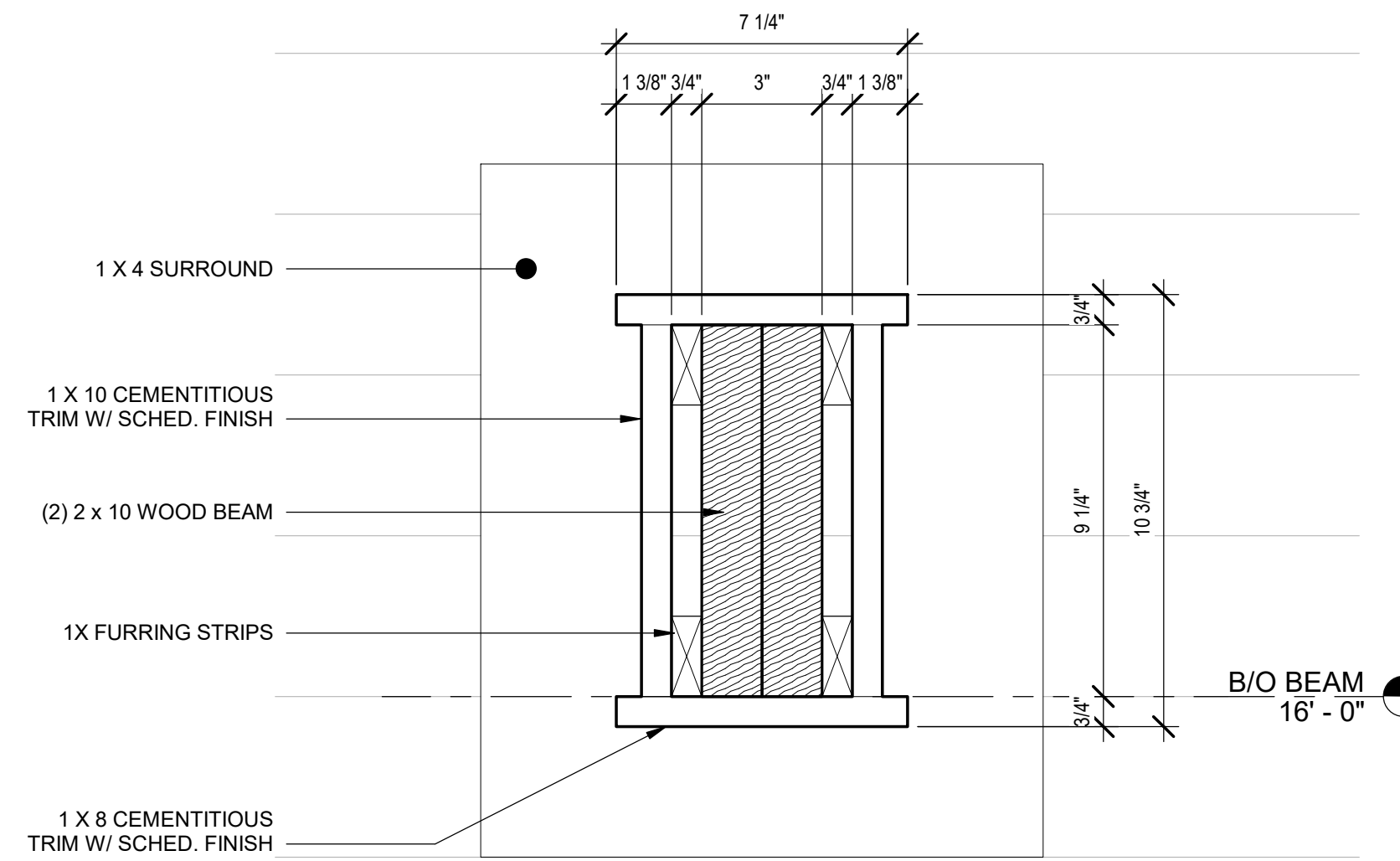
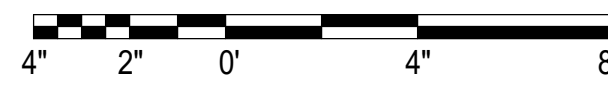


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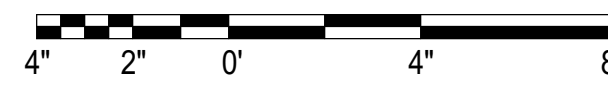
A5.2



1 WALL TO ROOF DETAIL
A6.1 Scale: 3" = 1'-0"

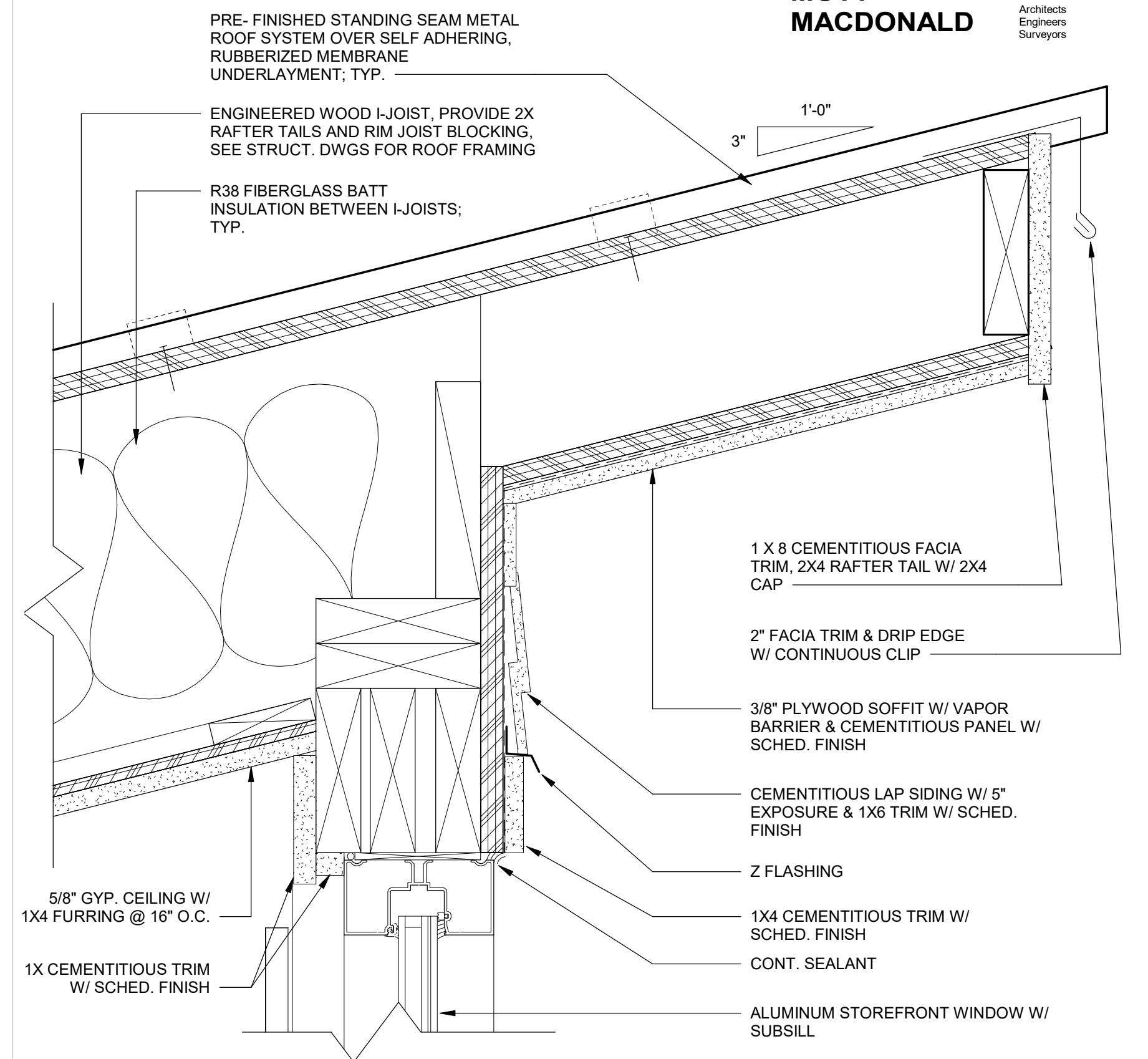


3 BEAM DETAIL
A6.1 Scale: 3" = 1'-0"

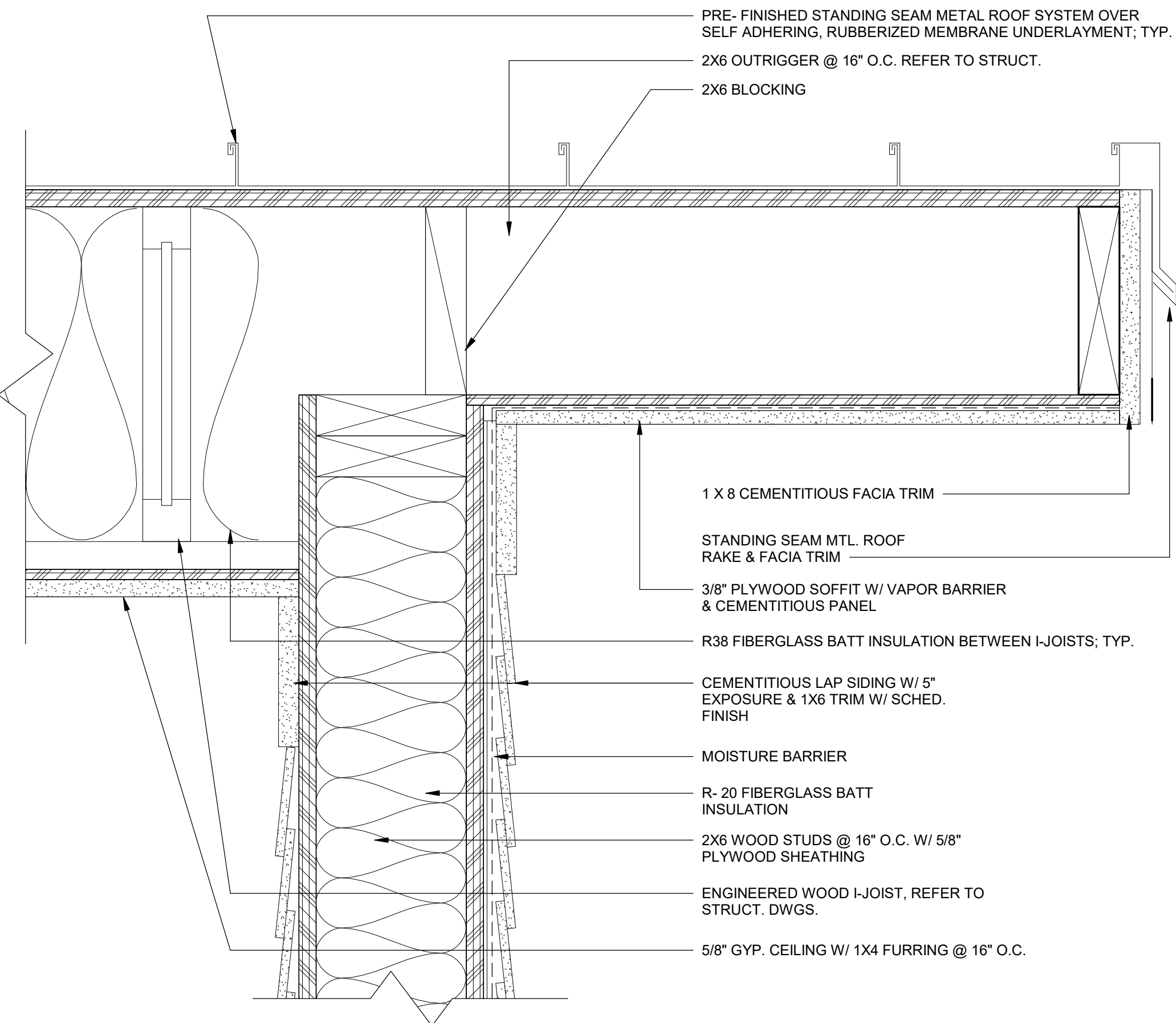


- NOTES:
1. SEE STRUCT. FOR ALL CLIPS & STRAPS FOR FRAMING
 2. ALL FLASHING AND TRIM TO MATCH PBU PANEL FINISH
 3. ALL SIDING TO BE SMOOTH FACE

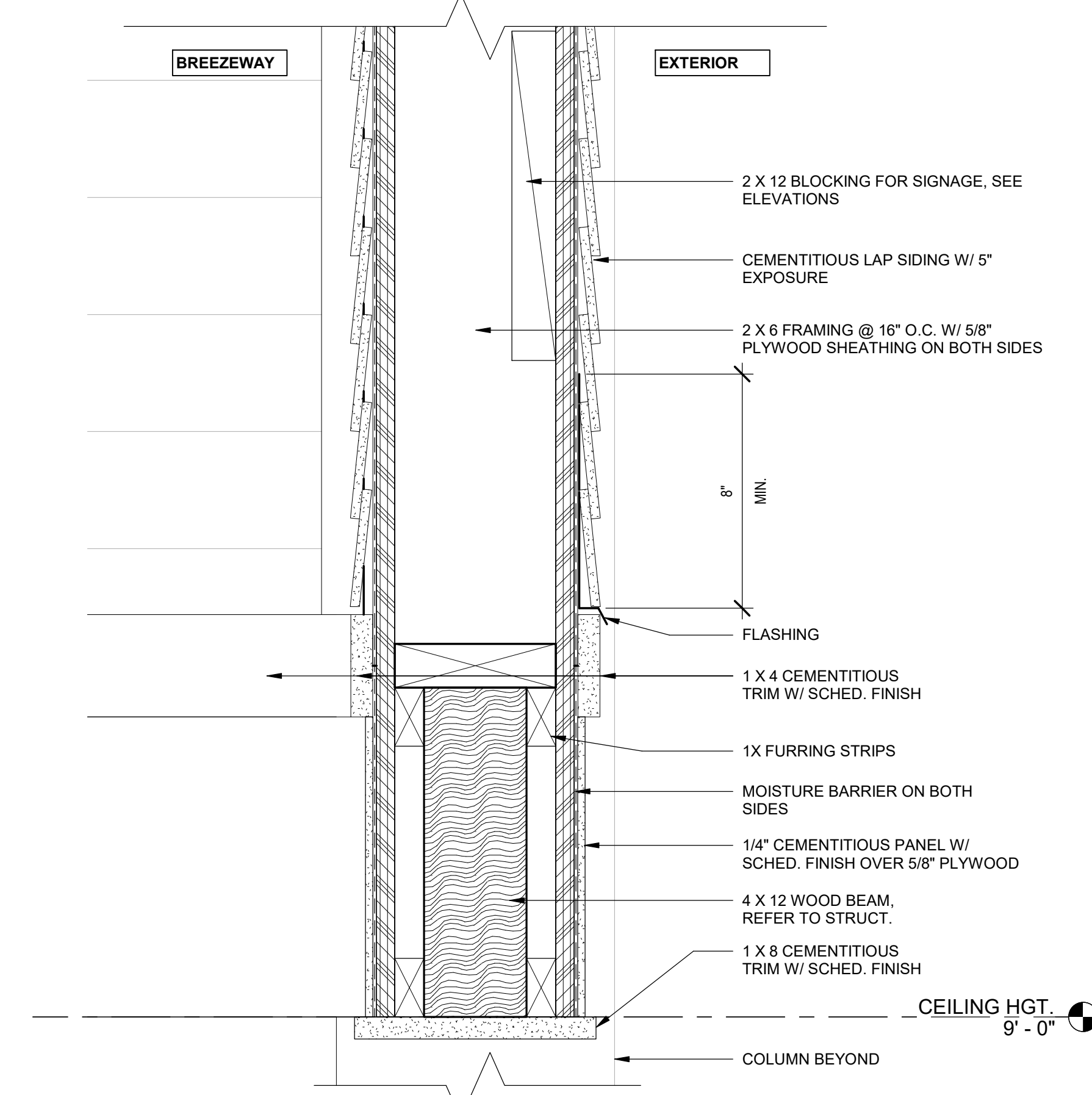
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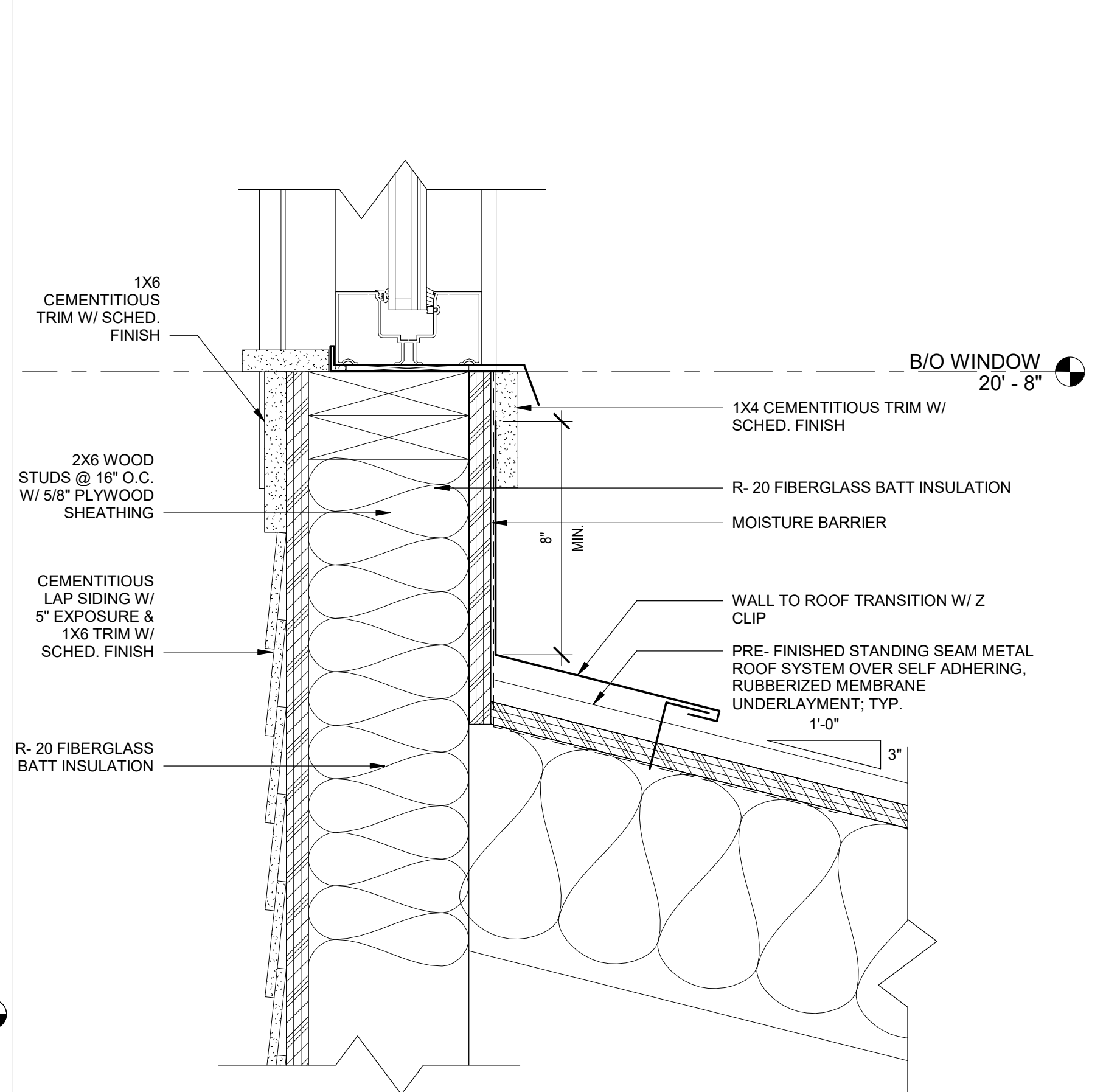
5 ROOF DETAIL @ BREEZWAY
A6.1 Scale: 3" = 1'-0"



2 ROOF RAKE DETAIL @ BREEZWAY
A6.1 Scale: 3" = 1'-0"

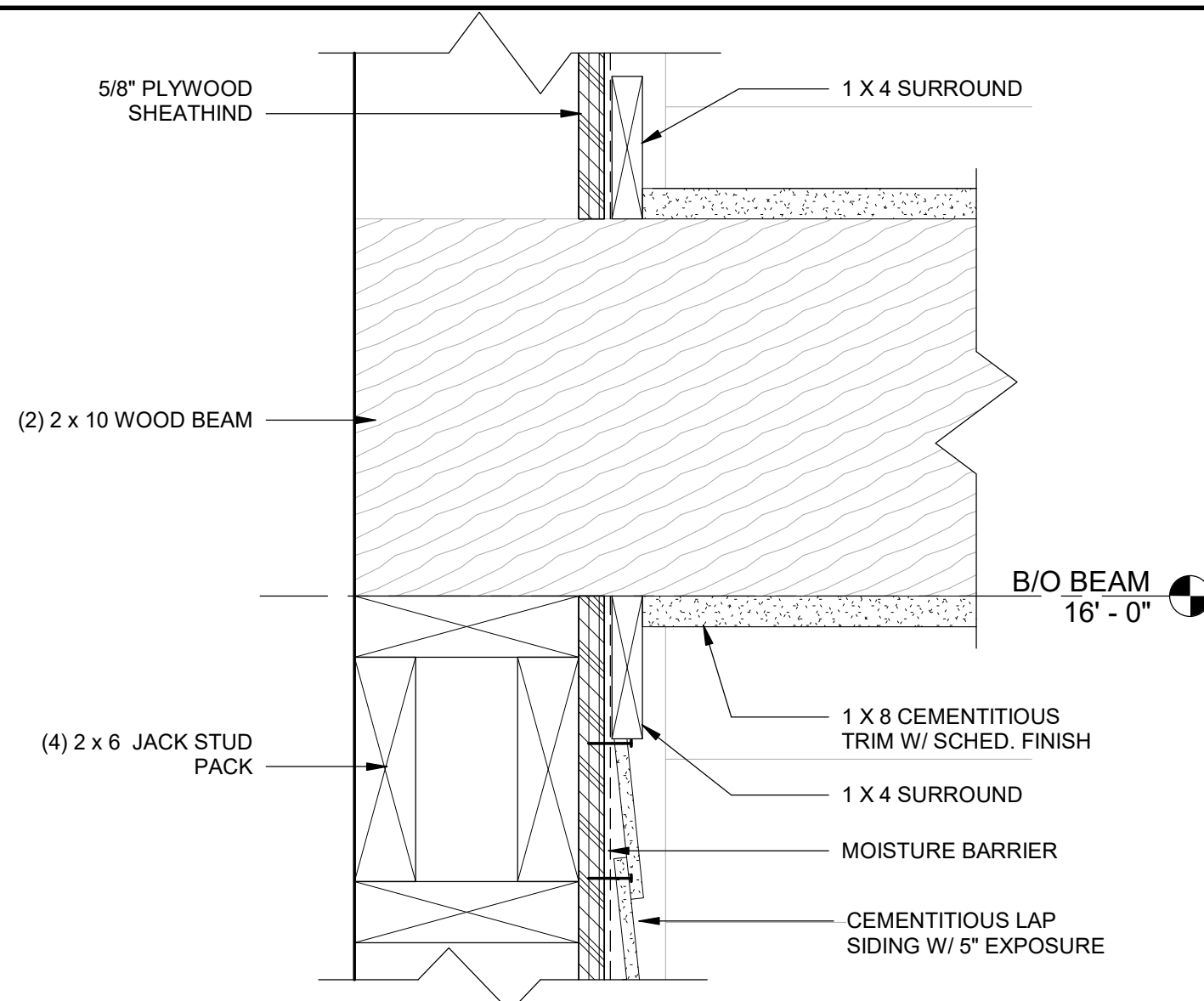


4 SIDING WALL @ BEAM DETAIL
A6.1 Scale: 3" = 1'-0"



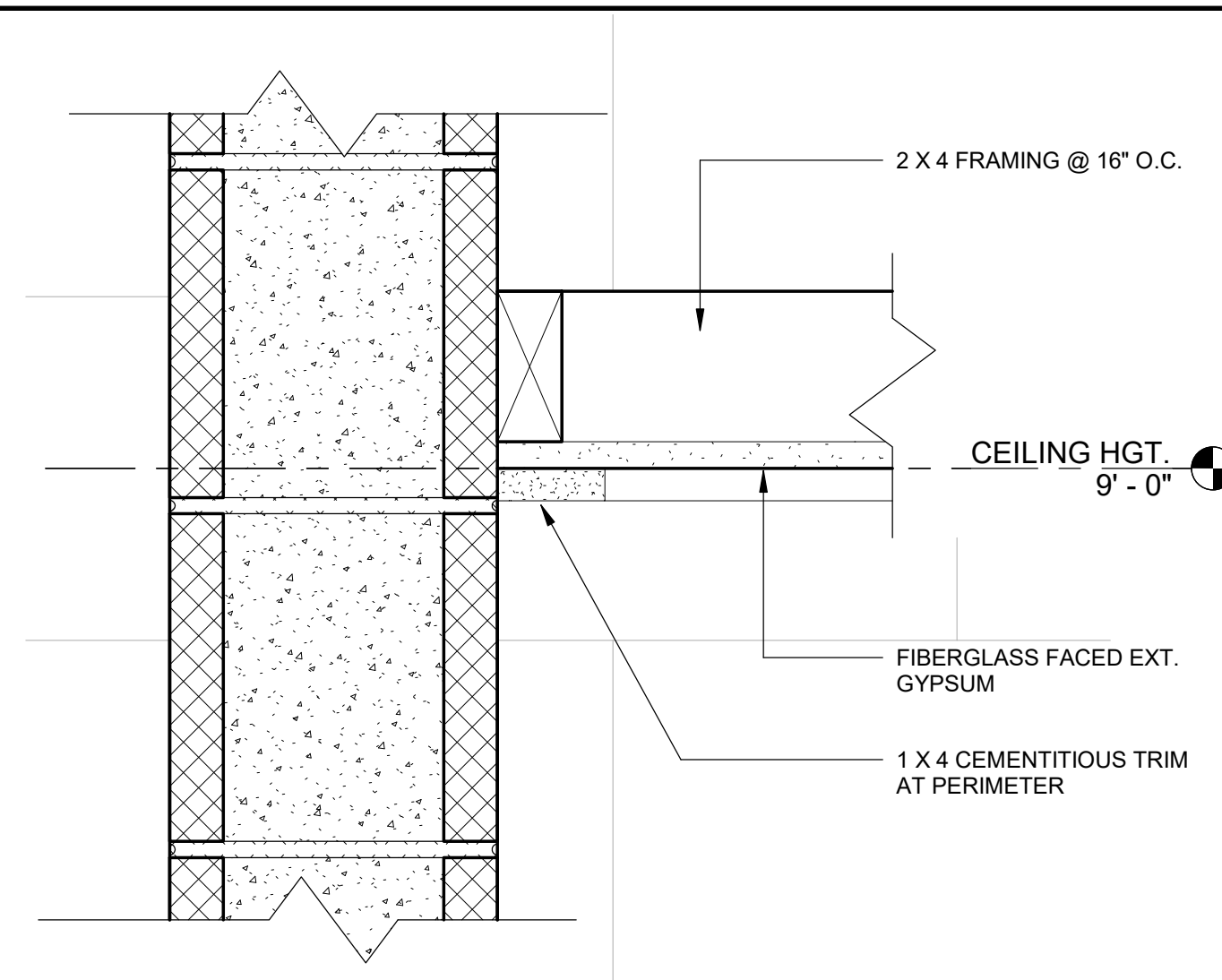
5 ROOF DETAIL @ BREEZWAY
A6.1 Scale: 3" = 1'-0"





1 BEAM TO WALL DETAIL

Scale: 3" = 1'-0" 4" 2" 0" 4" 8"



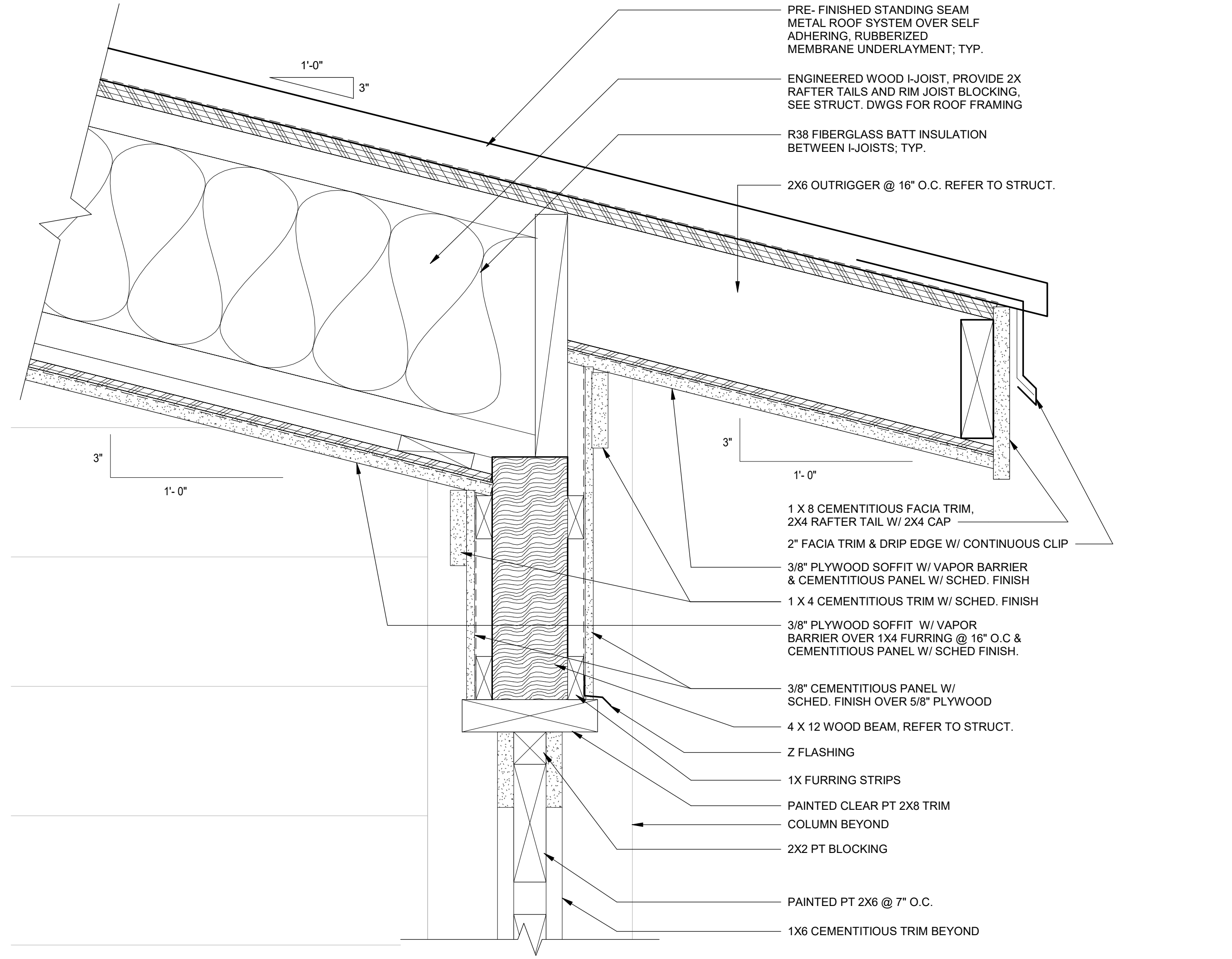
3 CEILING @ CMU DETAIL

Scale: 3" = 1'-0" 4" 2" 0" 4" 8"

NOTES:
 1. SEE STRUCT. FOR ALL CLIPS & STRAPS FOR FRAMING
 2. ALL FLASHING AND TRIM TO MATCH PBU PANEL FINISH
 3. ALL SIDING TO BE SMOOTH FACE

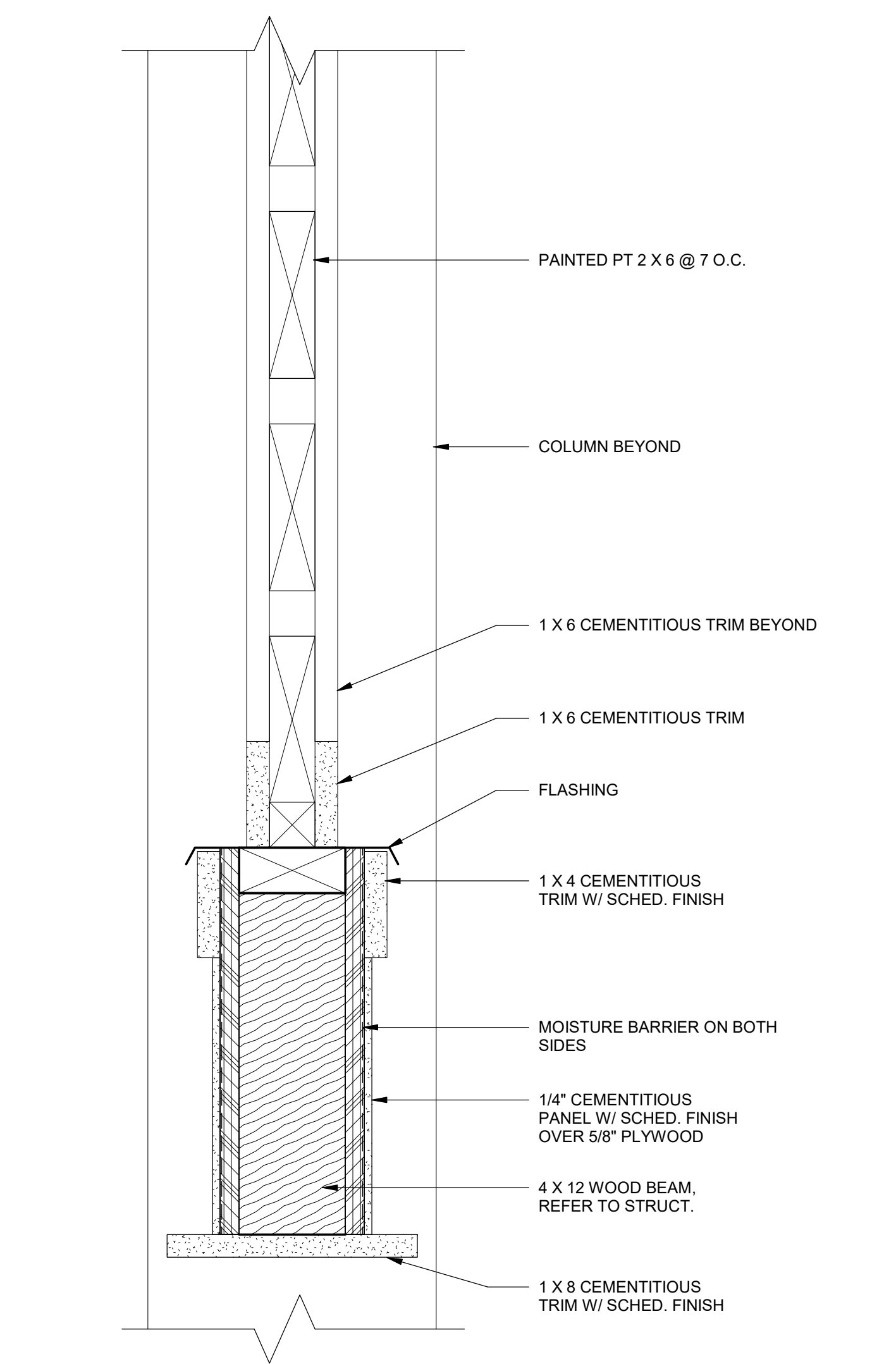
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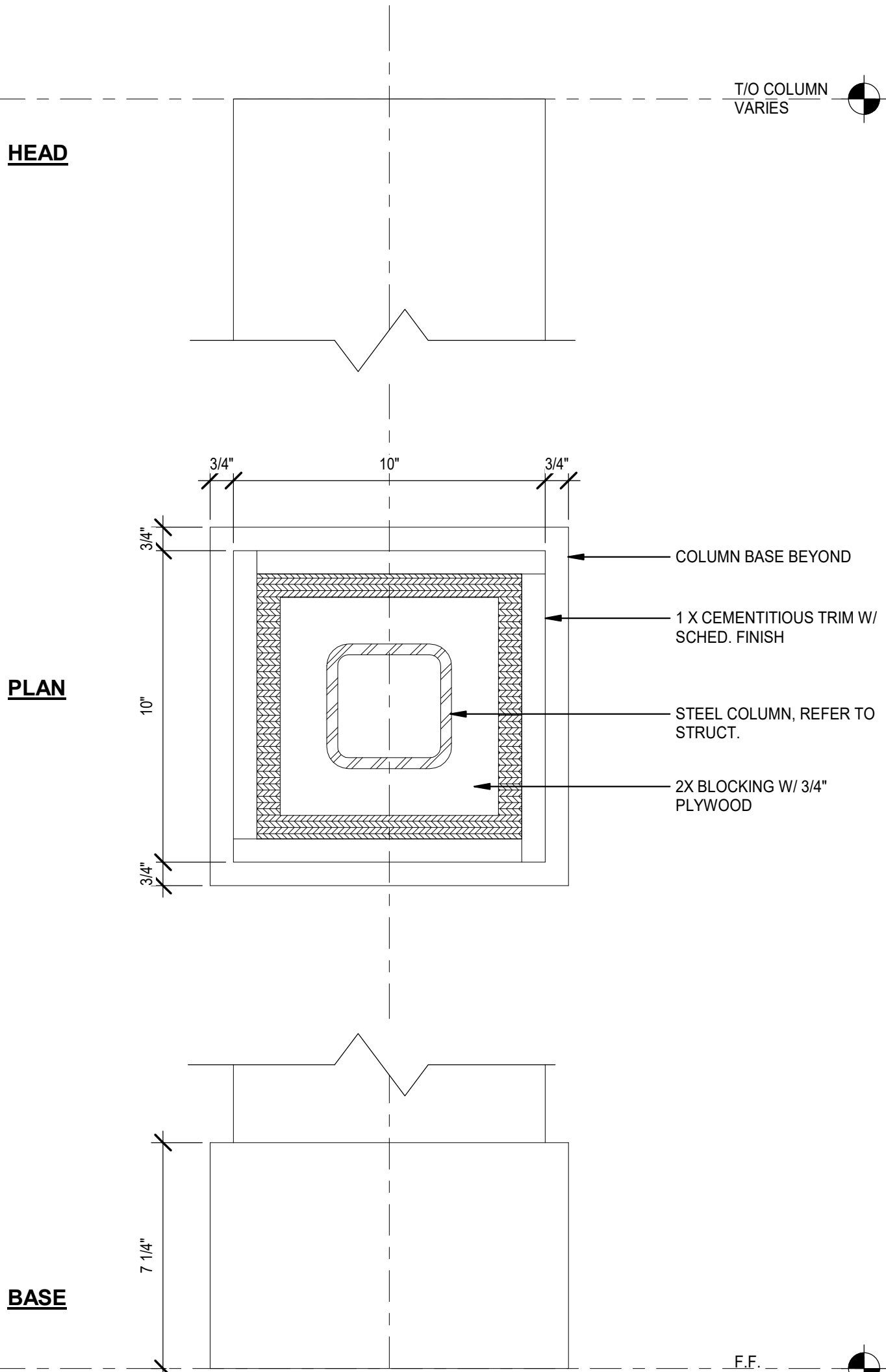
5 WALL TO ROOF DETAIL @ COVERED OUTDOOR

Scale: 3" = 1'-0" 4" 2" 0" 4" 8"



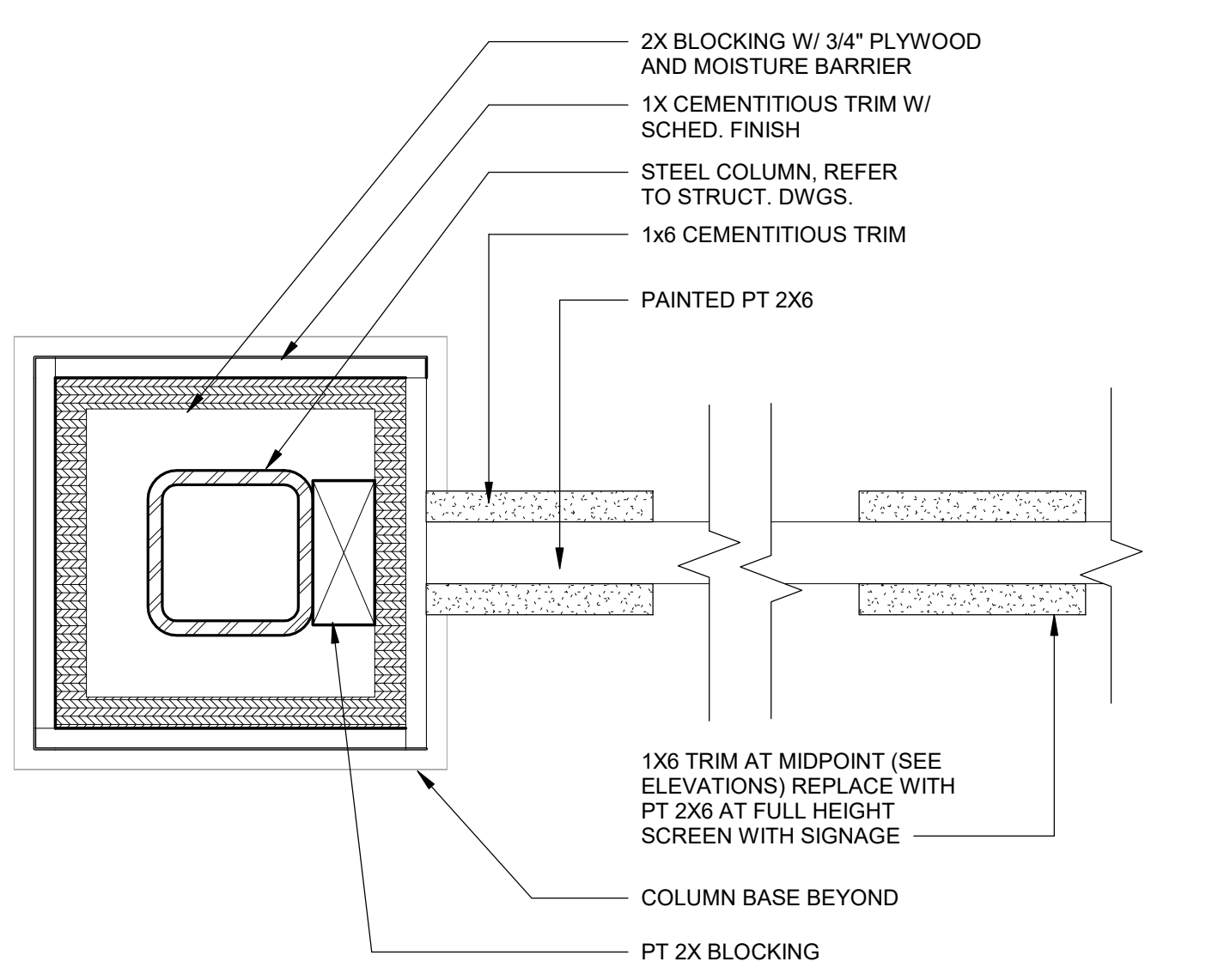
2 SCREEN DETAIL @ BEAM DETAIL

Scale: 3" = 1'-0" 4" 2" 0" 4" 8"



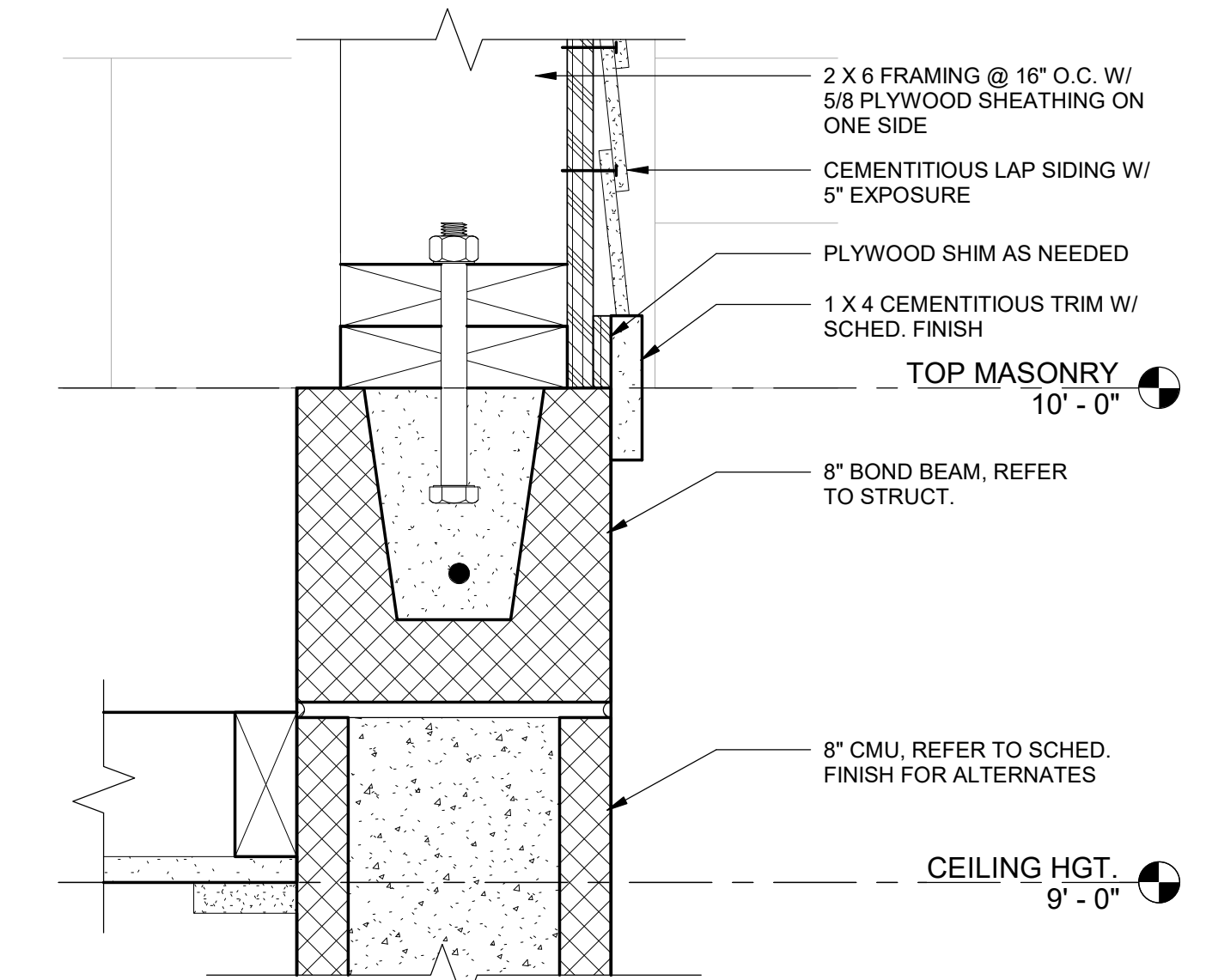
4 COLUMN WRAP DETAIL

Scale: 3" = 1'-0" 4" 2" 0" 4" 8"



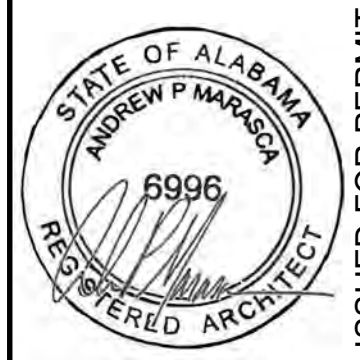
6 SCREEN DETAIL AT COLUMN

Scale: 3" = 1'-0" 4" 2" 0" 4" 8"



7 TRIM @ MASONRY FRAMING TRANSITION

Scale: 3" = 1'-0" 4" 2" 0" 4" 8"



NOTES:
 1. SEE STRUCT. FOR ALL CLIPS & STRAPS FOR FRAMING
 2. ALL FLASHING AND TRIM TO MATCH PBU PANEL FINISH
 3. ALL SIDING TO BE SMOOTH FACE

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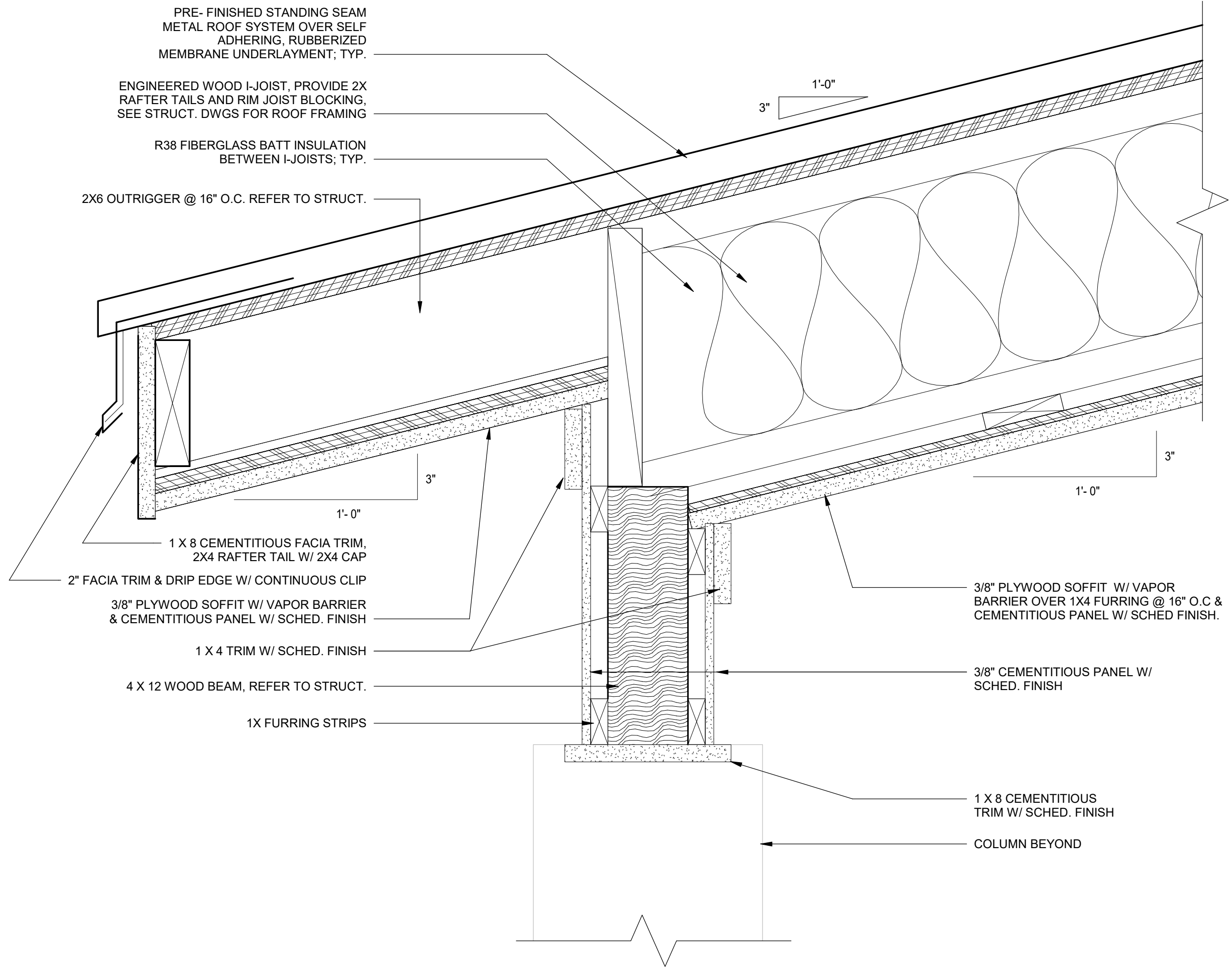
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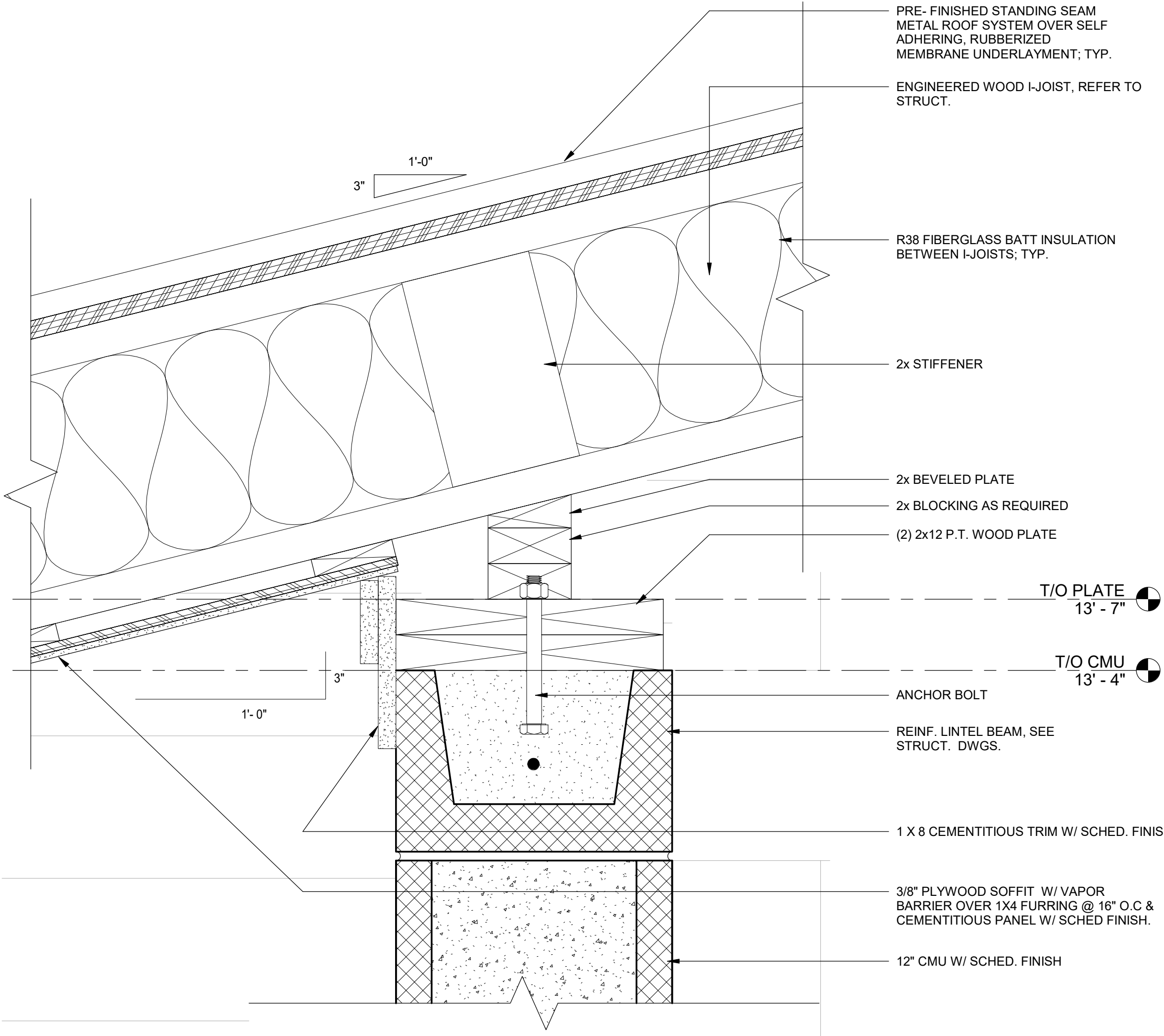
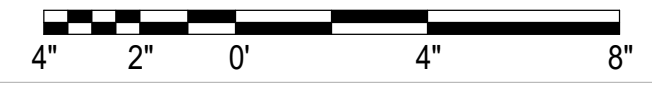


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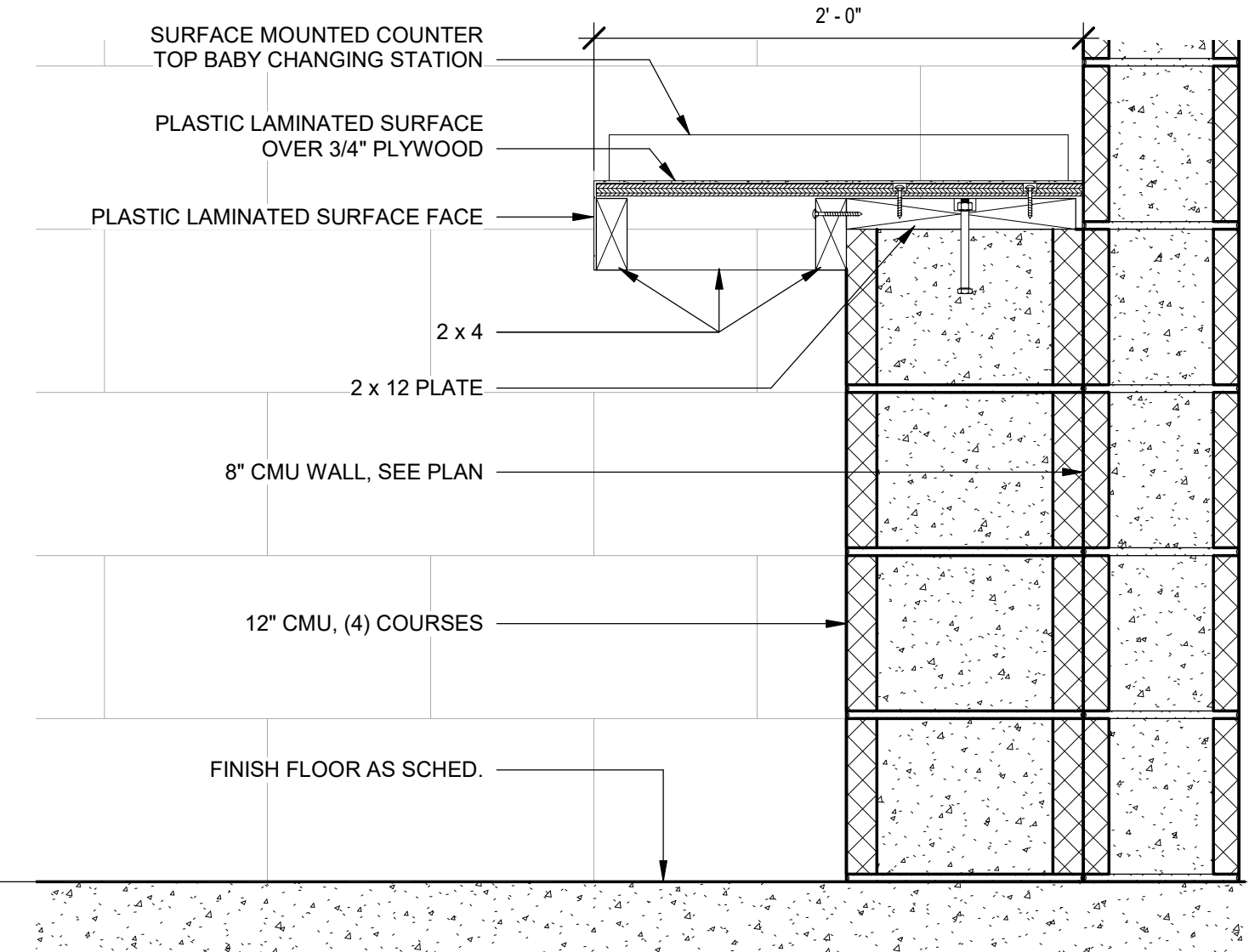
A6.3



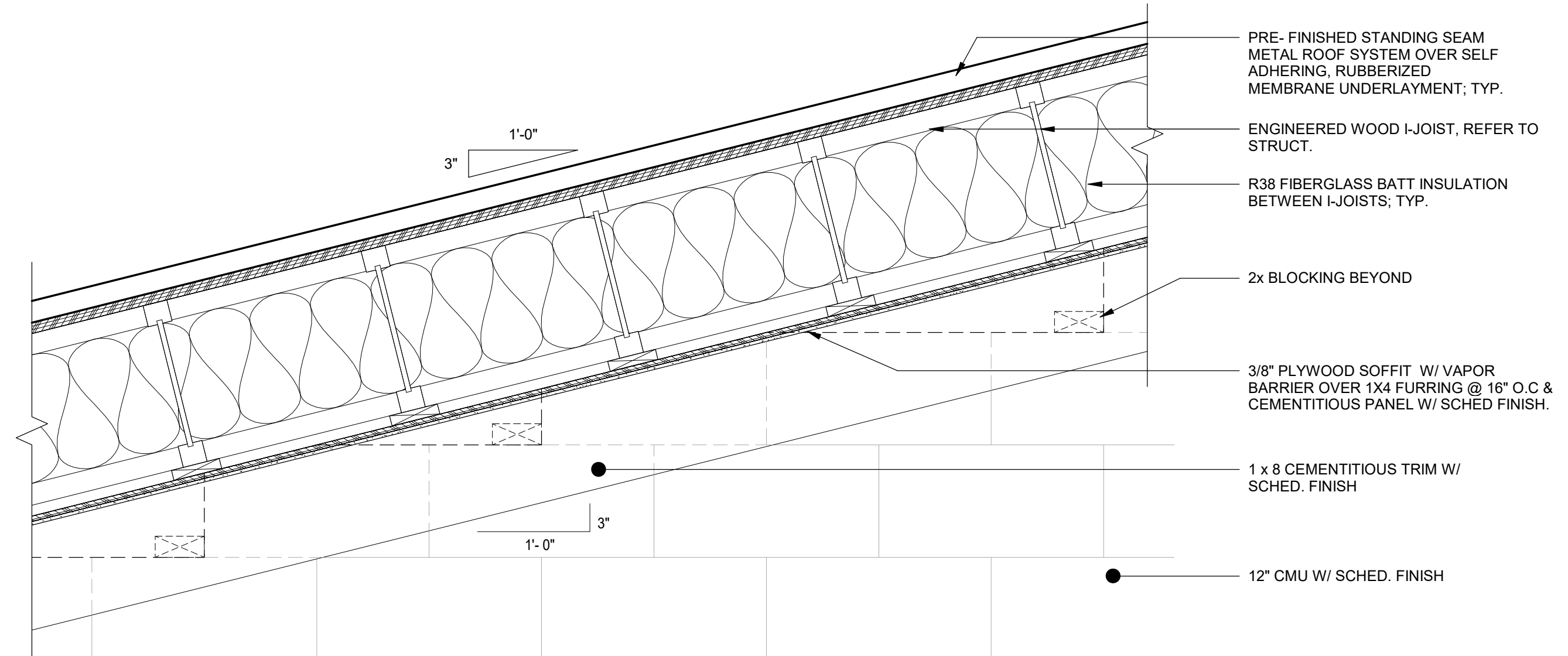
1 ROOF DETAIL @ COLUMN
 A6.3 Scale: 3" = 1'-0"



3 CMU WALL TO ROOF DETAIL
 A6.3 Scale: 3" = 1'-0"



2 BABY CHANGING ATATION SECTION
 A6.3 Scale: 1 1/2" = 1'-0"

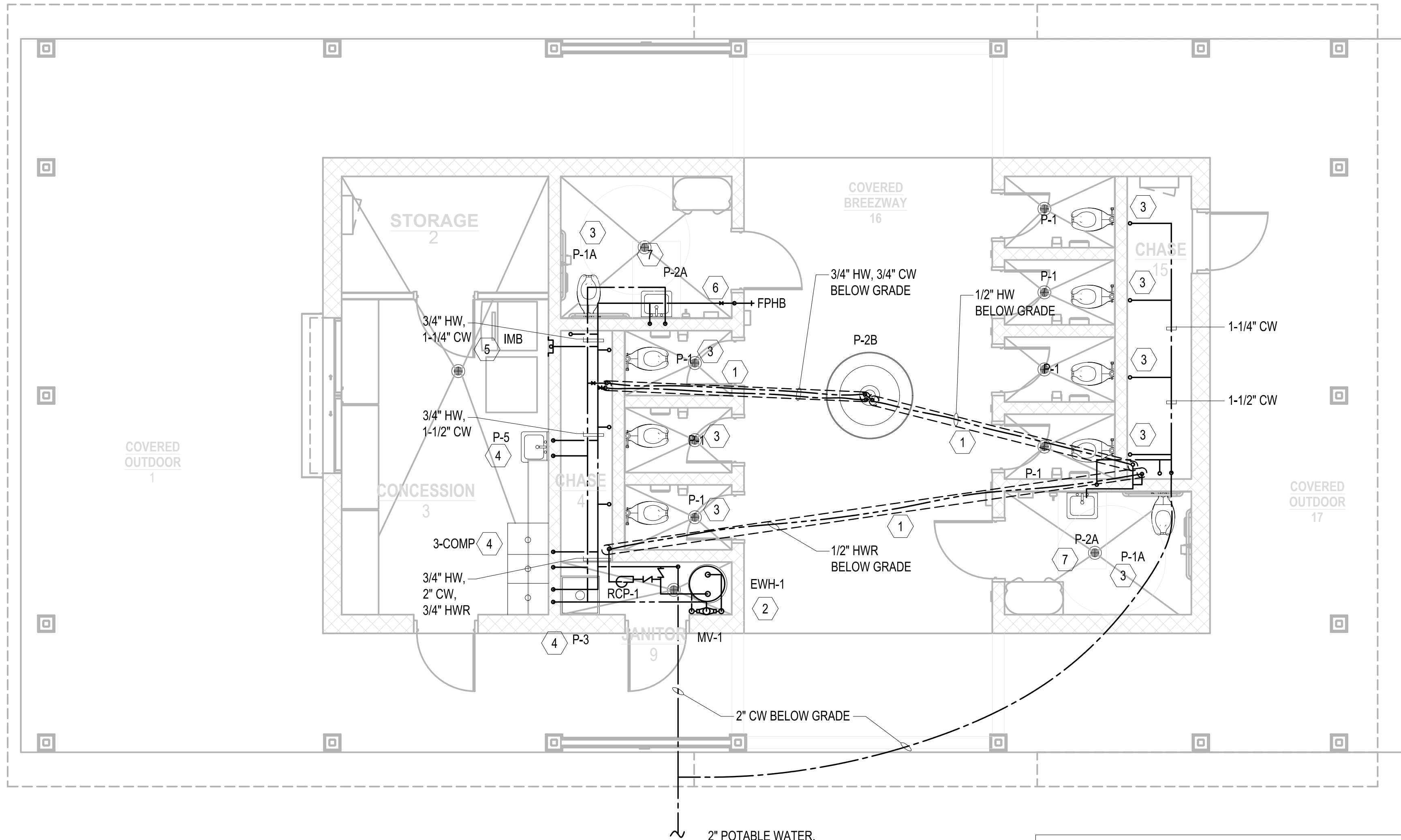


4 TRIM DETAIL @ SOFFIT
 A6.3 Scale: 1 1/2" = 1'-0"



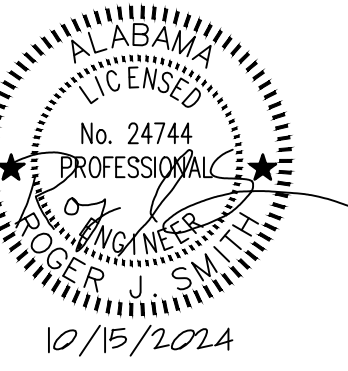
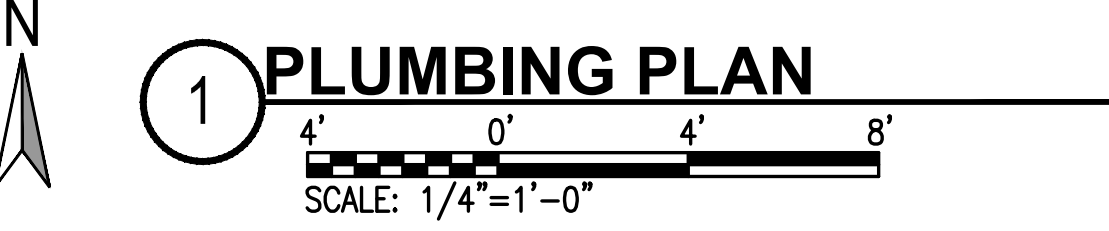
SHEET NOTES

- 1 WATER PIPING INSTALLED BELOW THE SLAB SHALL BE INSTALLED IN A SCHEDULE 40 PVC SLEEVE, MINIMUM 6"Ø. WATER PIPING INSTALLED BELOW THE SLAB IN THE SLEEVE SHALL BE INSULATED WITH 1" THICK INSULATION. PROTECT SLEEVE TO PREVENT WATER INTRUSION AND INSULATION SATURATION. SEAL AROUND OPEN ENDS OF SLEEVES WEATHER PROOF.
- 2 2" CW SERVICE UP INSIDE MECHANICAL ROOM, PROVIDE ISOLATION SHUT OFF VALVE IN RISE 24" AFF.
- 3 1" CW DOWN FOR CONNECTION TO WATER CLOSET.
- 4 1/2" HW/CW DOWN FOR CONNECTION TO SINK.
- 5 1/2" CW DOWN FOR CONNECTION TO ICE MAKER BOX.
- 6 3/4" CW DOWN FOR CONNECTION TO FREEZE PROOF HOSE BIBB. PROVIDE ISOLATION VALVE IN BRANCH ADJACENT TO TURN DOWN.
- 7 1/2" HW/CW/HWR FOR CONNECTION TO LAVATORY.



2" POTABLE WATER. REFERENCE CIVIL PLANS FOR CONTINUATION TO METER AND BACKFLOW PREVENTER.

PIPING SHOWN IN THE PLUMBING CHASES IS FOR CLARITY. IT IS EXPECTED THE PIPING SHALL BE ROUTED ALONG THE INSIDE FACE OF THE PLUMBING CHASE BEHIND THE FIXTURES. PIPING SHALL BE SECURED TO THE WALL WITH UNISTRUT. ALL PIPING ROUTED WITHIN THE CHASE SPACE SHALL ROUTE AS TIGHT TO THE WALL AS POSSIBLE TO MAXIMIZE MAINTENANCE ACCESS SPACE.



SHEET NOTES

- 1 3" SANITARY WASTE FOR ISLAND WASH FOUNTAIN. PROVIDE WITH AIR ADMITTANCE VALVE AT WASH FOUNTAIN.

GREASE INTERCEPTOR CALCULATIONS

Quote: 891BC1CA

Reference No. 74689 Project Name: Mimm's Park Concession

Step 1: Flow rate to grease interceptor

Fixture flow rate: (cu in / 231) = gal x 0.75 / 2 min = 2 min flow rate

NAME	TYPE	DIMENSIONS	QTY	CU IN	FLOW RATE
3 Compartment Sink	3 Compartment Sink	21" x 21" x 14" (3)	1	18,522	30.07 GPM
Floor Drain	Floor Drain	N/A	1	N/A	0 GPM
Floor Sink	Floor Sink	N/A	1	N/A	0 GPM
Hand Sink	Hand Sink	10" x 14" x 5"	1	700	1.14 GPM

Total 31.2 GPM

Step 2: Grease Production

Servings per day x Grease production value x Days between pump-outs = Grease output

Servings per day: 100

Grease production value: 0.005 lbs per serving (Snack Bar: Low / No flatware)

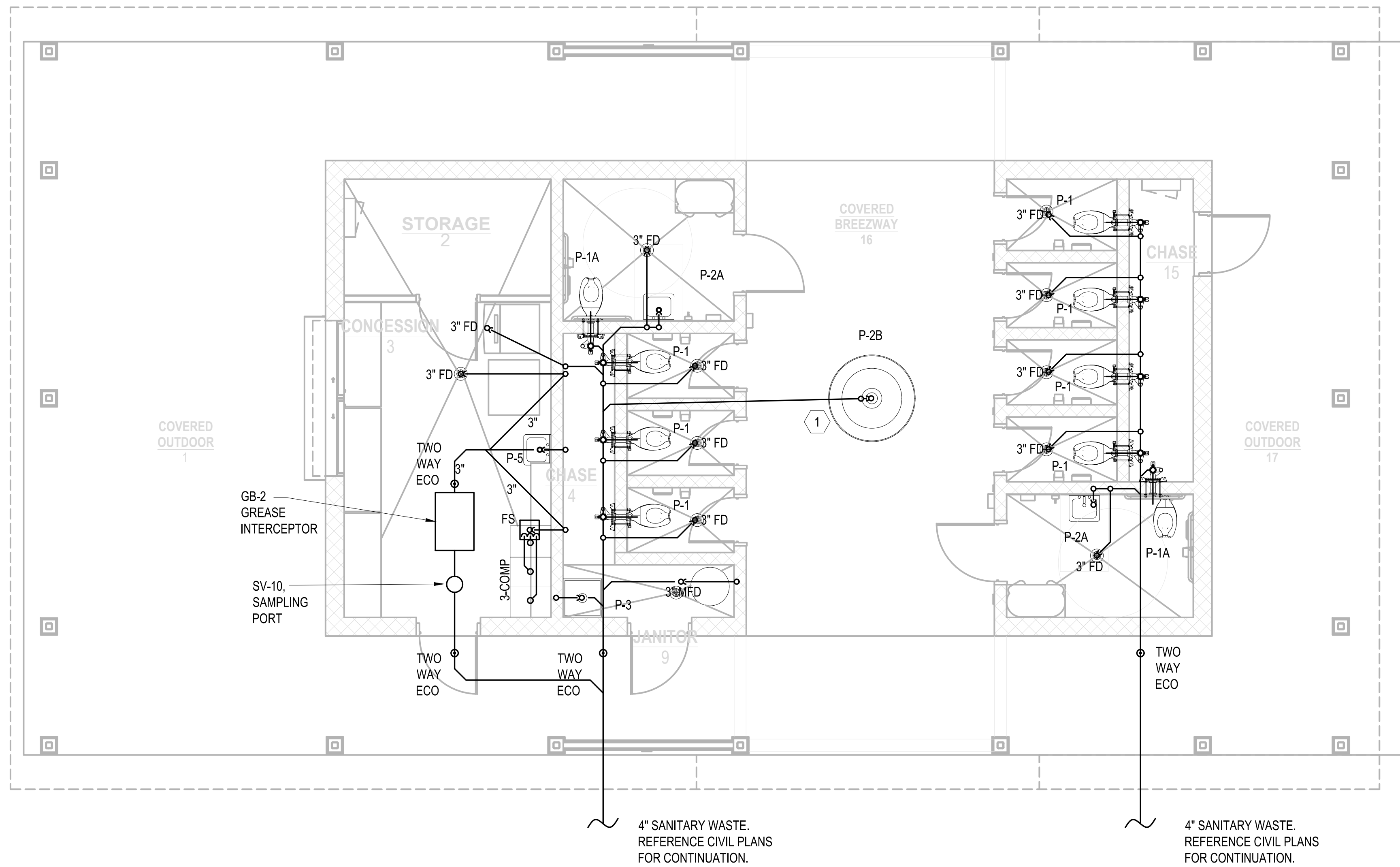
Days between pump-outs: 90 days

100 x 0.005 x 90 = 45 lbs of FOG

SCHIER MODEL	Description:
GB2	GREASE INTERCEPTOR 35 GPM / 50 GPM, 4" FPT CONNECTIONS W/ 3" AND 4" PLAIN END ADAPTERS, PEDESTRIAN RATED POLYPROPYLENE COVER Dimensions: Length: 35", Width: 23", Height: 13.75" Flow Rate/Grease Capacity: 35 GPM / 130 lbs Liquid Capacity: 20 gal

Specification Note: This Great Basin model has been sized to the flow rate and grease production requirements of the application and may not be substituted by liquid capacity alone. Any substitution requests must be approved by the specifying engineer and the authority having jurisdiction.

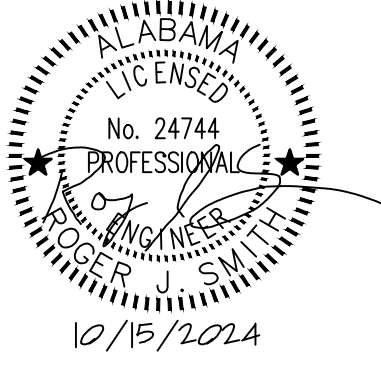
Please contact support@schierproducts.com for technical and procurement support for the specified Great Basin model.



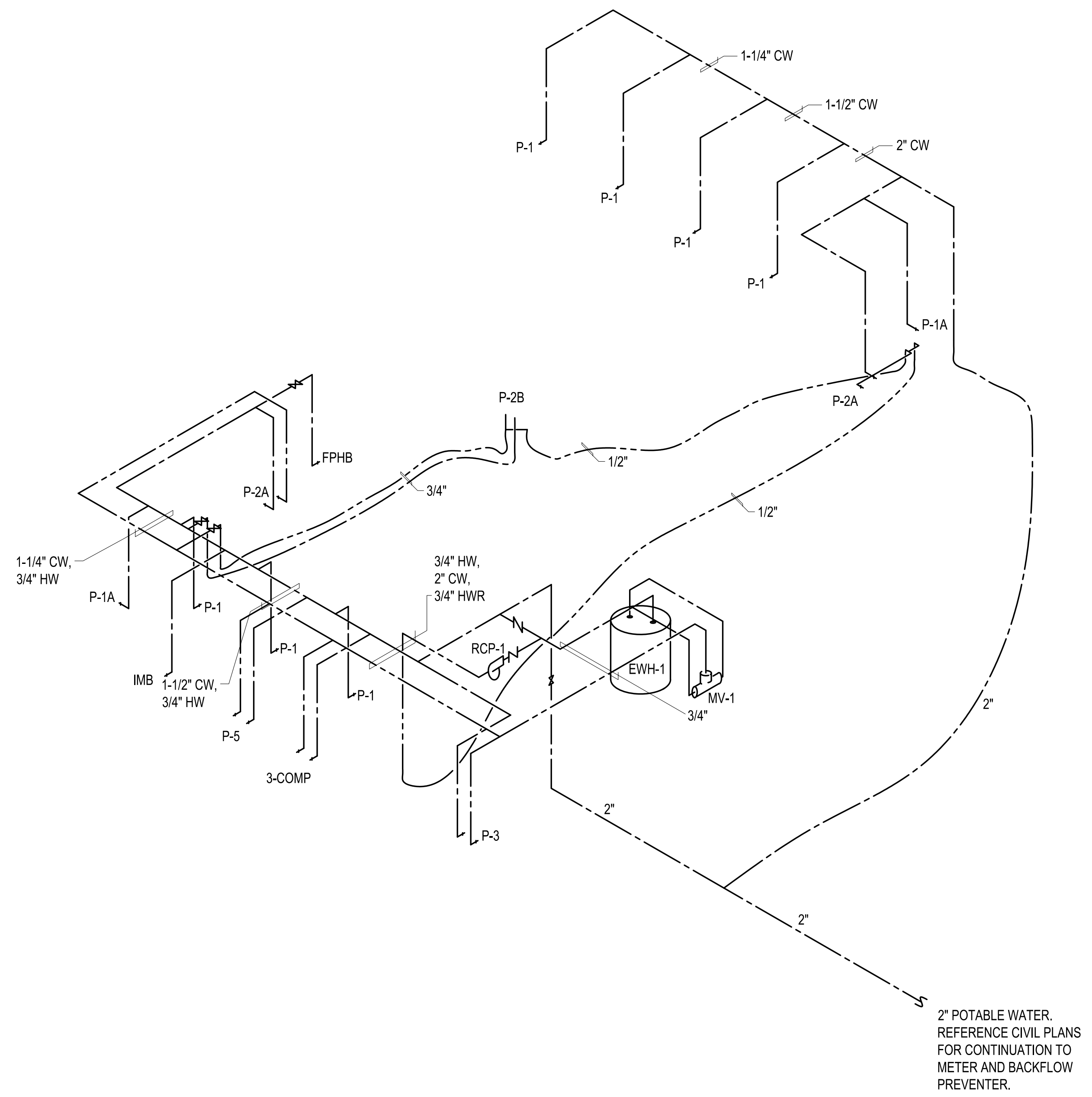
1 SANITARY WASTE PLAN
SCALE: 1/4"=1'-0"

ARCHITECTURAL DRAWINGS FOR:
CITY OF MOBILE - MIMS FACILITIES

SCALE: AS NOTED Mobile, AL

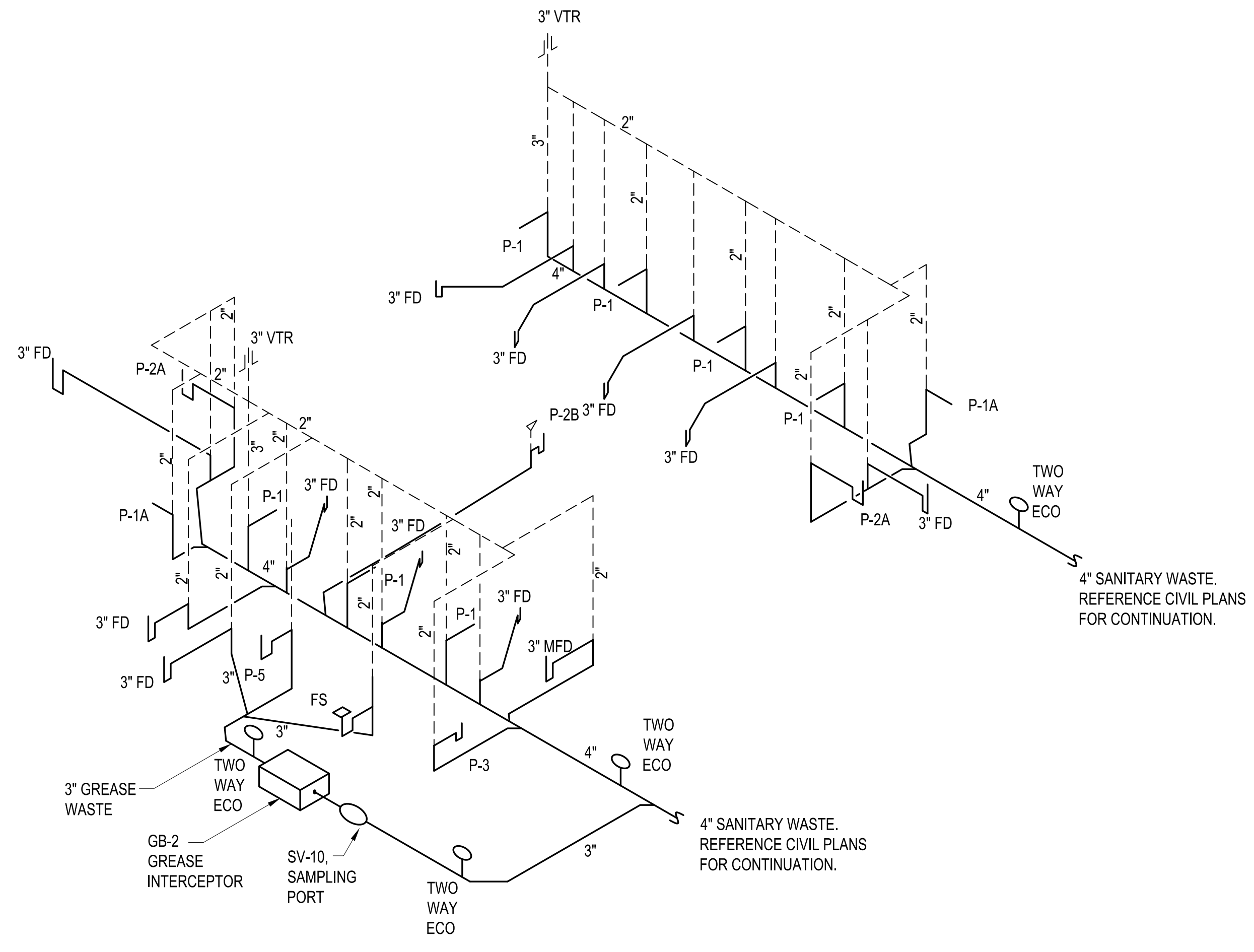


DATE: 10/15/2024
P3.0



2 PLUMBING RISER
NOT TO SCALE

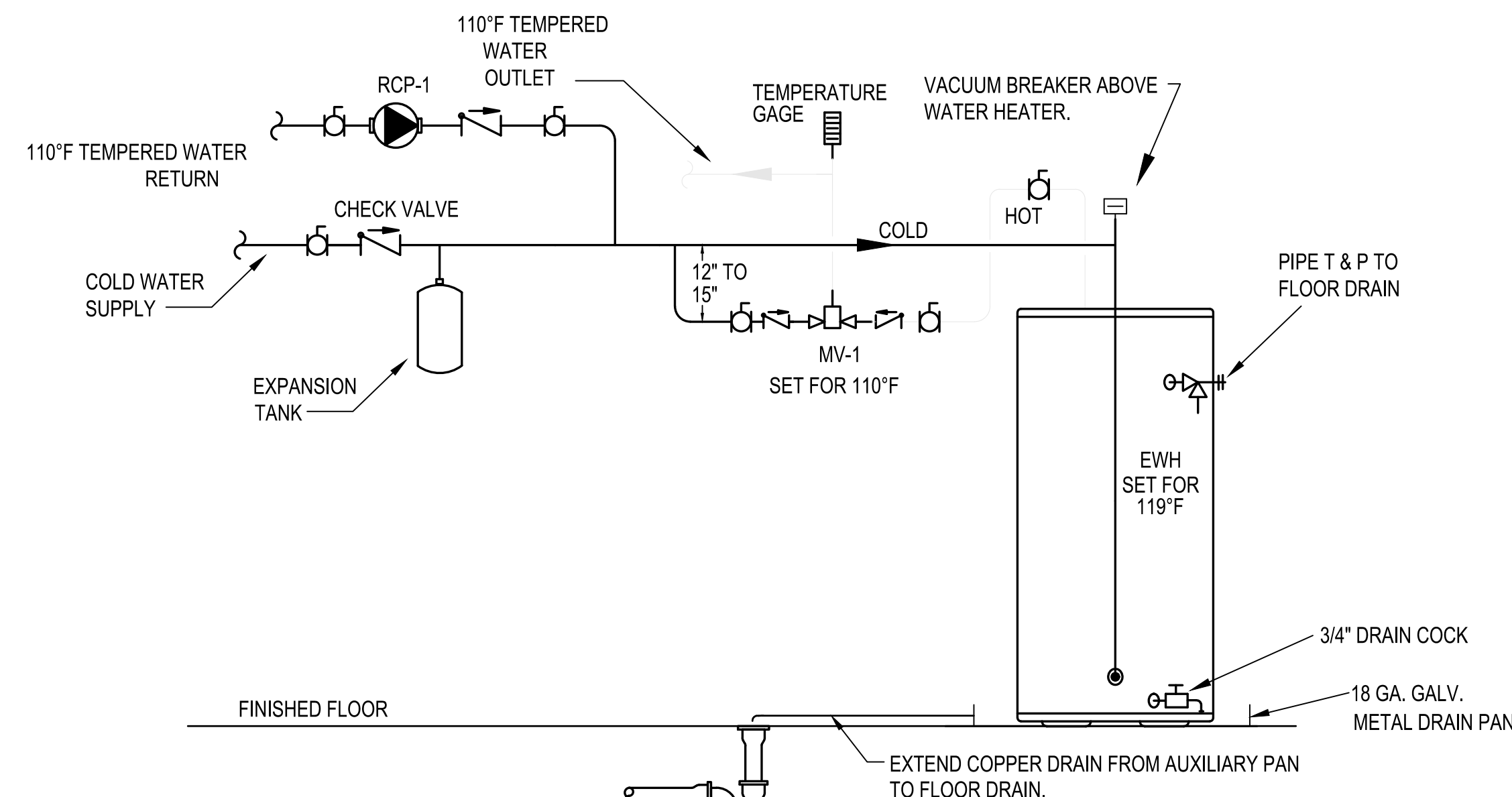
2" POTABLE WATER.
REFERENCE CIVIL PLANS
FOR CONTINUATION TO
METER AND BACKFLOW
PREVENTER.



1 SANITARY WASTE RISER
NOT TO SCALE

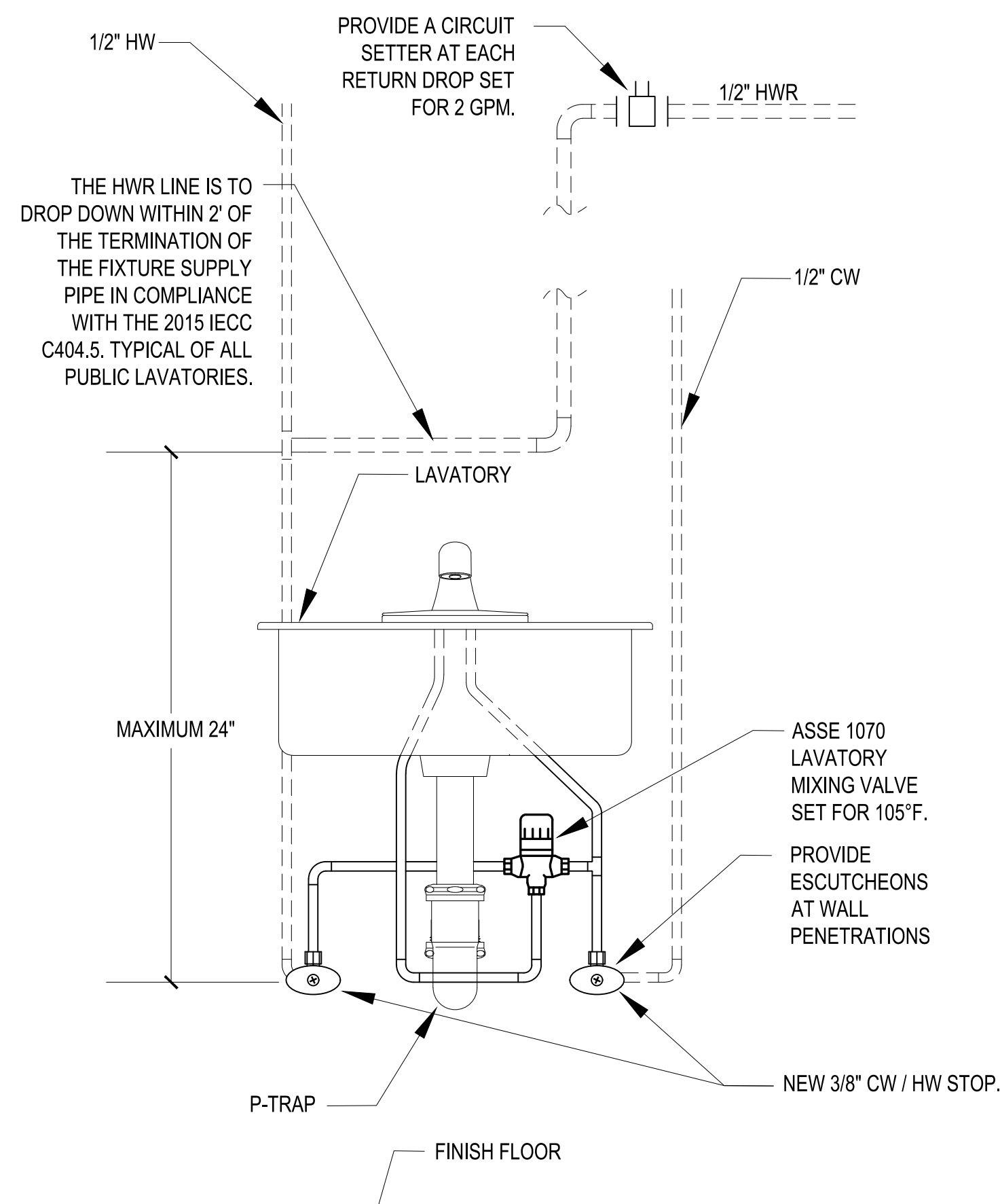
4" SANITARY WASTE.
REFERENCE CIVIL PLANS
FOR CONTINUATION.

4" SANITARY WASTE.
REFERENCE CIVIL PLANS
FOR CONTINUATION.

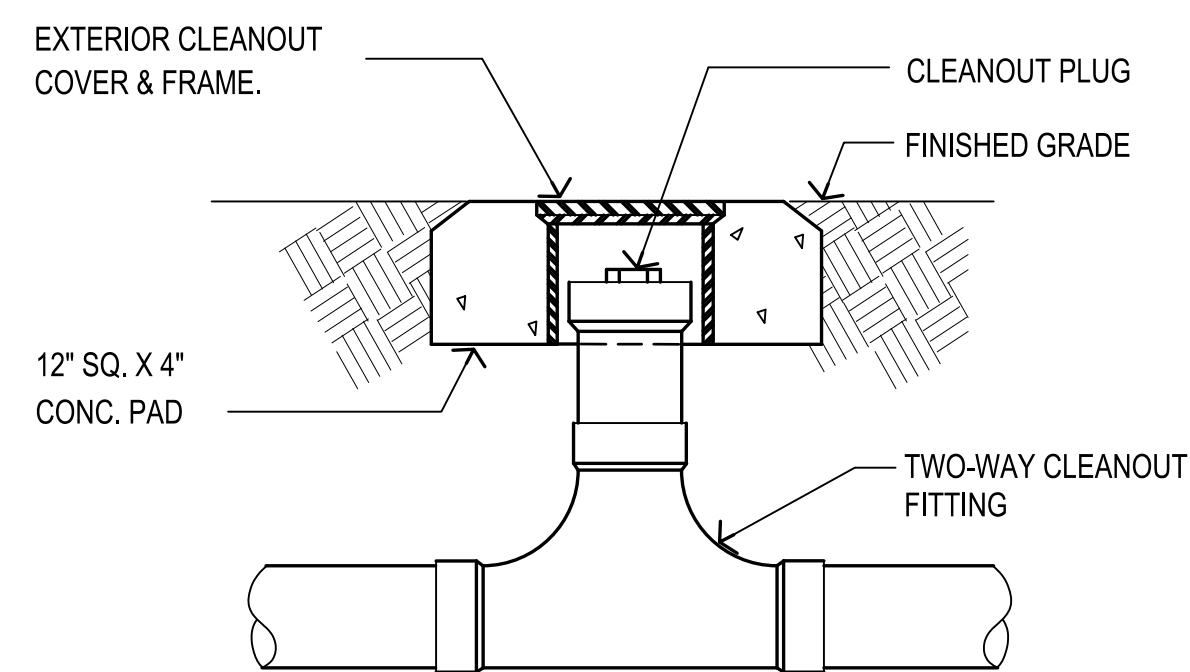


- NOTES:
1. PIPING DIAGRAM. SEE MANUFACTURERS RECOMMENDATIONS FOR ADDITIONAL INFORMATION.
 2. THE TEMPERATURE AND PRESSURE RELIEF VALVE SETTING SHALL NOT EXCEED PRESSURE RATING OF ANY COMPONENT IN THE SYSTEM.
 3. SERVICE VALVES ARE SHOWN FOR SERVICING UNIT. HOWEVER, LOCAL CODES SHALL GOVERN THEIR USAGE.

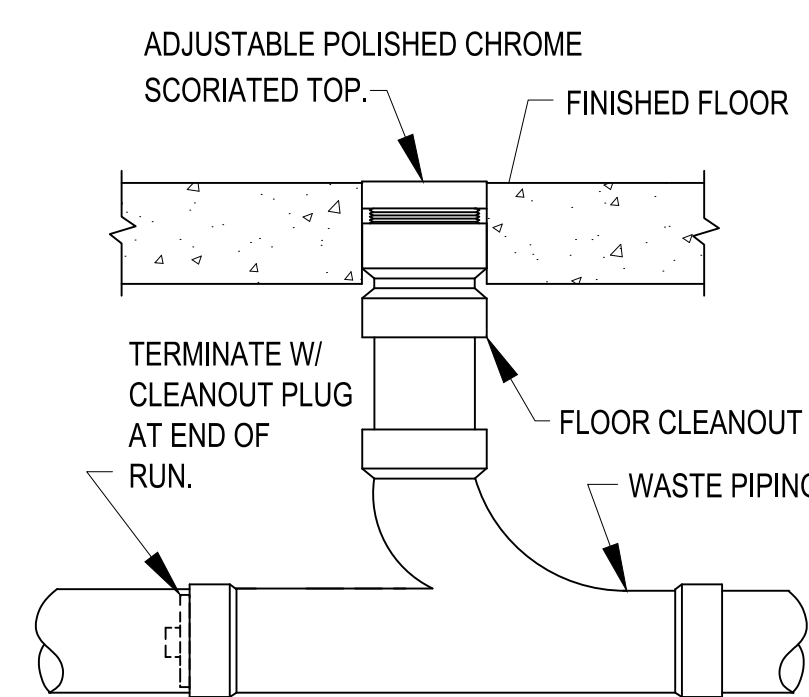
1 WATER HEATER PIPING DIAGRAM
NOT TO SCALE



2 LAVATORY MIXING VALVE DETAIL
NOT TO SCALE



3 TWO-WAY CLEANOUT DETAIL
NOT TO SCALE



4 FLOOR CLEANOUT DETAIL
NOT TO SCALE

Quote: 891BC1CA

B1	6" minimum compacted base (clean aggregate 3/4" in size or smaller)
BL	Backfill (clean aggregate 3/4" in size or smaller) - DO NOT COMPACT BACKFILL MECHANICALLY
CL	Pedestrian rated bolted polypropylene cover
FT	Floor Tile
IN	4" diameter inlet pipe
OT	4" diameter outlet pipe
PA	Minimum 4" thick concrete pad with rebar required for pedestrian traffic or greenspace areas. Concrete to be 28 day compressive strength to 4,000 PSI.
RI	FCR1 field cut riser to grade
RS	FCR10 field cut riser to grade
SC	12" clear all sides

DETAIL Mimm's Park Concession Indoors, Below Grade

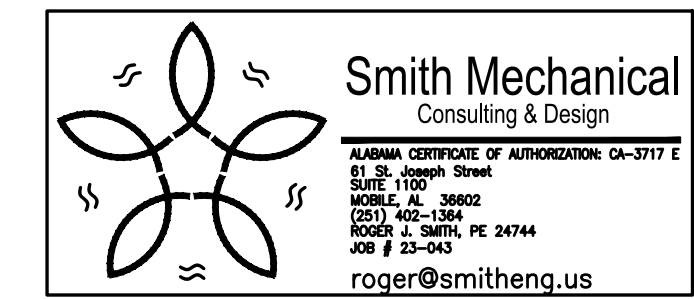
GB2 GREASE INTERCEPTOR 35 GPM / 50 GPM, 4" FPT CONNECTIONS W/ 3" AND 4" PLAIN END ADAPTERS, PEDESTRIAN RATED POLYPROPYLENE COVER

SV10 SEWER VIEWER SAMPLING PORT, 4" CONNECTIONS (FIELD MODIFIABLE TO 6"), POLYETHYLENE COVER

Disclaimer: this Detail represents manufacturer directed guidance regarding the grease interceptor system. The contents of this document are not a substitute for local jurisdiction requirements and plumbing code standards. Please follow all local ordinances when installing.

SCHIER
LIFETIME GUARANTEED
GREASE INTERCEPTORS
schierproducts.com

5 GREASE INTERCEPTOR DETAIL
NOT TO SCALE



FAN SCHEDULE														
MARK FAN	AIR FLOW (CFM)	STATIC PRESSURE (in of H2O)	DRIVE TYPE	FAN TYPE	FAN SERVICE	INTERLOCK WITH	MAXIMUM RPM	MAXIMUM SONES	MOTOR		ELECTRICAL DATA			NOTES
									WATTS	HORSE POWER	VOLTS	Hz	PHASE	
EF-1	70	0.25	DIRECT	CEILING	RESTROOMS	LIGHTS	1,200	3.0	89	N/A	120	60	1	1, 2, 3
NOTES														
1	COORDINATE ALL ELECTRICAL REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR.													
2	PROVIDE FAN WITH SOLID STATE SPEED CONTROLLER. CONTROLLER SHALL BE LOCATED ABOVE THE CEILING ADJACENT TO THE FAN. PROVIDE FAN WITH MOTION SENSOR AND DELAY ON BREAK RELAY. SET RELAY FOR FAN TO REMAIN OPERATIONAL FOR 30 MINUTES AFTER SPACE BECOMES UNOCCUPIED.													
3	EXTEND RIGID EXHAUST DUCT TO ROOF MOUNTED DISCHARGE HOOD. SEE PLAN FOR ADDITIONAL INFORMATION.													

DUCTLESS SPLIT HEAT PUMP UNIT SCHEDULE														
MARK DSSHP/DSSAH/	AIR DATA		COOLING CAPACITY (AT AHRI STANDARD 210/240)				COMPRESSOR RLA	MINIMUM SEER	ELECTRICAL DATA					NOTES
	TOTAL (CFM)	EDB (°F)	EWB (°F)	AMBIENT (°F)	TOTAL BTUH	VOLTS			Hz	PHASE	MCA (AMPS)	MOCP (AMPS)		
1	286	80	67	95	9,000	4.5	16.5	230	60	1	18.8	30	1,2,3,4	
NOTES														
1	COORDINATE ALL ELECTRICAL REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR.													
2	PROVIDE UNIT AS A SINGLE POINT POWER CONNECTION TO THE OUTDOOR UNIT. POWER TO INDOOR UNIT IS SUPPLIED FROM THE OUTDOOR UNIT. PROVIDE MOTOR RATED TWO POLE SWITCH AT INDOOR UNIT FOR DISCONNECT.													
3	PROVIDE UNIT WITH REMOTE WALL MOUNTED TYPE THERMOSTAT. PROVIDE WITH INTEGRAL CONDENSATE PUMP. EXTEND INSULATED SCH 40 PVC CONDENSATE DRAIN FROM UNIT TO JANITOR'S SINK FOR DISPOSAL.													
4	BASIS OF DESIGN CARRIER 38MHR09/40MMHC09 SERIES. INDOOR UNIT IS TO BE SURFACE MOUNTED ON THE WALL AS HIGH AS POSSIBLE.													

HVAC GENERAL NOTES:

- INSTALL ALL WORK IN COMPLIANCE WITH THE LOCAL AUTHORITY HAVING JURISDICTION, THE 2021 INTERNATIONAL MECHANICAL CODE, AND THE 2015 INTERNATIONAL ENERGY CONSERVATION CODE.
- COORDINATE ALL ELECTRICAL REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR PRIOR TO BEGINNING ANY WORK.
- INSTALL OUTDOOR UNITS ON A FACTORY FABRICATED WALL MOUNTING BRACKET.
- DUCT CONSTRUCTION SHALL BE PER THE LATEST REQUIREMENTS OF NFPA 90A AND 90B, SMACNA AND ASHRAE AND SHALL MEET OR EXCEED THEIR REQUIREMENTS FOR SUPPORT AND REINFORCEMENT.
- REFRIGERANT SUCTION LINES SHALL BE INSULATED WITH FLEXIBLE ELASTOMERIC INSULATION WITH A MINIMUM THICKNESS OF 0.5". ALL INSULATION INSTALLED AT BUILDING EXTERIOR SHALL BE PAINTED WITH TWO COATS OF WHITE UV PROTECTIVE PAINT. REFRIGERANT PIPING SHALL BE INSTALLED PER SPECIFIC MANUFACTURER'S REQUIREMENTS.
- BRANCH SUPPLY AND RETURN DUCT RUNOUTS SHALL BE GALVANIZED SNAP-LOCK WITH ALL JOINTS AND SEAMS SEALED WITH MASTIC. TRAVERSE JOINTS SHALL BE CONNECTED WITH SHEET METAL SCREWS MINIMUM 6" ON CENTER. ALL GALVANIZED DUCT SHALL BE INSULATED WITH 2" THICK, 1 POUND DENSITY WRAP INSULATION. INSULATION TO BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS.
- FLEXIBLE DUCT TO SUPPLY GRILLES SHALL NOT EXCEED 8'-0". ROUTE EXTERNALLY INSULATED RIGID SNAP LOCK DUCT TO WITHIN 8'-0" OF GRILLE.
- EQUIPMENT PROVIDED AND INSTALLED ON THIS PROJECT SHALL MEET OR EXCEED THE MINIMUM EFFICIENCY REQUIREMENTS INDICATED IN THE SCHEDULE.
- DUCT CONSTRUCTION SHALL BE G-90 GALVANIZED SHEET METAL. DUCT SEALING SHALL BE CLASS "A", ALL JOINTS, SEAMS, AND PENETRATIONS SHALL BE BRUSHED WITH 2 COATS OF WATER BASED MASTIC. THE DUCT SEAL SHALL MEET OR EXCEED PRESSURE CLASS 2".
- ALL SHEET METAL DUCT SHALL BE EXTERNALLY INSULATED WITH 2" THICK, MINIMUM R-6.0 DUCT WRAP WITH AN FSK JACKET. JOINTS AND SEAMS SHALL OVERLAP 2" AND SHALL BE STAPLED AT 6" ON CENTER. ALL INSULATION JACKET JOINTS AND SEAMS SHALL BE SEALED WITH PRESSURE SENSITIVE TAPE. INSULATION APPLIED TO DUCT DIMENSIONS GREATER THAN 24" SHALL BE SECURED ON THE BOTTOM OF THE DUCT WITH MECHANICAL FASTENERS AT 18" ON CENTER.
- THE MECHANICAL CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR AND OTHER TRADES ALL REQUIRED OPENINGS IN WALLS, FOUNDATIONS, FLOORS, AND ROOFS. CONTRACTOR SHALL INSTALL LOUVERS PER MANUFACTURERS RECOMMENDATIONS AND DETAILS INDICATED ON THE ARCHITECTURAL PLANS.
- ALL OUTSIDE AIR INLETS SHALL BE LOCATED A MINIMUM OF 10 FEET FROM ANY EXHAUST AIR OUTLET OR PLUMBING VENT STACK. COORDINATE WITH THE PLUMBING DRAWINGS AND WITH THE PLUMBING AND GENERAL CONTRACTORS IN THE FIELD.
- THE MECHANICAL CONTRACTOR SHALL VERIFY ALL MECHANICAL EQUIPMENT LOCATIONS AND BE RESPONSIBLE FOR ALL RELATED CLEARANCES IN THE FIELD. PROVIDE CLEARANCE IN FRONT OF ALL ELECTRICAL PANELS PER NATIONAL ELECTRIC CODE REQUIREMENTS. DUCT SHALL NOT ROUTE OVER ELECTRICAL PANELS.
- OFFSET AND TRANSITION DUCT AS NECESSARY TO AVOID STRUCTURAL MEMBERS OR EQUIPMENT CONNECTION SIZES. PROVIDE FLEXIBLE DUCT CONNECTORS ON ALL DUCT CONNECTION TO MOTORIZED EQUIPMENT.

COMcheck Software Version COMcheckWeb
Mechanical Compliance Certificate

Project Information

Energy Code: 2015 IECC
 Project Title: Mimms Park
 Location: Mobile, Alabama
 Climate Zone: 2a
 Project Type: New Construction

Construction Site: _____ Owner/Agent: _____ Designer/Contractor: _____

Additional Efficiency Package(s)
Credits: 1.0 Required 0.0 Proposed

Mechanical Systems List

Quantity System Type & Description

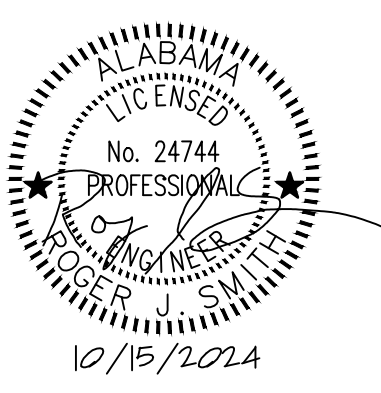
1 DSSHP/DSSAHU-1 (Single Zone):
 Split System Heat Pump
 Heating Mode: Capacity = 10 kBtu/h,
 Proposed Efficiency = 8.20 HSPF, Required Efficiency = 8.20 HSPF
 Cooling Mode: Capacity = 9 kBtu/h,
 Proposed Efficiency = 16.50 SEER, Required Efficiency = 14.00 SEER
 Proposed Part Load Efficiency = 0.00, Required Part Load Efficiency = 0.00

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2015 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

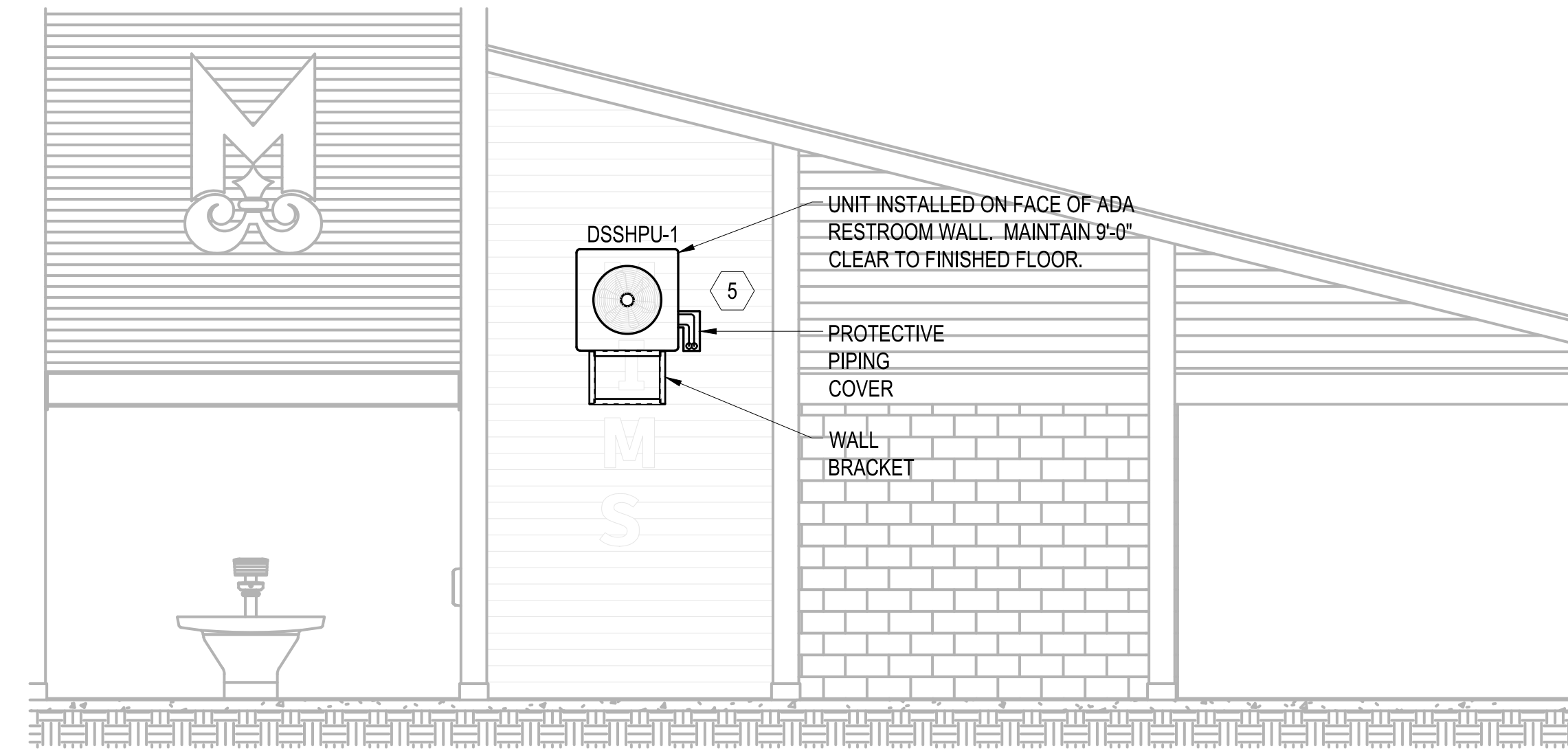
Roger J. Smith, PE
 Name - Title _____ Signature _____ Date _____

Project Title: Mimms Park Report date: 02/29/24
 Data filename: _____

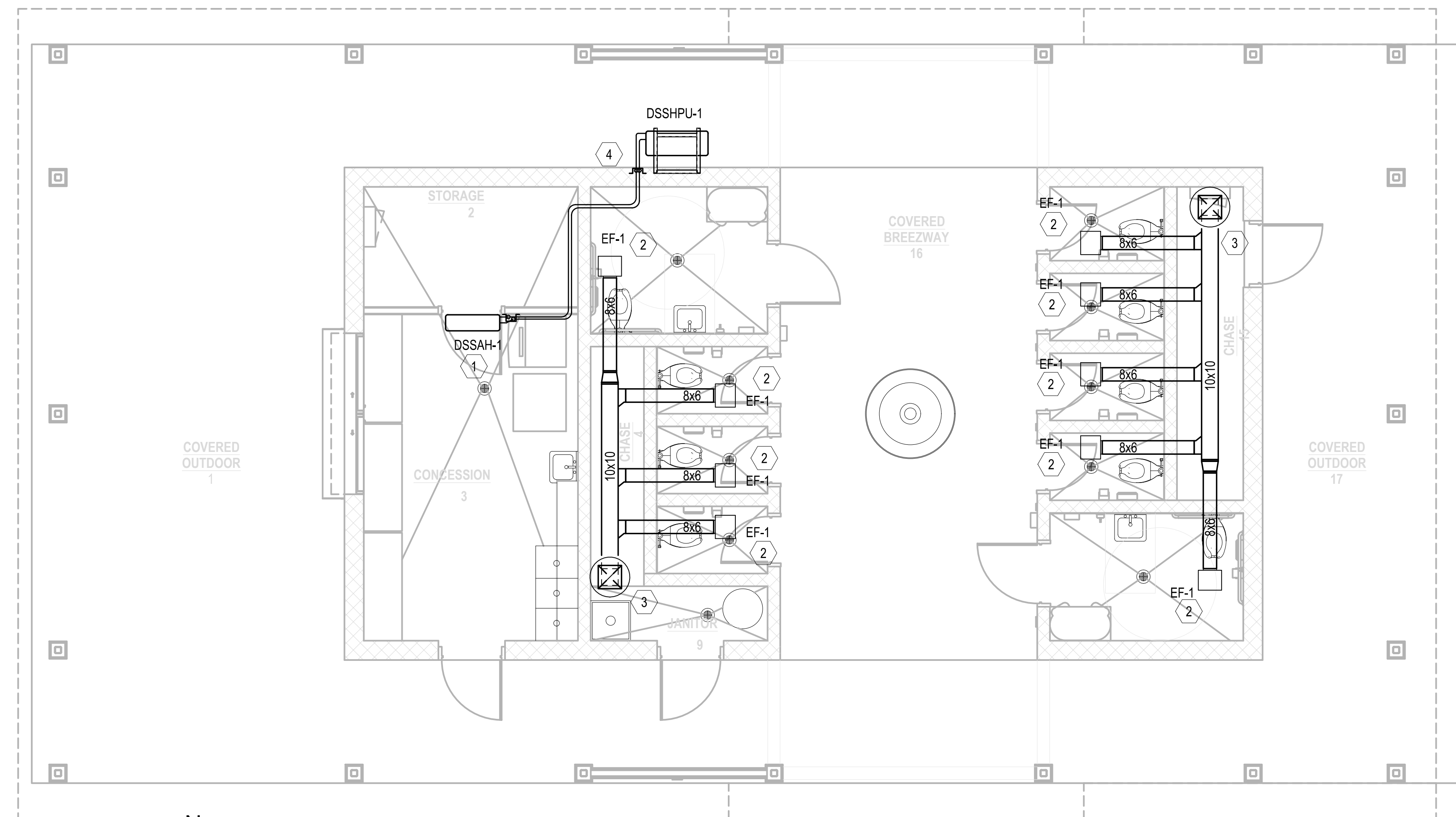


SHEET NOTES

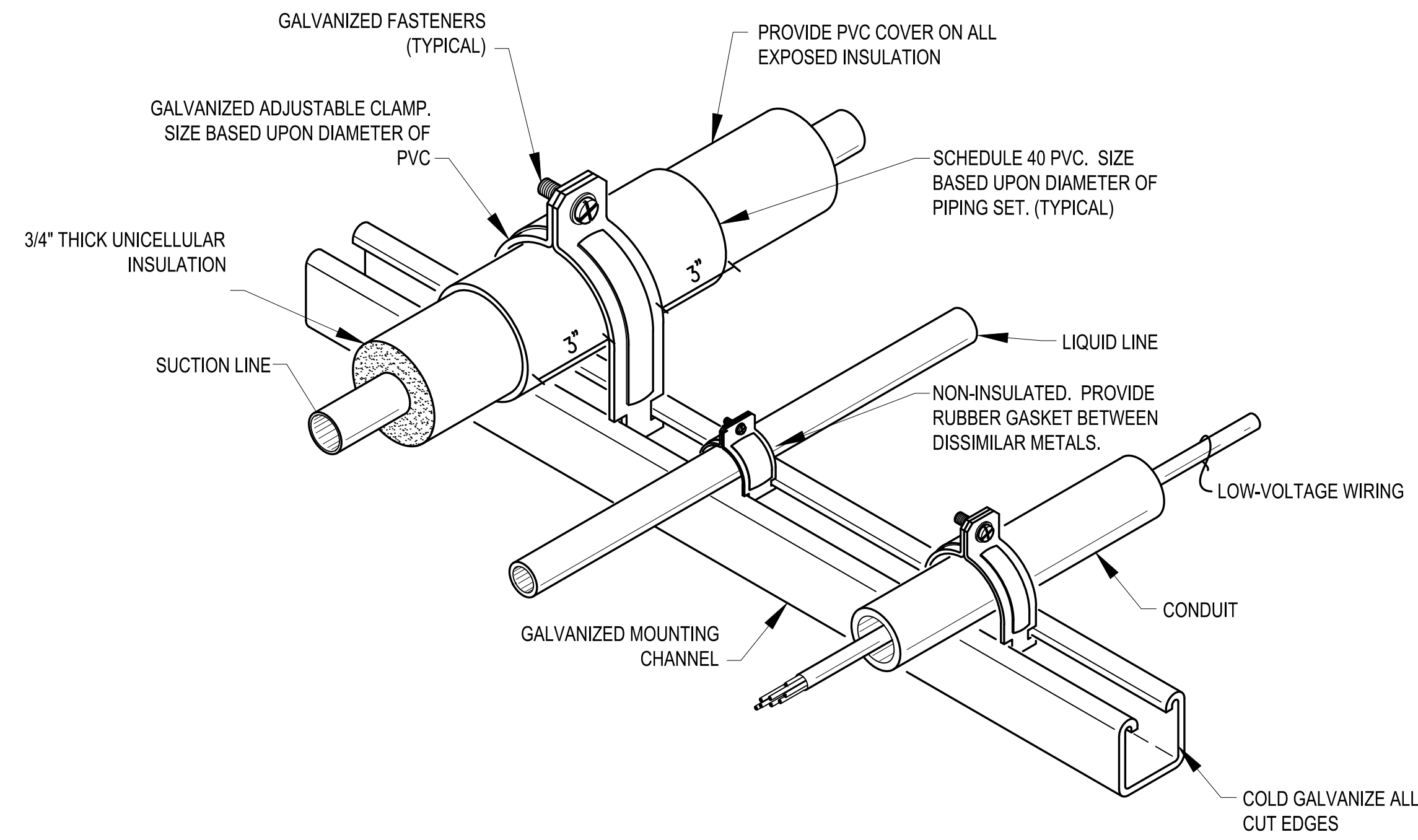
- 1 INSTALL INDOOR UNIT AS HIGH AS POSSIBLE ABOVE DOORWAY. EXTEND PUMPED, INSULATED, RIGID CONDENSATE DRAIN PIPING TO JANITOR'S SINK FOR DISPOSAL.
- 2 EXTEND EXHAUST DUCT FROM FAN, EF-1, AS INDICATED FOR CONNECTION TO EXHAUST DISCHARGE TRUNK DUCT. EXHAUST FANS ARE POWERED FROM THE LIGHTING CIRCUIT THAT IS ON A TIMER. THE FANS SHALL BE PROVIDED WITH A MOTION SENSOR. AS THE TOILET ROOM IS OCCUPIED, THE FAN SHALL ENERGIZE. PROVIDE THE FAN WITH A DELAY ON BREAK RELAY FOR THE FAN TO REMAIN RUNNING FOR 30 MINUTES AFTER OCCUPANCY.
- 3 EXTEND EXHAUST TRUNK DUCT UP THROUGH ROOF FOR CONNECTION TO LOW SILHOUETTE DISCHARGE CAP. DISCHARGE CAP SHALL BE EQUAL TO COOK MODEL "PR" SIZE 12. TRANSITION DUCT FROM INDICATED SIZE TO FULL SIZE OF VENTILATOR CONNECTION. PROVIDE WITH ROOF CURB. SECURE CURB TO THE BUILDING STRUCTURE AND THE VENTILATOR TO THE CURB TO MEET THE LOCAL WIND LOADING REQUIREMENTS INDICATED ON THE ARCHITECTURAL PLANS AND SPECIFICATIONS.
- 4 REFRIGERANT PIPING SHALL PENETRATE EXTERIOR WALL ADJACENT TO UNIT. PROVIDE PROTECTIVE COVER AT PENETRATION, SEE DETAIL FOR ADDITIONAL INFORMATION. CONTINUE PIPING TO BUILDING INTERIOR AND ROUTE UP ALONG INSIDE OF WALL TO A POINT ABOVE THE CEILING. CONTINUE PIPING TO A POINT ABOVE THE INDOOR UNIT. TURN DOWN FOR CONNECTION TO INDOOR UNIT. PROVIDE PROTECTIVE ALUMINUM COVER OVER PIPING AT THE BUILDING INTERIOR AS IT RISES TO ABOVE THE CEILING ADJACENT TO THE INDOOR UNIT.
- 5 OUTDOOR UNIT TO BE INSTALLED ON A FACTORY FABRICATED WALL BRACKET. INSTALL UNIT TO PROVIDE A CLEARANCE OF 9'-0" FROM THE BOTTOM OF THE BRACKET/UNIT ASSEMBLY TO THE FINISHED FLOOR. INSTALL ASSEMBLY PER SPECIFIC MANUFACTURER'S RECOMMENDATIONS. SECURE UNIT AND BRACKET TO THE WALL PER SPECIFIC MANUFACTURER'S RECOMMENDATIONS.



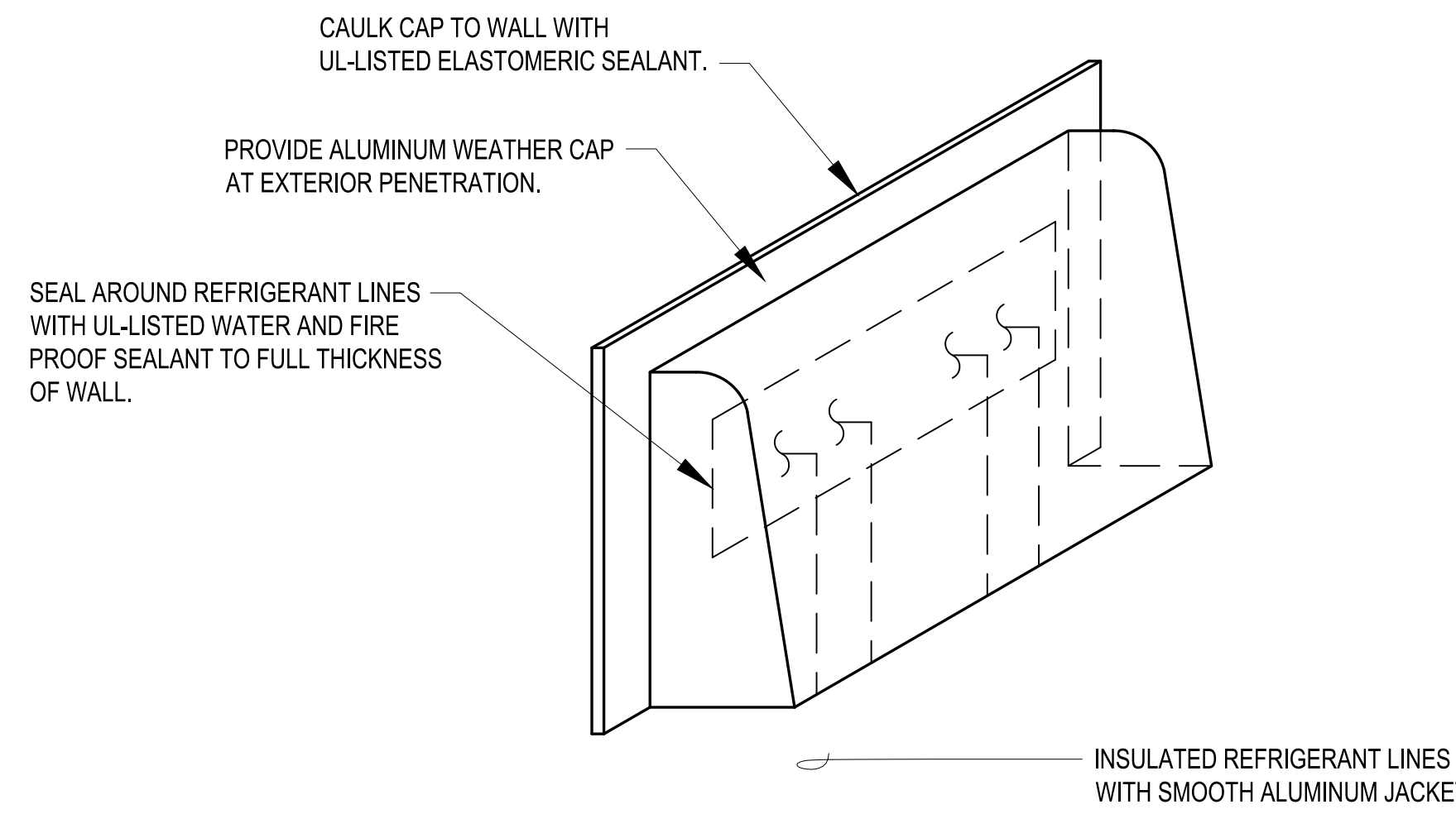
2 HVAC ELEVATION PLAN
 SCALE: 1/4"=1'-0"



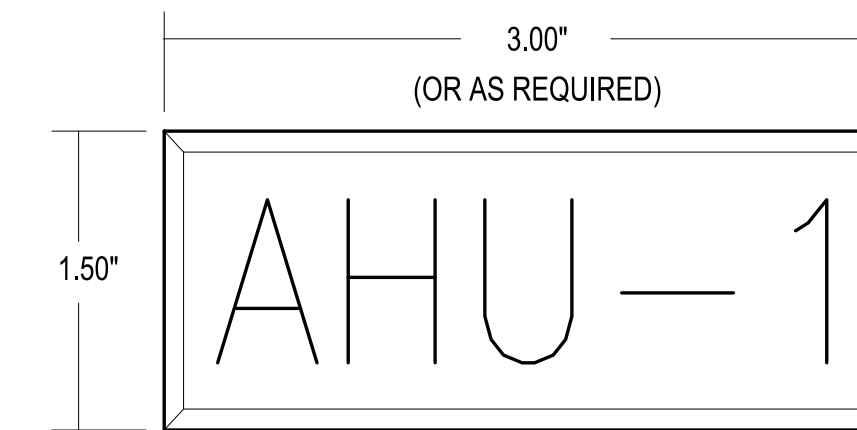
1 HVAC PLAN
 SCALE: 1/4"=1'-0"



1 REFRIGERANT PIPE MOUNTING DETAIL
NOT TO SCALE

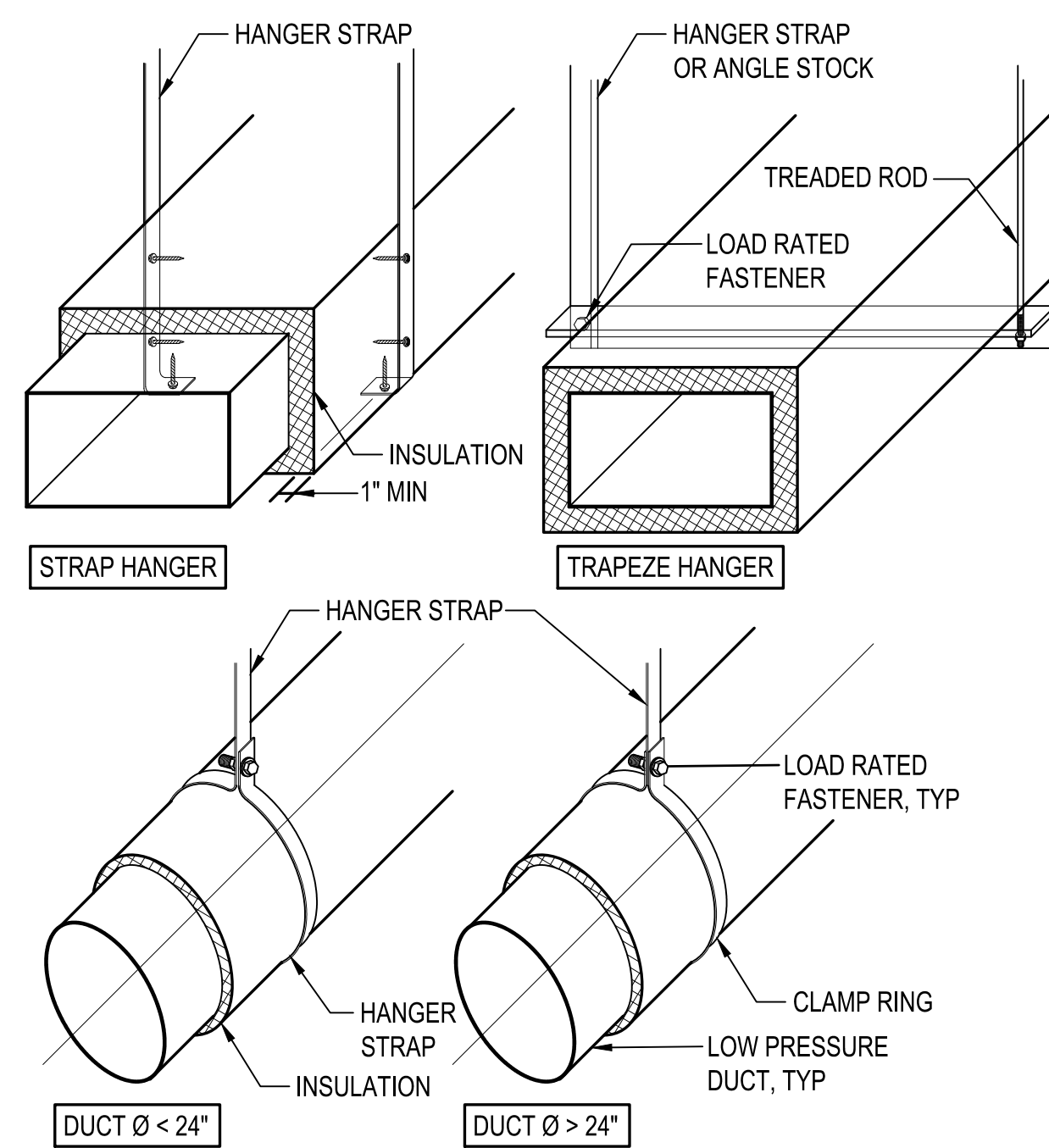


2 TYPICAL ALUMINUM WEATHER CAP DETAIL
NOT TO SCALE

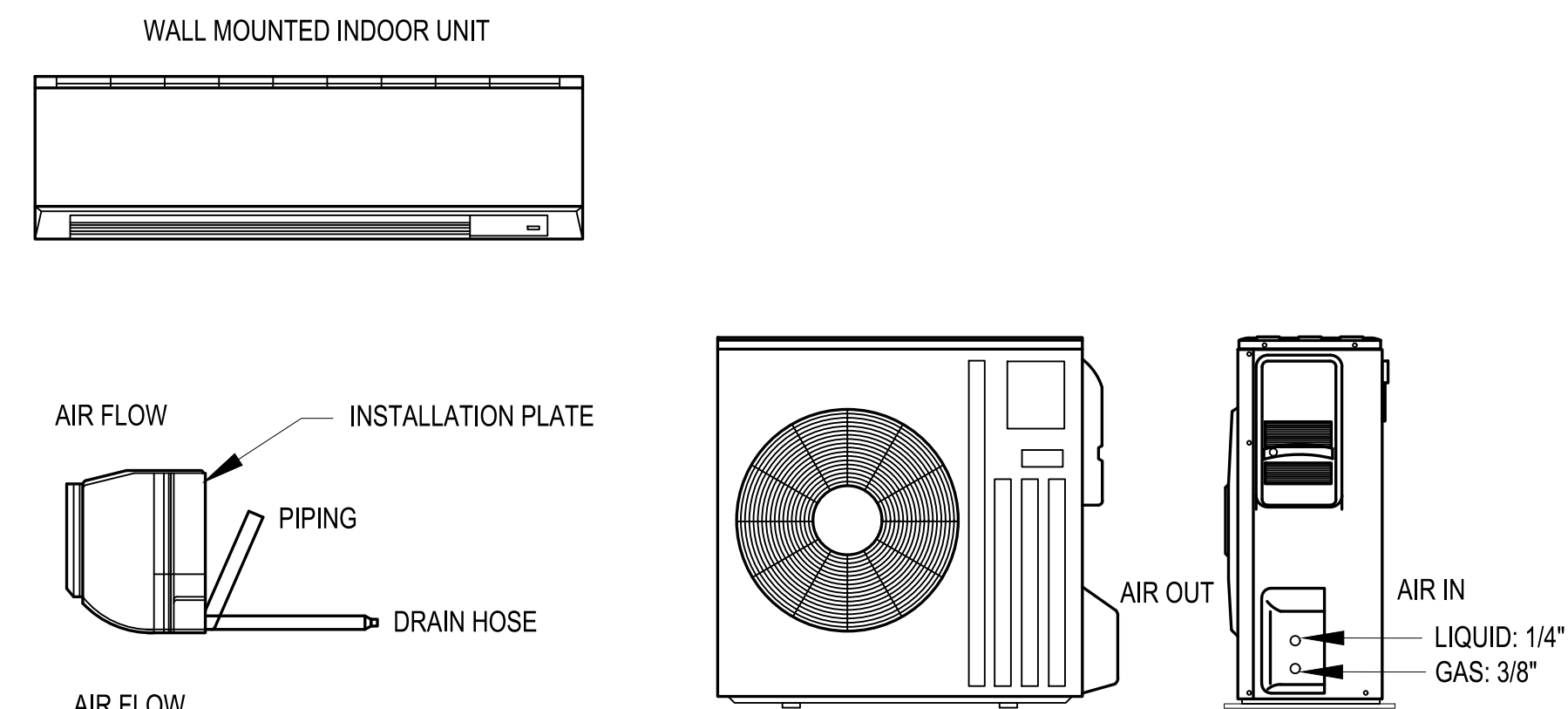


3 TYPICAL ENGRAVED TAG DETAIL
NOT TO SCALE

ENGRAVED PLASTIC TAG WITH 1" HIGH WHITE LETTERS ON BLACK BACKGROUND. TAG SHALL HAVE ALL EDGES BEVELED AND SMOOTH. SECURE TAG WITH PERMANENT, WATERPROOF DOUBLE SIDED TAG TAPE AT VISIBLE LOCATION ON MECHANICAL EQUIPMENT. LABEL ALL INDOOR AND OUTDOOR UNITS WITH NOTATION SHOWN ON PLANS.



4 DUCT HANGER DETAIL
NOT TO SCALE



NOTE: PROVIDE A WALL MOUNTING BRACKET AT OUTDOOR UNIT. PROVIDE CONDENSATE PUMP AT DSSAH AS NOTED ON DWG.

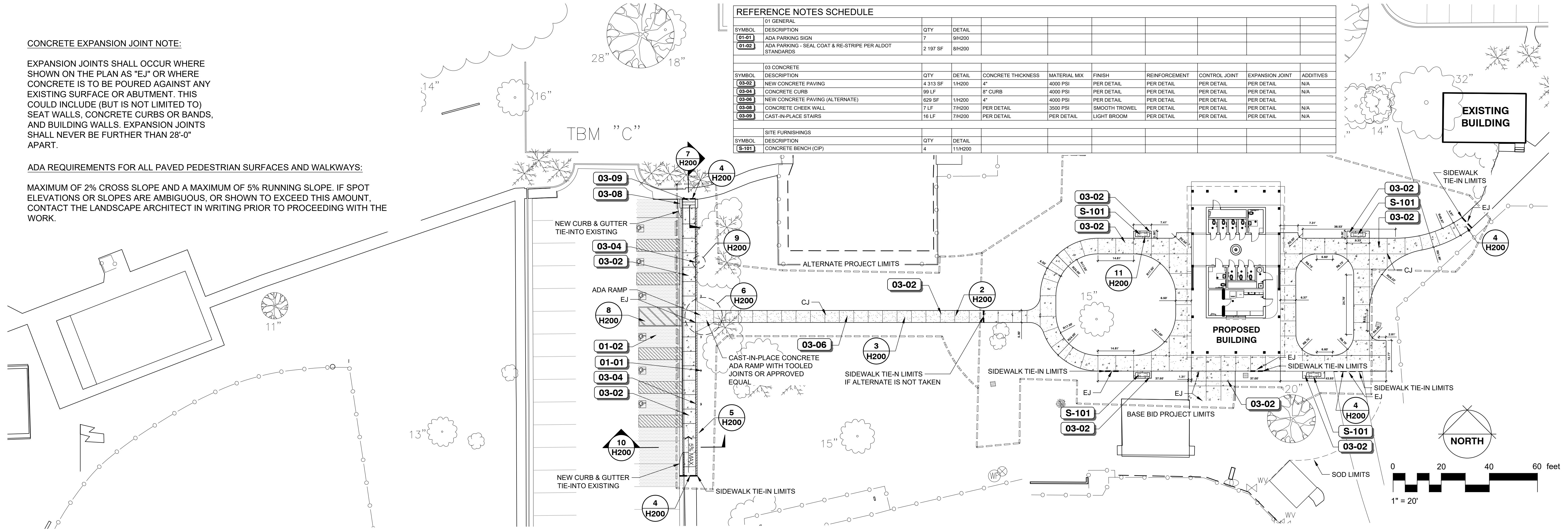
5 TYPICAL MINI SPLIT AHU & CONDENSING UNIT DETAIL
NOT TO SCALE

CONCRETE EXPANSION JOINT NOTE:

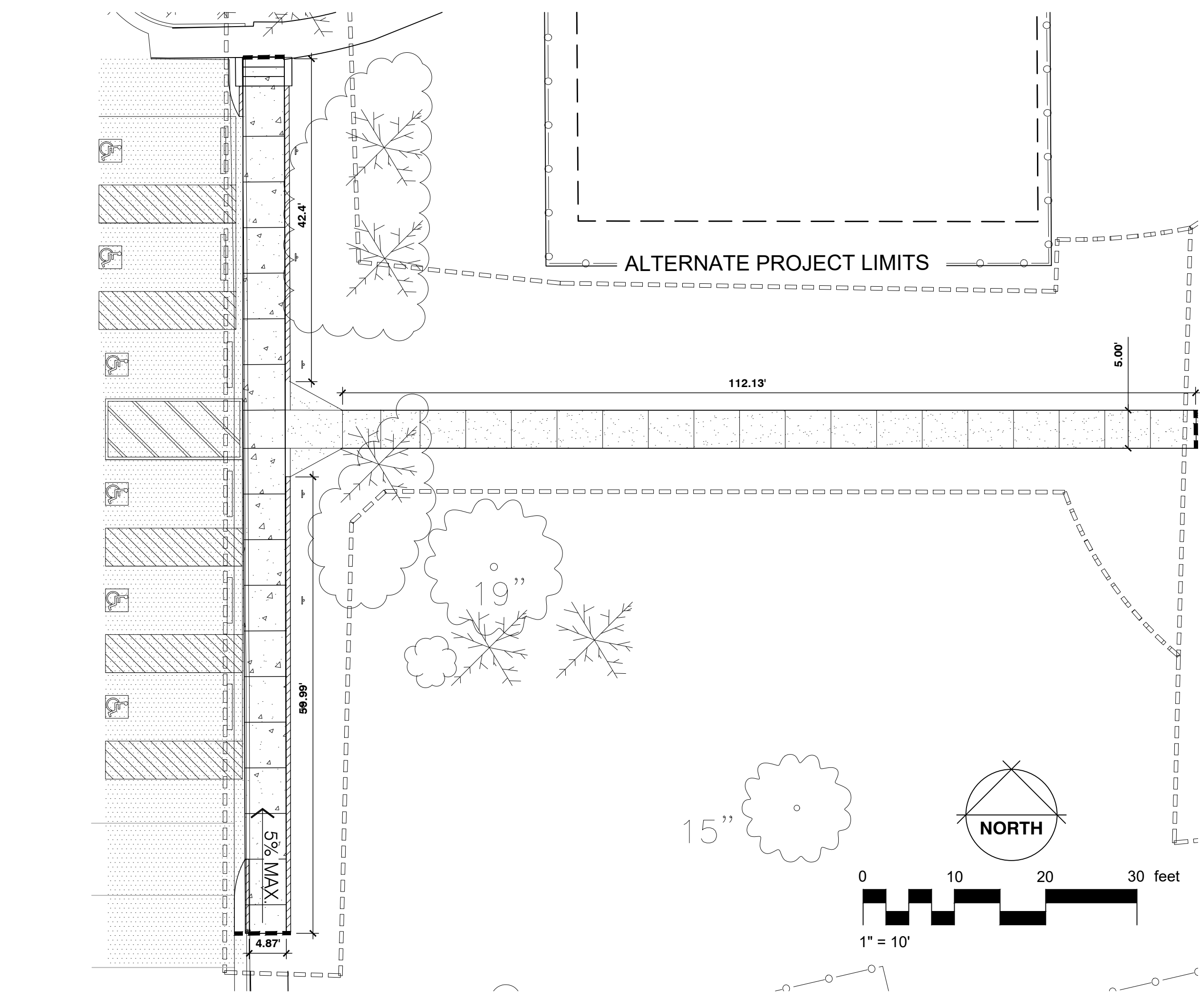
EXPANSION JOINTS SHALL OCCUR WHERE SHOWN ON THE PLAN AS "EJ" OR WHERE CONCRETE IS TO BE POURED AGAINST ANY EXISTING SURFACE OR ABUTMENT. THIS COULD INCLUDE (BUT IS NOT LIMITED TO) SEAT WALLS, CONCRETE CURBS OR BANDS, AND BUILDING WALLS. EXPANSION JOINTS SHALL NEVER BE FURTHER THAN 28'-0" APART.

ADA REQUIREMENTS FOR ALL PAVED PEDESTRIAN SURFACES AND WALKWAYS:

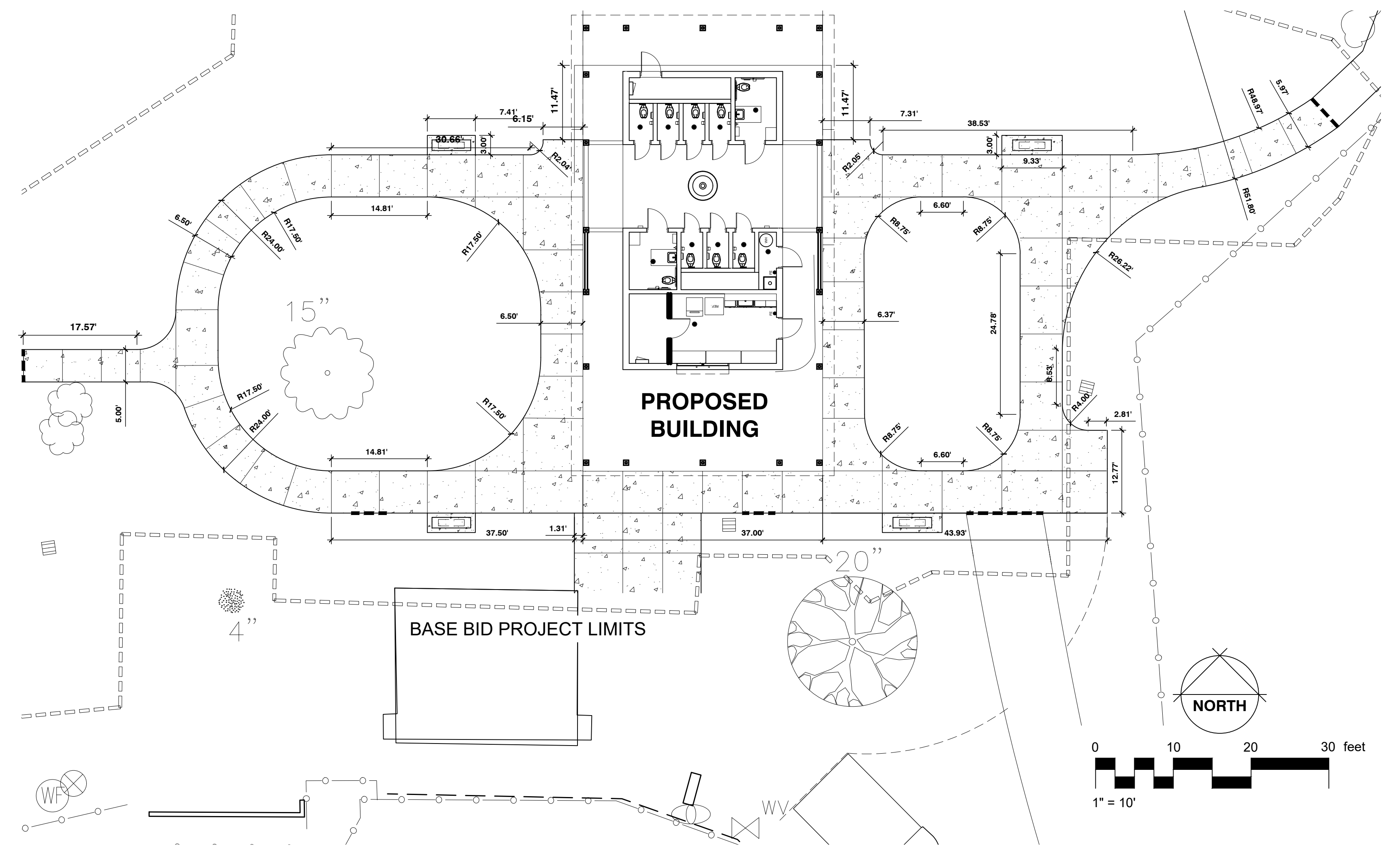
MAXIMUM OF 2% CROSS SLOPE AND A MAXIMUM OF 5% RUNNING SLOPE. IF SPOT ELEVATIONS OR SLOPES ARE AMBIGUOUS, OR SHOWN TO EXCEED THIS AMOUNT, CONTACT THE LANDSCAPE ARCHITECT IN WRITING PRIOR TO PROCEEDING WITH THE WORK.



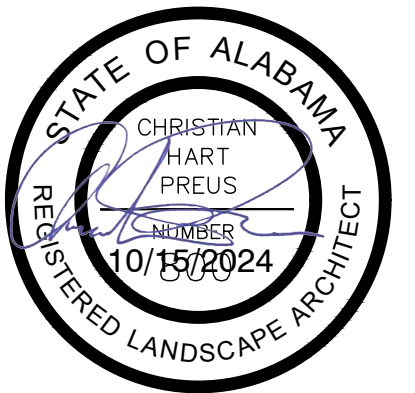
REFERENCE NOTES SCHEDULE										
01 GENERAL		QTY	DETAIL							
01-01	ADA PARKING SIGN	7	8H200							
01-02	ADA PARKING - SEAL COAT & RE-STRIPE PER ALDOT STANDARDS	2,197 SF	8H200							
03 CONCRETE		QTY	DETAIL	CONCRETE THICKNESS	MATERIAL MIX	FINISH	REINFORCEMENT	CONTROL JOINT	EXPANSION JOINT	ADDITIVES
03-02	NEW CONCRETE PAVING	4,313 SF	1H200	4"	4000 PSI	PER DETAIL	PER DETAIL	PER DETAIL	PER DETAIL	N/A
03-03	CONCRETE CURB	99 LF	8"	8" CURB	4000 PSI	PER DETAIL	PER DETAIL	PER DETAIL	PER DETAIL	N/A
03-08	NEW CONCRETE PAVING (ALTERNATE)	629 SF	1H200	4"	4000 PSI	PER DETAIL	PER DETAIL	PER DETAIL	PER DETAIL	N/A
03-08	CONCRETE CHECK WALL	7 LF	7H200	PER DETAIL	3500 PSI	SMOOTH TROWEL	PER DETAIL	PER DETAIL	PER DETAIL	N/A
03-09	CAST-IN-PLACE STAIRS	16 LF	7H200	PER DETAIL	PER DETAIL	LIGHT BROOM	PER DETAIL	PER DETAIL	PER DETAIL	N/A
SITE FURNISHINGS		QTY	DETAIL							
S-101	CONCRETE BENCH (CIP)	4	11H200							

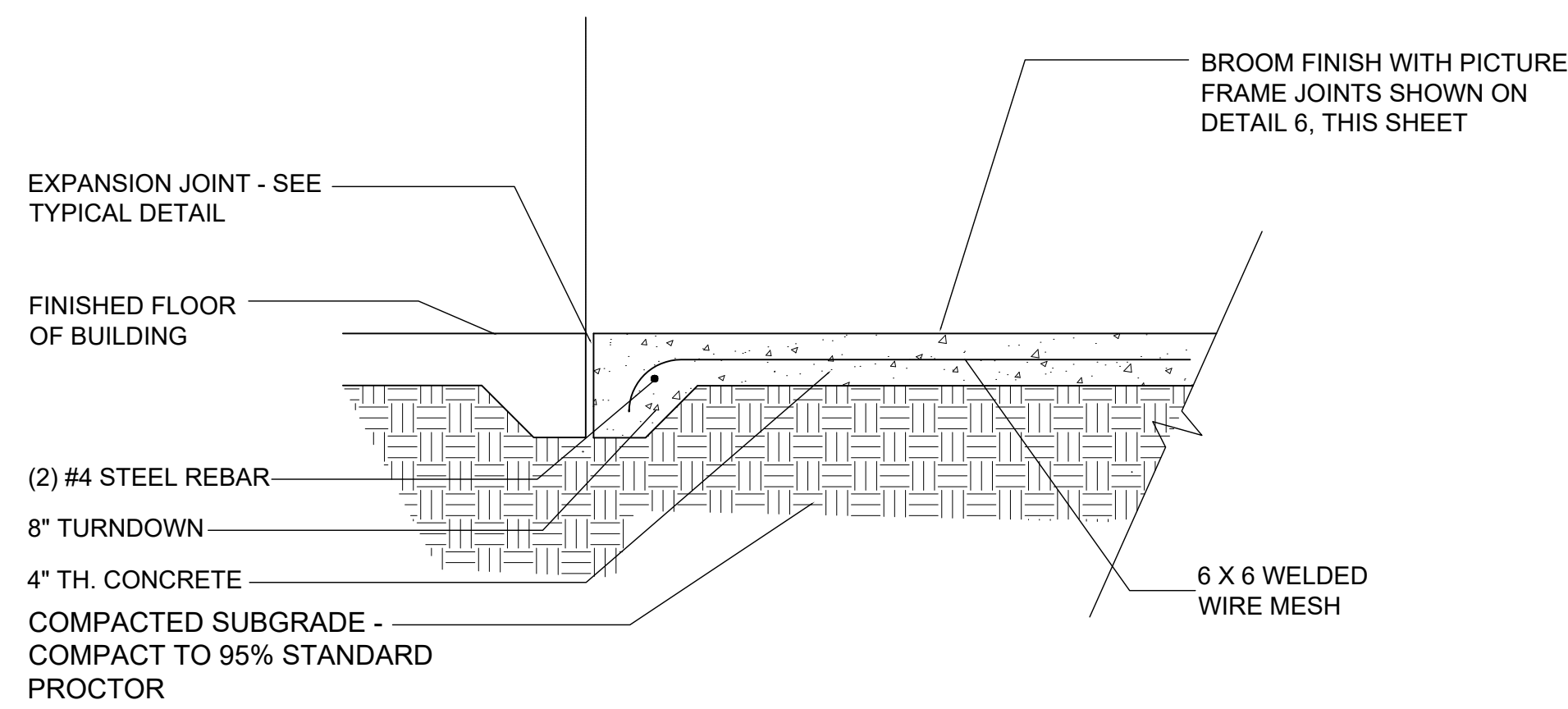


01 HARDSCAPE ENLARGEMENT & LAYOUT (ALTERNATE)
1" = 10' - 0"

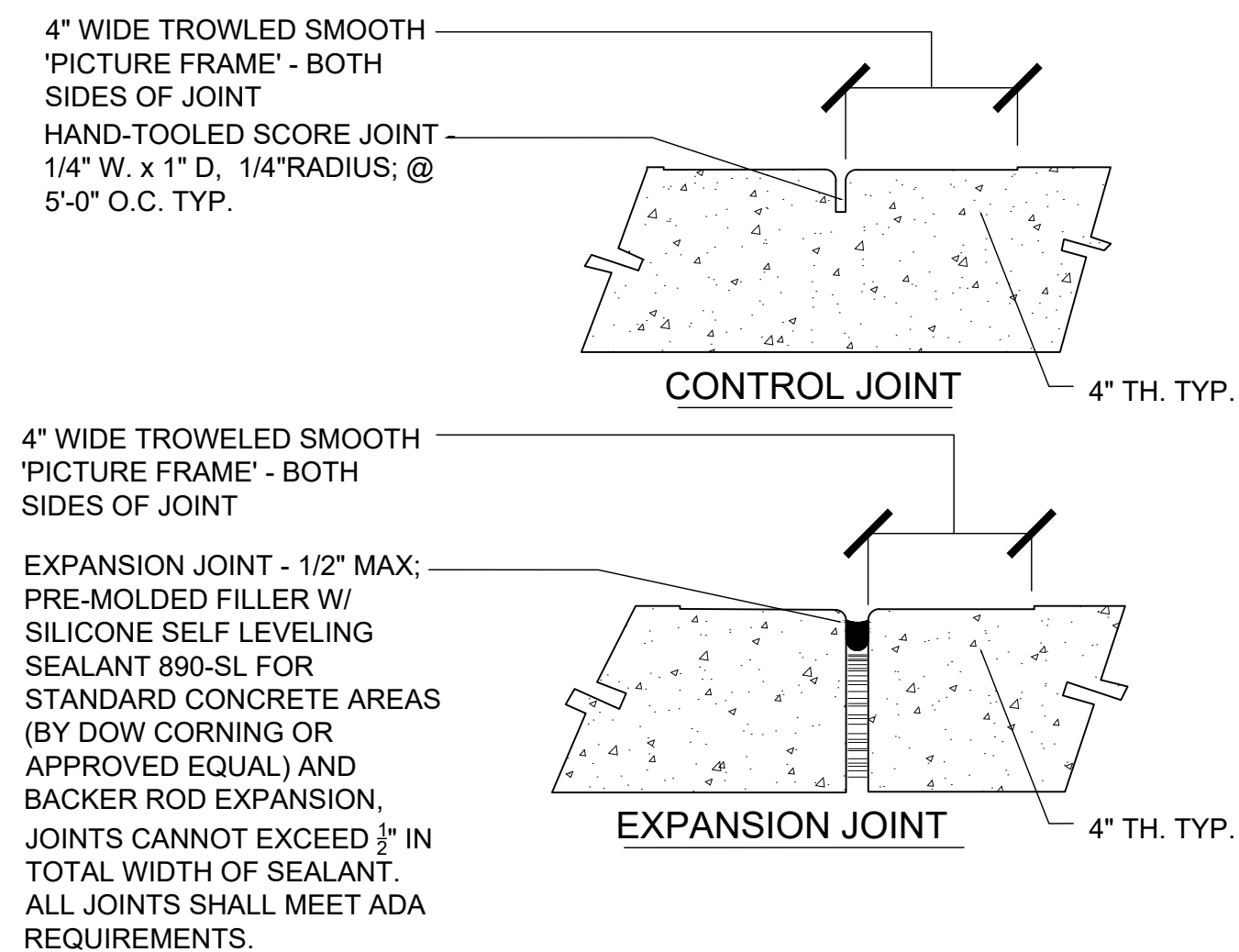


02 HARDSCAPE ENLARGEMENT & LAYOUT (BASE BID)
1" = 10' - 0"

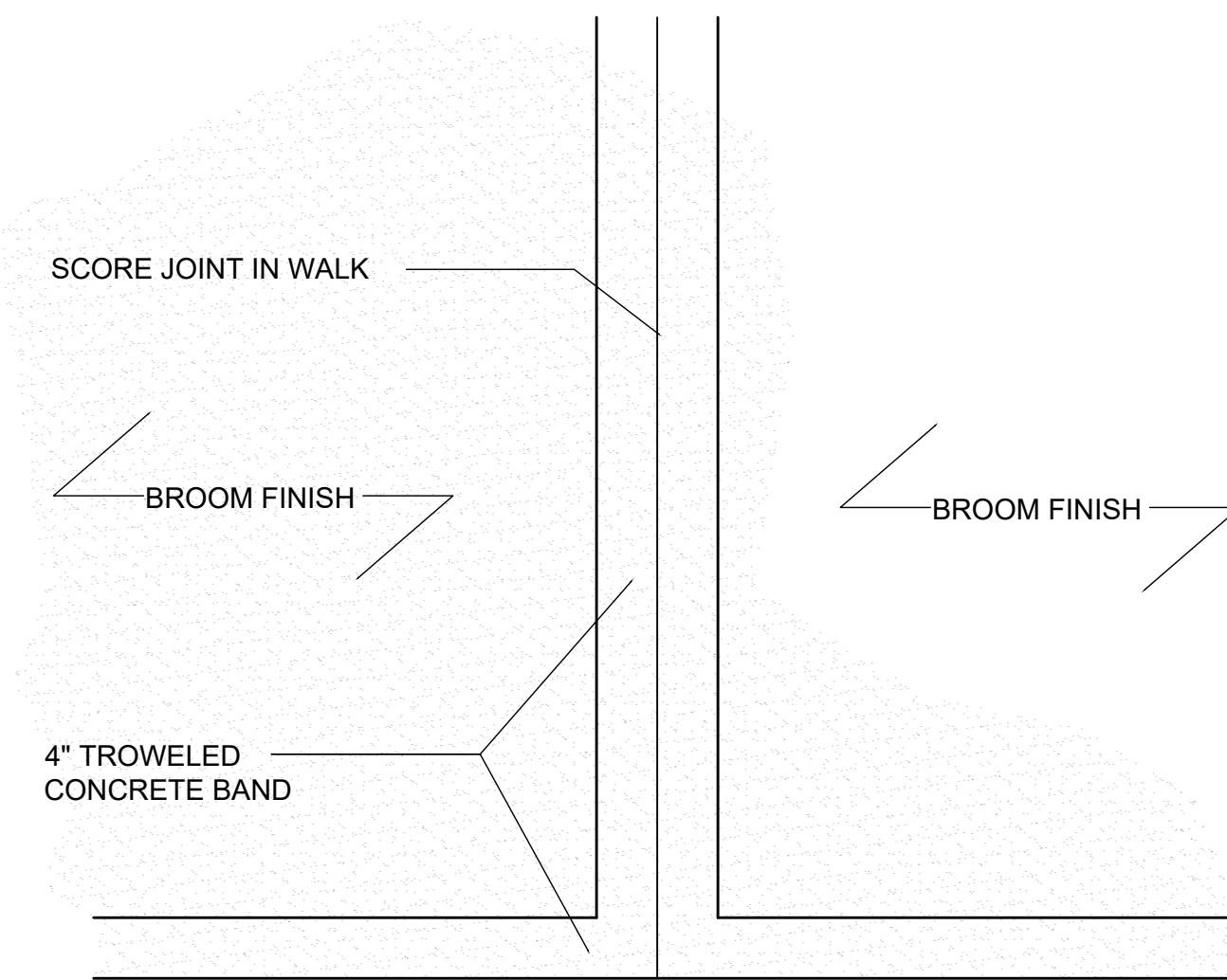




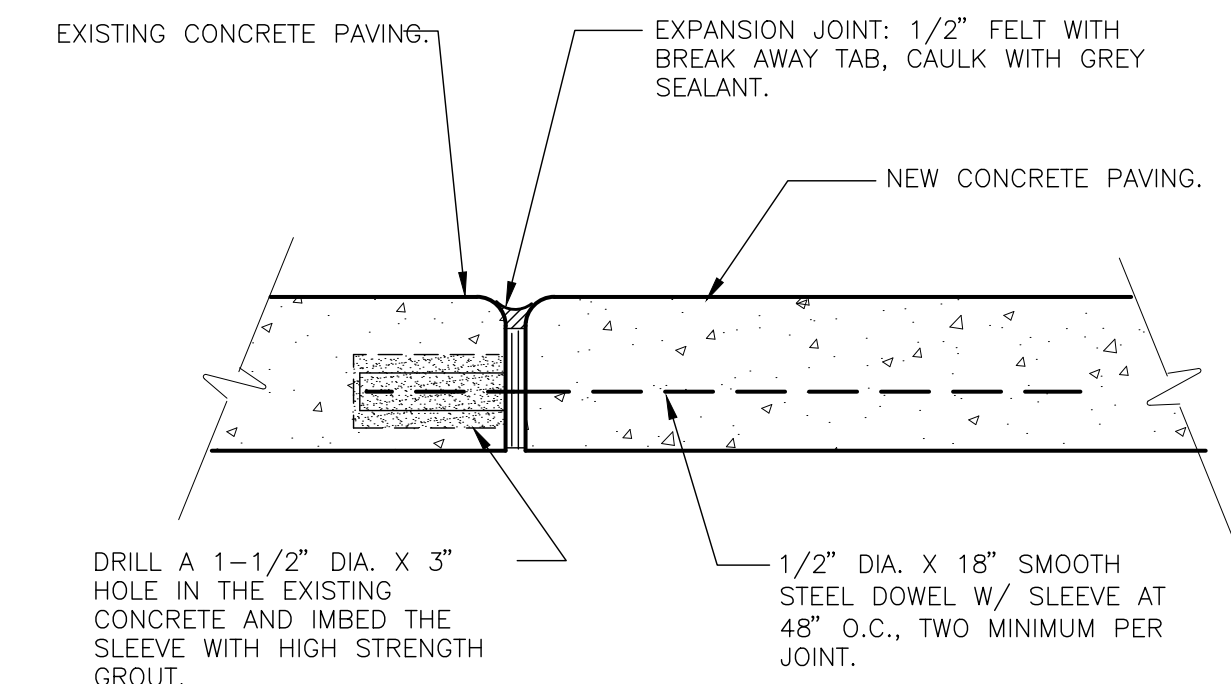
1 CONCRETE WALK SECTION
NOT TO SCALE P-CP-CP-01



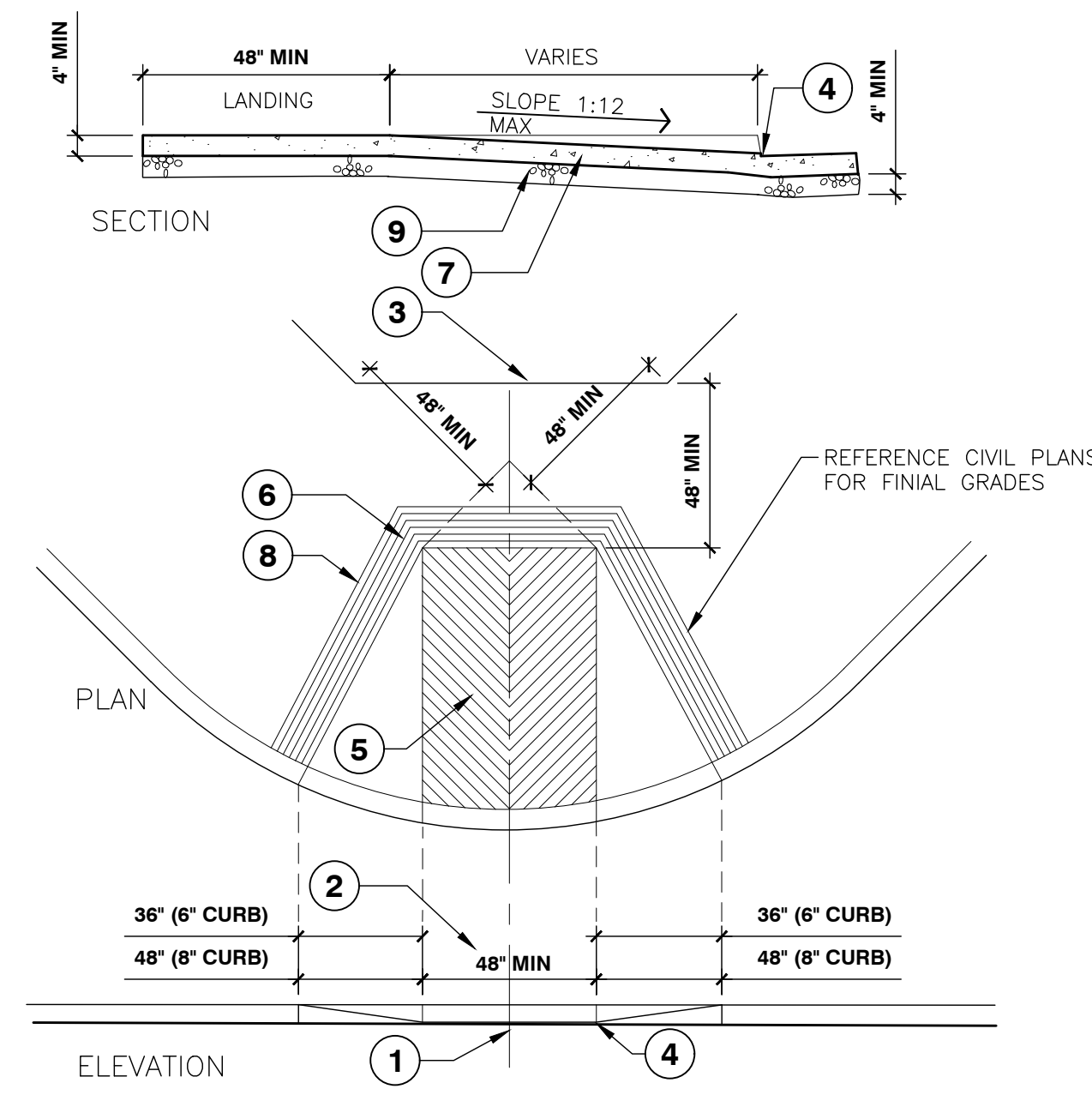
2 TYPICAL SIDEWALK CONCRETE JOINTS
NOT TO SCALE P-CP-CP-02



3 TROWELED FRAME & SCORE JOINTS
NOT TO SCALE P-CP-CP-05

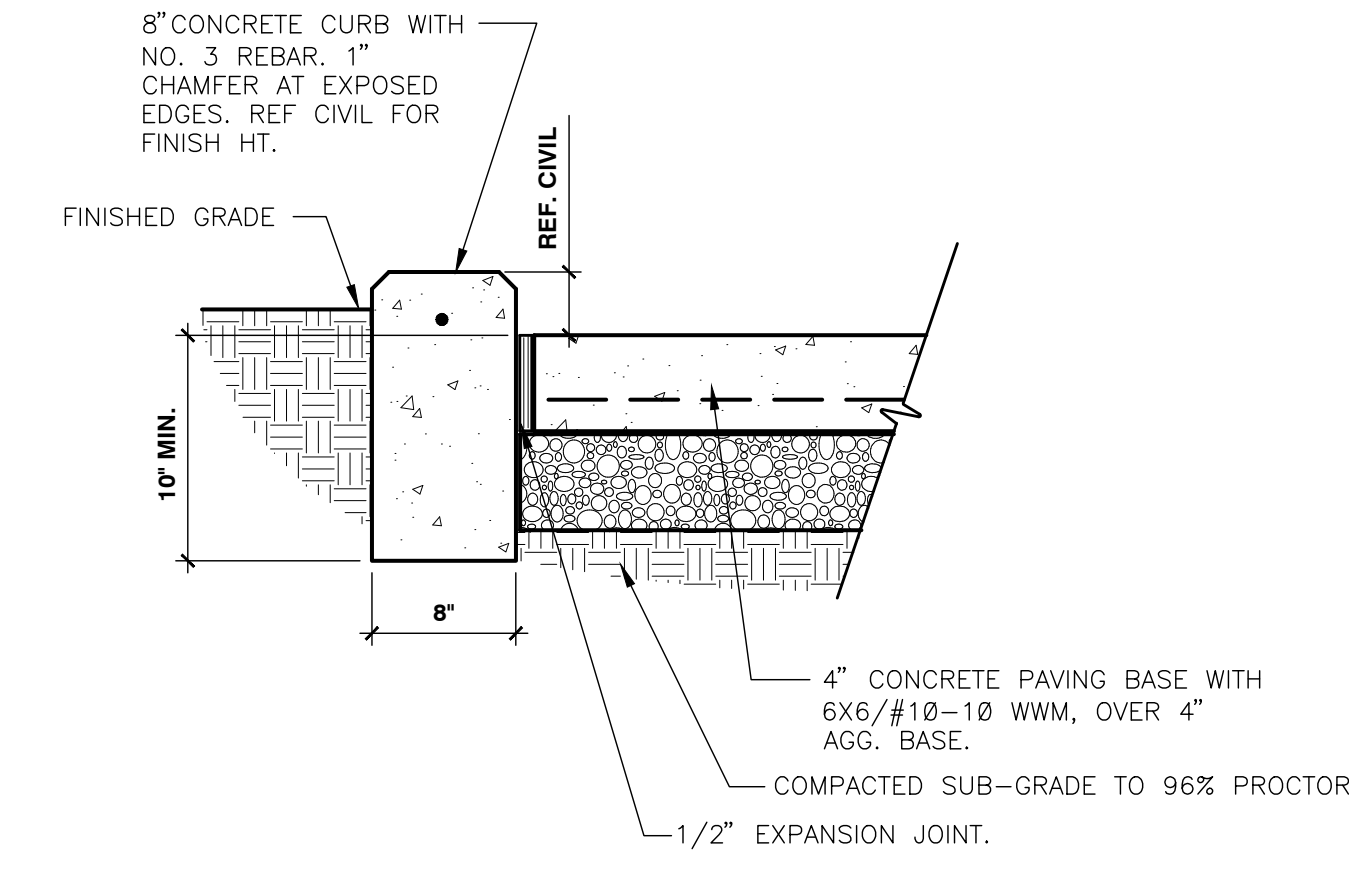


4 CONCRETE JOINT AT EXISTING PAVING
NOT TO SCALE FX-SI-FX-PAV-06

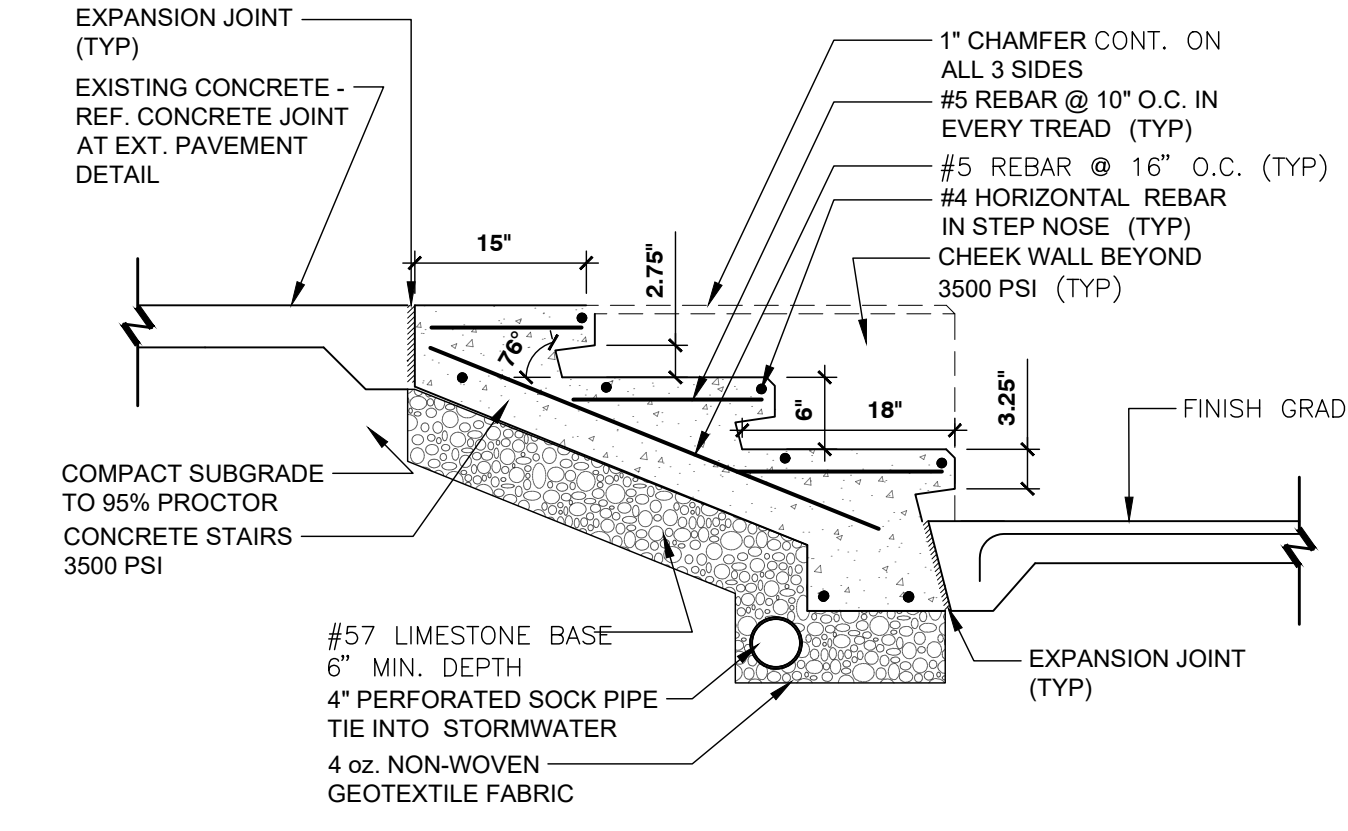


- 5 SIDEWALK HANDICAP RAMP**
1/4" = 1'-0"
- RAMP LOCATION SHALL BE AT THE MIDDLE OF THE CURB RETURN.
 - RAMP WIDTH SHALL BE A FLAT PLANE WITH NO CROSS SLOPE, A MINIMUM OF 48" WIDE AT THE REAR AND A MINIMUM OF 48" WIDE AT THE CURB EDGE. SLOPE OF RAMP WIDTH SHALL BE A STRAIGHT GRADE FROM THE TOP OF THE 1/2" LIP AT THE GUTTER TO THE REAR OF THE RAMP. SLOPE OF RAMP WIDTH SHALL NOT EXCEED 1" RISE PER 12" OF RUN. SLOPE OF RAMP SIDES SHALL NOT EXCEED 1" RISE PER 5" RUN.
 - A SIDEWALK LANDING OF 48" DEEP MINIMUM SHALL BE PROVIDED AT THE REAR OF THE RAMP. THE BOTTOM OF THE RAMP SHALL HAVE A 1/2" LIP AT A 45 DEGREE ANGLE.
 - THE CENTRAL PORTION OF THE RAMP SHALL BE GROOVED IN A HERRINGBONE PATTERN WITH 1/4" GROOVES APPROXIMATELY 1 1/2" O.C.. SEE GROOVING ENLARGEMENT. GROOVES SHOULD BE ALIGNED PARALLEL TO CROSSWALK STRIPES TO DIRECT PEDESTRIANS INTO APPROPRIATE CROSSWALK.
 - THE RAMP SHALL HAVE A 1/2" WIDE BORDER WITH 1/4" GROOVES APPROXIMATELY 3/4" O.C. SEE GROOVING ENLARGEMENT.
 - DOWELS AT EXPANSION JOINTS SHALL BE 1/2" SMOOTH BARS, 18" LONG.
 - CLASS 3 AGGREGATE BASE, 4" MIN. DEPTH UNLESS OTHERWISE SPECIFIED.

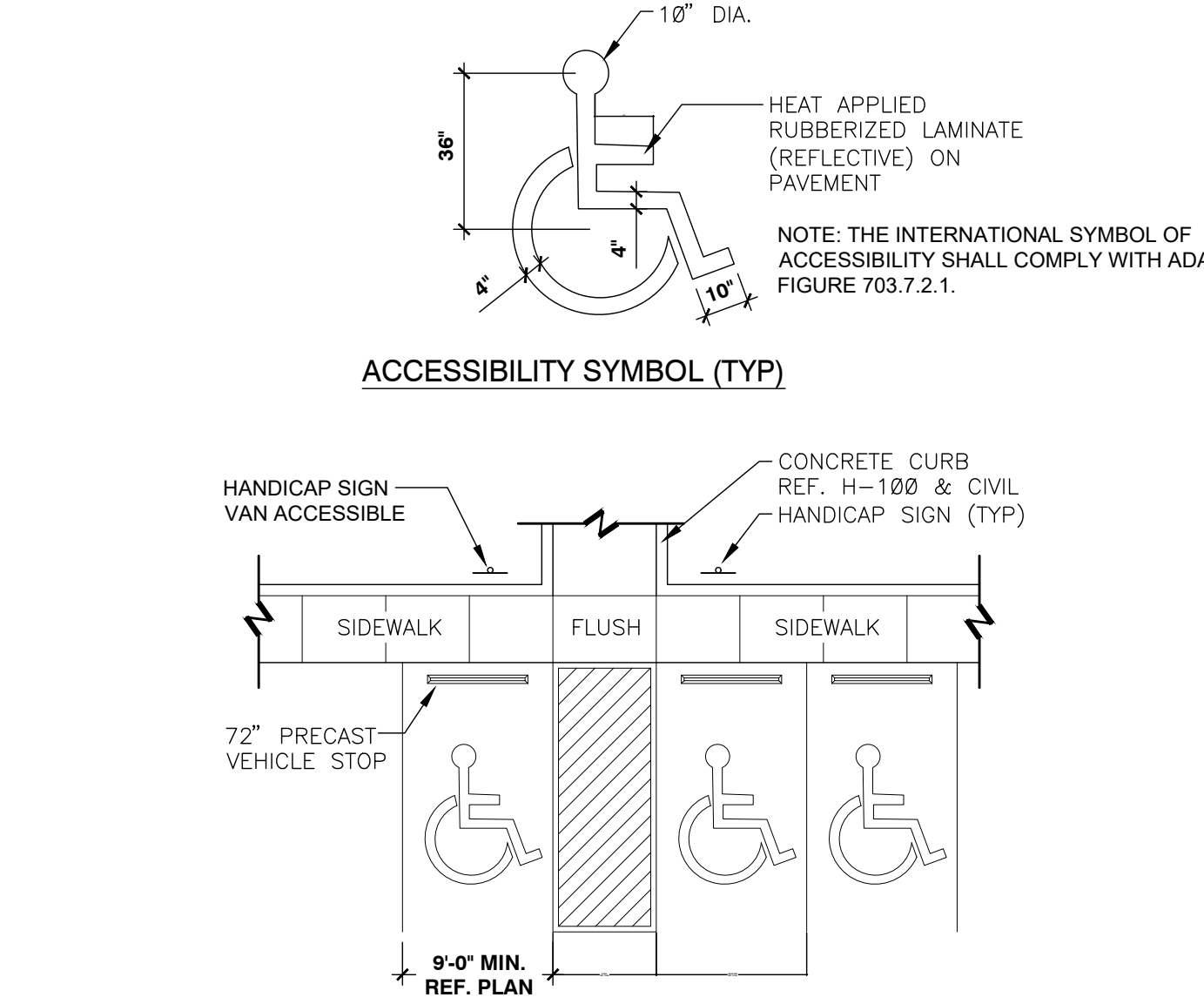
5 SIDEWALK HANDICAP RAMP
1/4" = 1'-0" P-CP-ADA-04



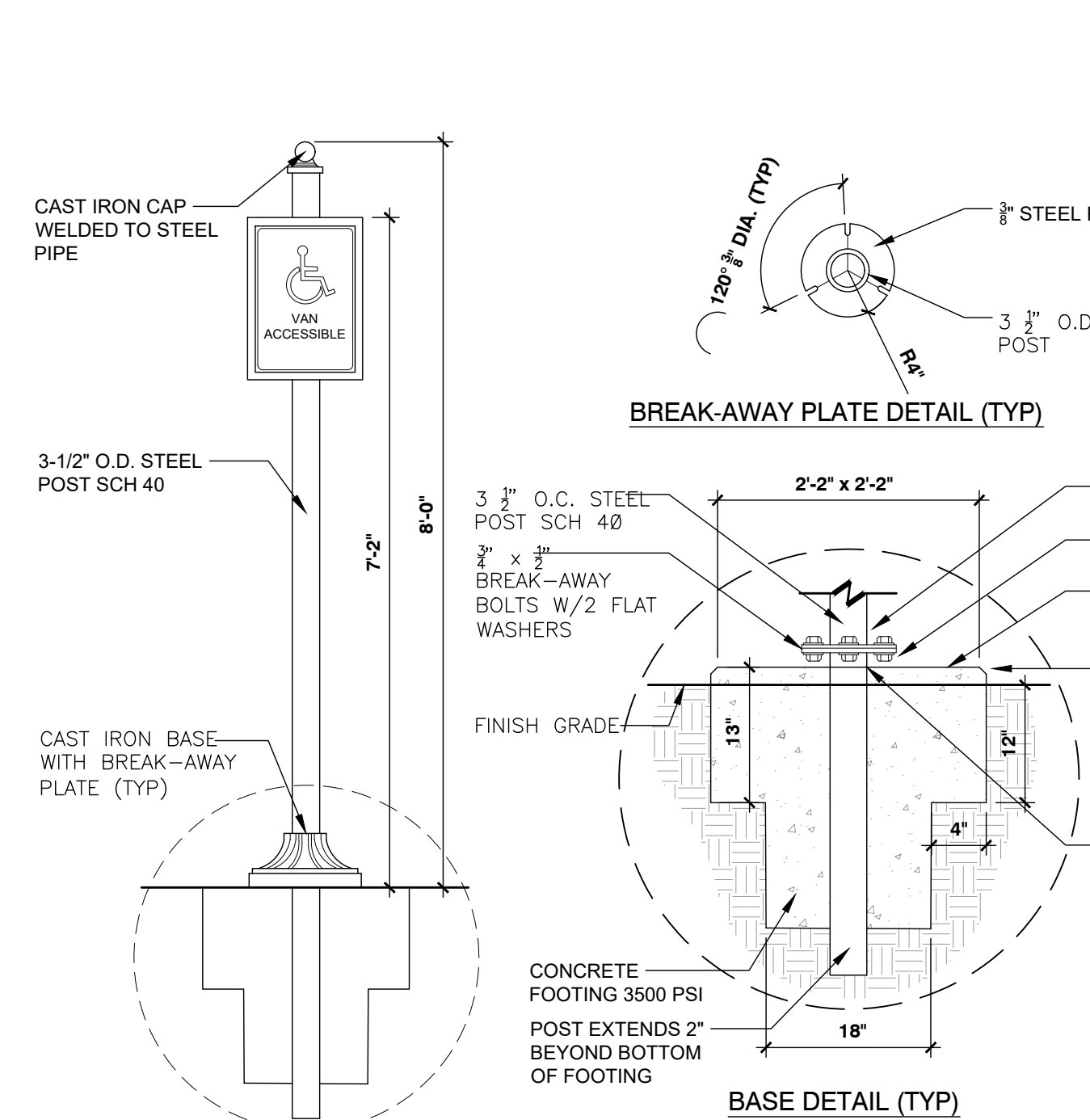
6 CONCRETE CURB AT SIDEWALK
NOT TO SCALE P-CP-CC-01



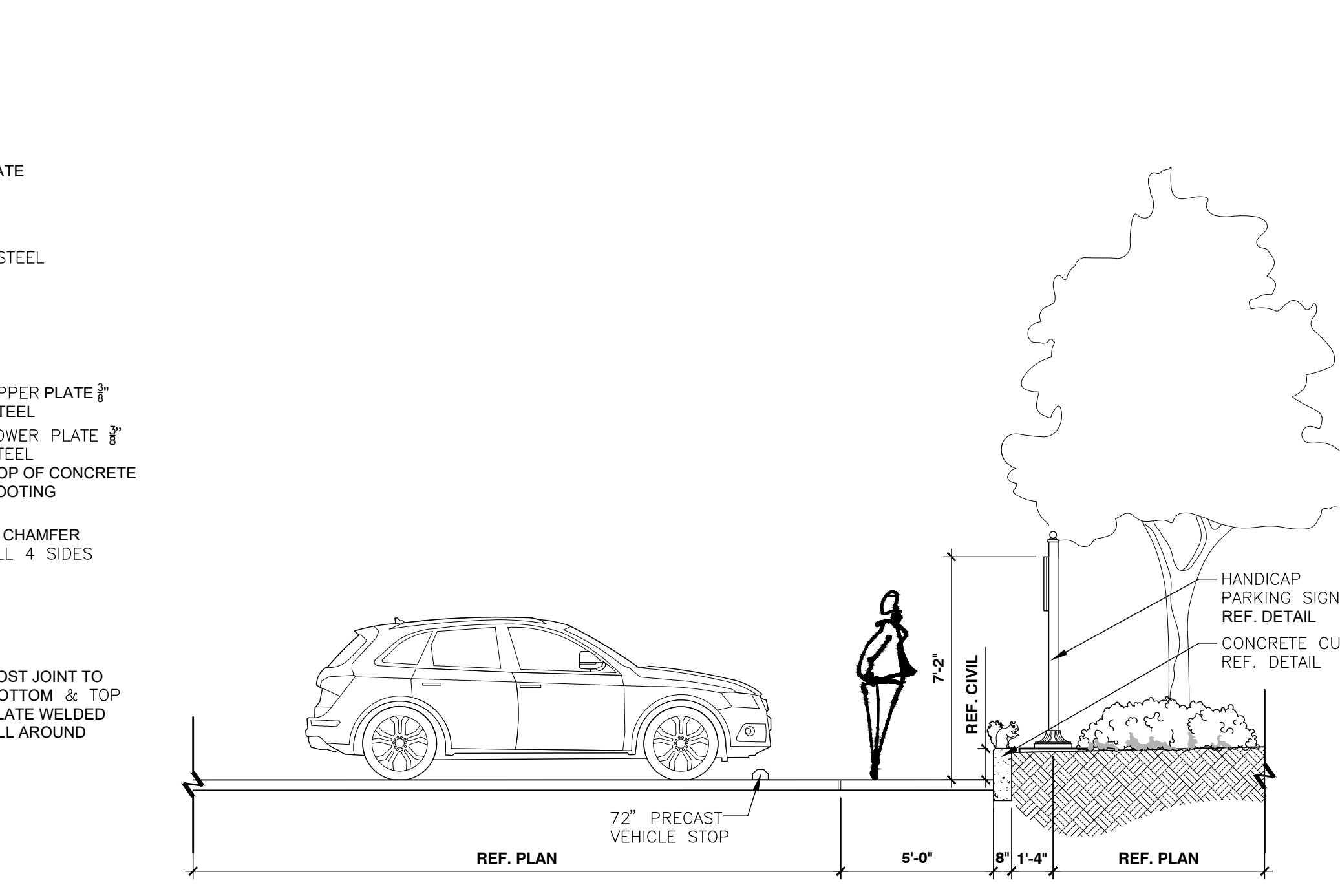
7 CAST-IN-PLACE STEPS WITH CHEEK WALL
NOT TO SCALE P-CP-STAIR-17



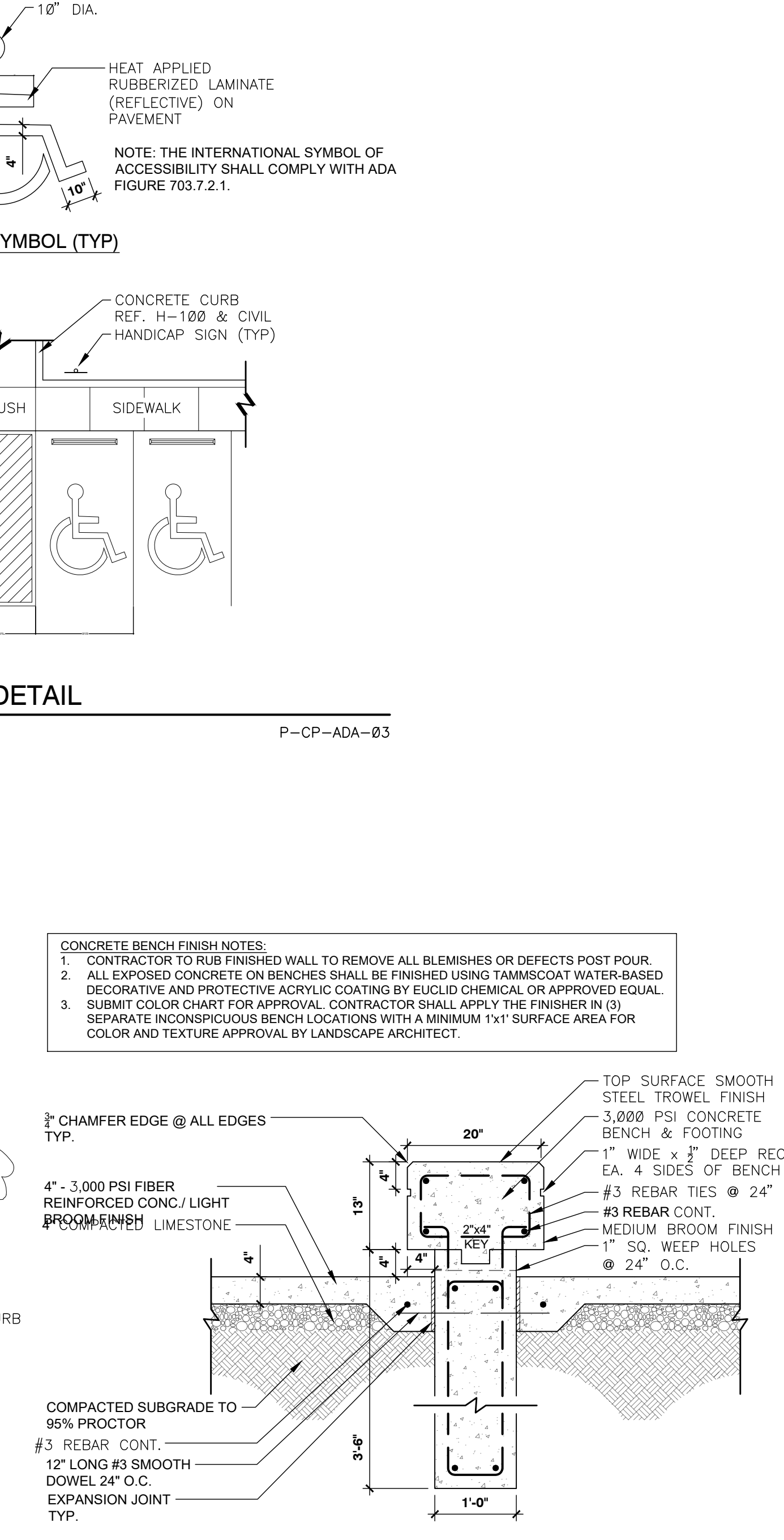
8 HANDICAP PARKING DETAIL
NOT TO SCALE P-CP-ADA-03



9 HANDICAP PARKING SIGN DETAIL
NOT TO SCALE P-CP-ADA-04



10 SIDEWALK @ ADA PARKING SECTION
NOT TO SCALE P-CP-ADA-05



11 6' CONCRETE BENCH DETAIL - (CIP)
NOT TO SCALE P-CO-COM-01

