ADDENDUM NO. 2

FOR

CAESARS LANE WWTP EXPANSION PHASE 1
CDBG-DR
FEDERAL CONTRACT NUMBER B-12-UT-36-0001

TOWN OF NEW WINDSOR
ORANGE COUNTY, NEW YORK

CLIENT:
Town of New Windsor
555 Union Ave
New Windsor, NY 12553

PREPARED BY:
MHE Engineering, D.P.C.
33 Airport Center Dr., Suite 202
New Windsor, NY 12553

Addition to this Document is a
Violation of Section 7209(2)
of the New York State Education Law.

DATE: 16 January 2025
JOB #: 18-732.1

THIS ADDENDUM CONSISTS OF NINETY-SIX (96) PAGES

NEW YORK OFFICE
33 Airport Center Drive, Suite 202, New Windsor, NY 12553
845-567-3100 | F: 845-567-3232 | mheny@mhepc.com

PENNSYLVANIA OFFICE
111 Wheatfield Drive, Suite 1, Milford, PA 18337
570-296-2765 | F: 570-296-2767 | mhepa@mhepc.com

CAESARS LANE WWTP EXPANSION PHASE 1
ADDENDUM NO. 2

Prospective Bidders are advised of the following revisions, additions and/or deletions to the contract documents.

1. **BID FORMS:**

   1.1 Replace Bid Form For Electrical Construction Contract (EC-1) – C-410 with Electrical Construction Contract (EC-1) – R1 – C-410-R1 (See clarifications (Section 5) of this addendum.

2. **SPECIFICATIONS (SEE LIST OF ATTACHMENTS):**

   2.1 Replace Specification 061600 – R1 – Sheathing – R1 with 061600 – R2 – Sheathing – R2.
   2.2 Replace Specification 076200 – Sheet Metal Flashing and Trim with 076200 – R1 – Sheet Metal Flashing and Trim – R1.
   2.3 Replace Specification 084113 – Aluminum-Framed Entrance and Storefronts with 084113 – R1 – Aluminum-Framed Entrance and Storefronts - R1.
   2.4 Replace Specification 085113 – Aluminum Windows with 085113 – R1 – Aluminum Windows – R1.
   2.5 Replace Specification 087100 – Door Hardware with 087100 – R1 – Door Hardware – R1.
   2.6 Replace Specification 088000 – Glazing with 088000 – R1 – Glazing – R1.
   2.7 Replace Specification 114000 – Kitchen Equipment with 114000 – R1 – Kitchen Equipment – R1.
   2.8 Replace Specification 115313 – Laboratory Fume Hoods with 115313 – R1 – Laboratory Fume Hoods – R1.

3. **PLAN SET:**

   3.1 Replace Plan Sheet A-901 dated 21 November 2024 with Plan Sheet A-901 dated 16 January 2025
   3.2 Replace Plan Sheet A-903 dated 21 November 2024 with Plan Sheet A-903 dated 16 January 2025
   3.3 Replace Plan Sheet A-904 dated 21 November 2024 with Plan Sheet A-904 dated 16 January 2025
   3.4 Replace Plan Sheet A-905 dated 21 November 2024 with Plan Sheet A-905 dated 16 January 2025
   3.5 Replace Plan Sheet A-906 dated 21 November 2024 with Plan Sheet A-906 dated 16 January 2025
   3.6 Replace Plan Sheet A-907 dated 21 November 2024 with Plan Sheet A-907 dated 16 January 2025
   3.7 Replace Plan Sheet A-908 dated 21 November 2024 with Plan Sheet A-909 dated 16 January 2025

4. **RFI'S:**

   4.1 Question: *Division 01 - (Reference EJCDC® C-700, Standard General Conditions of the Construction Contract; Article 6- Bonds and Insurances; Paragraph 6.04); Please confirm the Owner will provide the Builder's Risk Insurance Policy as there are multiple prime contracts on the project.*

   Response: Each contractor is responsible for providing their own Builder's Risk Policy.

   4.2 Question: *Division 01 - Please provide information regarding the anticipated timeline for the project, specifically the planned start date?*

   Response: Bids will be publicly opened on January 23rd. Bids will then be evaluated and, if acceptable, the Town will look to award the contracts at a subsequent Town Board meeting. The expectation is

that construction work would begin in March or April after bonds/insurances are submitted and contracts are signed. The contract time is 450 days to substantial completion as stated in the C-520 Agreement document.

4.3 Question: *Division 02 - Please reference AD-701 and specify the components of the incinerator equipment that need to be removed.*

Response: See Note #4 on Sheet AD-701. The existing incinerator structure and all associated components shall be removed in their entirety. This includes but is not limited to all attached and connecting pipes, conduit, wiring, roof penetrations, and raised foundation pad.

4.4 Question: *DIVISION 06 - Please reference spec 072100 - Foamed-In-Place Insulation is included in the specifications but not included on the drawings. Please clarify.*

Response: The Foamed-In-Place Insulation is for use to fill voids at shim spaces surrounding doors, windows, louvers, etc.

4.5 Question: *DIVISION 08 - Please reference Spec 088000 – Paragraph 2.2.C – Windborne-Debris Impact Resistance Please clarify if this is required for insulated glass at exterior entrance doors and aluminum windows*

Response: No that is not required. See revised specification attached.

4.6 Question: *DIVISION 08 - Please reference Spec 084113 – Performance Requirements Please clarify if Windborne- Debris Impact Resistance is required for storefront framing/entrance doors. It is not referenced in 084113 however, it is referenced in spec 088000.*

Response: No that is not required. The specification has been revised with a basis of design.

4.7 Question: *DIVISION 08 - Please reference Spec 085113 – Products There is no specified Basis of Design for aluminum windows. Please confirm that these fixed windows can be built with storefront material.*

Response: The specification has been revised to provide a basis of design.

4.8 Question: *Please provide Engineers estimate for EC contract for our Bid Bond request form?*

Response: We typically do not provide this during the bid period so as to not influence public bid prices.

4.9 Question: *Please provide milestone schedule, start/end date, none found on documents?*

Response: Bids will be publicly opened on January 23rd. Bids will then be evaluated and, if acceptable, the Town will look to award the contracts at a subsequent Town Board meeting. The expectation is that construction work would begin in March or April after bonds/insurances are submitted and contracts are signed. The contract time is 450 days to substantial completion as stated in the C-520 Agreement document.

4.10 Question: *Is there a site visit scheduled, if not can we schedule a site visit?*

Response: A pre-bid meeting was held on January 7, 2025 at 10am at the project site as stated in the C-111 Advertisement for Bid document.

4.11 Question: *Is the EC responsible for its own excavation/trenching/duct bank work? or is the GC responsible?*

Response: Yes, the Electrical Contractor is responsible for all their own excavation/trenching/duct bank work.

4.12 Question: *Who is the site fire alarm vendor we need to contact for pricing, or can we use anyone?*

Response: The Town's vendor is D-Ben. Allowance is stated in the revised bid form.

4.13 Question: *Is this project HUD funded and falls under the regulations of section 3.*

Response: Yes, this project is HUD funded and regulations of Section 3 apply.

4.14 Question: *DIVISION 05 - Drawing 1/A-904 notes 6" cold formed metal framing at 16" O.C. and drawing 2/S-905 notes metal studs to be at 24" O.C. Please confirm which measurement is correct.*

Response: The metal studs will be spaced at 24-inch O.C. to coordinate with truss locations and the wall section on drawing A-904 shall be revised as such. Wall Type Detail A on drawing A-901 shall also be changed to 24-inch O.C.

4.15 Question*: DIVISION 05 - Please reference drawing 1/A-904. There is a note that mentions "continuous exterior wall sheathing – see specs" but in the specifications three different types of wall sheathing are called out (plywood sheathing, paper surfaced sheathing and glass-mat gypsum sheathing. Please clarify what sheathing is required on the exterior walls*.

Response: The specification has been revised. See attached.

4.16 Question: *DIVISION 07 - Please reference 2/A-902 and clarify the 1x6 fascia material. Is this wood fascia board wrapped in metal or a metal panel. Please also where this would be located in the specifications.*

Response: It is a wood fascia wrapped in metal. Metal finish and color are to match roofing. Please refer to specification 076200 Sheet Metal Flashing and Trim.

4.17 Question: *DIVISION 10 - Addendum #1 notes an add of Cubicle Curtains and Track but it is not apparent on the drawings at any location. Please clarify where this is located.*

Response: Cubical tracks and curtains will be installed in the showers and changing areas. Drawings A-905 & A-908 are revised, attached.

4.18 Question: *DIVISION 11 – Kitchen Equipment reference a microwave but there is no microwave seen on the drawings.*

Response: The microwave has been removed from the kitchen equipment specification.

4.19 Question: *DIVISION 12 – Please reference the laboratory equipment specifications. Please clarify if the equipment noted in this section is install only or furnish and install?*

Response: The laboratory equipment identified on Sheet A-906 will be furnished and installed by the respective contractors.

4.20 Question: *DIVISION 12 – Please reference the laboratory equipment specifications. Item E is noted as "Acid/ Corrosive Storage Cabinets" but the lab equipment schedule on A-906 includes separate items for Acid Cabinets and Corrosive Cabinets. Please clarify if the G.C. is responsible for one or two cabinets. Please also clarify the model number if the lab equipment items are not the same.*

Response: The specification is correct. The equipment schedule has been revised. See attached.

4.21 Question: *DIVISION 12 – Please reference Lab Equipment schedule on A-906. Equipment item E-11 "Safety Shower & Eye Wash" line items includes a note to see P-DWGS & Specs. Please confirm who this will be required by.*

Response: Plumbing Contractor is responsible for furnish and install. The equipment schedule on A-906 has been revised.

4.22 Question: *Bid form break out LS-3 for EC contract, only demolition work cost goes here correct. All other dewatering building work goes in LS-2 correct?*

Response: LS-2 is for the control building. There is no work other than demolition in the Dewatering Building in this contract.

4.23 Question: *Provide location of new TR1, not shown on plans, where in the dewatering building are we installing this?*

Response: Install within electrical / pump control room adjacent to MCC 5 shown on the electrical site plan – new work on Sheet E-100. Coordinate final location in field with owner. FYI. Location is not critical here, as this is just a temporary source of power until the new service is brought on-line during Phase 2. This transformer will be removed after Phase 2 is complete.

4.24 Question: *DB-01 shows fiber in 4" C from data rack to handhole HH-3C, provide location of data rack?*

i. *Are we responsible for the termination/testing of the fiber cable?*
ii. *Can you provide specs for fiber cable, none included in spec book provided*

Response: Locate the fiber optic patch panel specified on sheet e-031 electrical details (typical data riser diagram detail) within the electrical / pump control room adjacent to mcc 5 shown on the electrical site plan – new work on sheet e-100. Coordinate final location in field with owner. Again, this is just a temporary location until phase 2 is complete. Location is not critical here.

i. Yes. This is specified on sheet e-031 electrical details. Refer to sheet key note 13 of the typical data riser diagram detail.
ii. The fiber optic cable is specified on sheet e-031 electrical details. Refer to sheet key note 12 of the typical data riser diagram detail.

4.25 Question: *Please clarify where concrete encasement would be required for DB-01 and DB-02, drawings do not call out where sand fill vs concrete encased would be required?*

Response: Please refer to the electrical site plan – new work on Sheet E-100. Sand filled duct banks are delineated by uge, while reinforced concrete duct banks are delineated by ruge and are hatched. This notation is specified on Sheet E-001 and shown on Sheet E-100. Additionally, these requirements are specified in the duct bank schedule on Sheet E-040.

4.26 Question: *Please provide detail of existing MCC Board for new Bucket/Breaker pricing. We need Model/Manufacturer/etc, al information on name plate.*

Response: All known / required nameplate ratings and information was provided on the electrical new work single line diagrams on Sheet E-010. The MCC is a Square D Model 4.

4.27 Question: *DIVISION 06 – Please refer to Specification Section 062023 – Interior Finish Carpentry. While the specifications mention interior trim, it is not shown on the drawings. Please confirm that no interior trim is required.*

Response: See revised Drawing A-907 for revised window details and exterior door details, indicating wood trim.

4.28 Question: *DIVISION 06 – Please refer to Specification 061600 in Addendum #1, which specifies Glass Mat Sheathing for roofing sheathing. However, Drawing A-904 indicates 5/8" CDX plywood. Confirm which material is required.*

Response: The only roof sheathing specified in Addendum 1, Specification 061600 – R1 is plywood; however, the specification has been revised and re issued to eliminate any language that may have been confusing.

4.29 Question: *DIVISION 31 – Please refer to Specification Section 31233-3, Article 1.9. While there are no boring tests within the building footprint, the specifications require unclassified excavation. Please confirm whether rock removal will be billed as an additional cost per the unit rates provided in the bid form documents, or if this scope of work is included in our base contract.*

Response: The quantity of rock in the contingency item is approximated for the entire Phase 1 scope. NO rock removal is in the Lump Sum.

4.30 Question: *DIVISION 31 – Please refer to drawings C-101, which include a note stating, "Area cleared under separate contract (stumps remain)." Please specify the number of stumps that will remain to allow for accurate pricing.*

Response: Area to have stumps removed shall be limited to the extents of constructing the new control building, retaining wall, site work improvements and contractor staging.

5. **CLARIFICATIONS:**

5.1 The owner has selected the use of their vendor (D-Ben Security Systems, Inc) for supplying the security access control, cameras and fire alarm system. The cost is provided in the allowance section of the Bid Form For Electrical Construction Contract (EC-1) – R1 and shall be included in the electrical bid. The allowance includes the equipment cost ONLY. Installation is to be performed by the contractor and included within their base bid. To clarify, the fire alarm system, control panel, and all associated equipment, components, and devices (horns, strobes, pull stations, smoke detectors, heat detectors, carbon monoxide detectors, annunciators, control relays, power supplies, etc…), and security system (access control equipment and cameras) as shown on the contract drawings are to be furnished (supplied) by the owner's preferred vendor (D-Ben Security Systems, Inc) thru the allowance stated above. The contractor is responsible for all circuitry (conduit and conductors) between devices as shown and specified on the contract drawings, as well as the installation and termination of these devices per the manufacturer's requirements and included in their base bid.

ATTACHMENTS:

1. Specification 061600 – R2 - Sheathing – R2
2. Specification 076200 – R1 – Sheet Metal Flashing and Trim – R1
3. Specification 084113 – R1 – Aluminum-Framed Entrance and Storefronts - R1
4. Specification 085113 – R1 – Aluminum Windows – R1
5. Specification 087100 – R1 – Door Hardware – R1
6. Specification 088000 – R1 – Glazing – R1
7. Specification 114000 – R1 – Kitchen Equipment – R1
8. Specification 115313 – R1 – Laboratory Fume Hoods – R1
9. Bid Form For Electrical Construction Contract (EC-1) – R1 – C-410-R1
10. Plan Sheet A-901 dated 16 January 2025
11. Plan Sheet A-903 dated 16 January 2025
12. Plan Sheet A-904 dated 16 January 2025
13. Plan Sheet A-905 dated 16 January 2025
14. Plan Sheet A-906 dated 16 January 2025
15. Plan Sheet A-907 dated 16 January 2025
16. Plan Sheet A-908 dated 16 January 2025

ALL BIDDERS MUST SUBMIT ACKNOWLEDGEMENT OF RECEIPT OF ALL ADDENDUMS WITH BID (PAGE 8 – A2 ATTACHED HEREIN)

CAESARS LANE WWTP EXPANSION PHASE 1
ADDENDUM NO. 2

ACKNOWLEDGEMENT OF RECEIPT OF ALL ADDENDUMS LISTED BELOW:

ADDENDUM NO. 2 – 16 January 2025 _____

SUBMIT THIS SHEET WITH YOUR BID

(End of Addendum No. 2)

MHE Engineering, D.P.C.
33 Airport Center Drive, Suite 202
New Windsor, NY 12553

BID FORM FOR ELECTRICAL CONSTRUCTION CONTRACT (EC-1) – R1

CAESARS LANE WWTP EXPANSION PHASE 1

The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders.

ARTICLE 1—OWNER AND BIDDER

1.01 This Bid is submitted to: **Town of New Windsor, 555 Union Avenue, New Windsor, NY 12553**

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2—ATTACHMENTS TO THIS BID

2.01 The following documents are submitted with and made a condition of this Bid:

A. Required Bid security;

B. Required Bidder Qualification Statement with supporting data (Instructions to Bidders – Article 3);

C. Wicks Law Form;

D. MBE-WBE-Section 3 Contract Solicitation and Commitment Statement;

E. Disclosure of Prior Non-Responsibility Determinations;

F. Iran Divestment Act Certification;

G. Non-Collusion Certification;

H. Certification Regarding Lobbying;

I. Sexual Harassment Prevention Certification;

J. Prime Contractor Certification of Nonsegregated Facilities;

K. Bidder's Certification of Limited Foreign Involvement;

L. Debarment and Suspension Certification;

M. Section 3 Requirements Section A Intent to Comply and Review of Requirements Sign Off Sheet.

ARTICLE 3—BASIS OF BID—LUMP SUM BID AND UNIT PRICES

3.01 Refer to Article 7 for Description of Bid Items.

3.02 *Lump Sum Bids*

A. Bidder will complete the Work in accordance with the Contract Documents for the following lump sum (stipulated) price(s), together with any Unit Prices indicated in Paragraph 3.02:

1. Lump Sum Price (Single Lump Sum)

Item No.	Description	Bid Amount
LS-1	General Conditions	$
LS-2	General Electrical Construction – Control Building	$
LS-3	General Electrical Construction – Dewatering Building Selective Demolition	$
Total of All Lump Sum Price Bid Items		$

B. Allowance - All specified cash allowance(s) are included in the price(s) set forth below, and have been computed in accordance with Paragraph 13.02 of the General Conditions.

Lump Sum For General Allowance	**$20,000.00**
Lump Sum For Security and Fire Alarm by Owner's Vendor (See Clarification Section 5 of Addendum 2)	**$26,000.00**
Total Lump Sum for Allowances	**$46,000.00**

3.03 *Total Base Bid Price (Lump Sum and Allowance)*

Total Base Bid Price (Total of all Lump Sum and Allowance)	$

ARTICLE 4—TIME OF COMPLETION

4.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Article 4 of the Contract for Construction of Small Project on or before the dates or within the number of calendar days indicated in the Agreement.

4.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 5—BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 *Bid Acceptance Period*

A. This Bid will remain subject to acceptance for 45 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

5.02 *Instructions to Bidders*

A. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

5.03 *Receipt of Addenda*

A. Bidder hereby acknowledges receipt of the following Addenda: **[Add rows as needed. Bidder is to complete table.]**

Addendum Number	Addendum Date

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Bidder's Representations*

A. In submitting this Bid, Bidder represents the following:

1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder's (Contractor's) safety precautions and programs.
7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data

are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

8. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

9. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

10. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

6.02 *Bidder's Certifications*

A. The Bidder certifies the following:

1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.

2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.

3. Bidder has not solicited or induced any individual or entity to refrain from bidding.

4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 8.02.A:

a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.

b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.

c. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.

d. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 7—DESCRIPTION OF BID ITEMS

7.01 *LS-1– General Conditions*

A. Including, but not limited to, submittals, coordination with Engineer, Owner, Utility Owners and private Property Owners, project layout, mark outs, mobilization, general restoration, clean up and demobilization, completion of work in accordance with the plans, details and specification in place, complete.

7.02 *LS-3 – General Electrical Construction – Dewatering Building Selective Demolition*

A. Selective demolition of electrical in general. Any wiring of circuit to be reviewed shall be removed back to the panel box.

BIDDER hereby submits this bid as set forth above:

Bidder:

_____

(typed or printed name of organization)

Bidder's F.E.I.N.:

Bidder's SAM.Gov. ID# or Proof of Registration (if applicable):

By: _____

(individual's signature)

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Date: _____

(typed or printed)

If Bidder is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.

Attest: _____

(individual's signature)

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Date: _____

(typed or printed)

Address for giving notices:

_____

_____

Bidder's Contact:

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Phone: _____

Email: _____

Address:

_____

_____

_____

Bidder's Contractor License No.: (if applicable):

SECTION 061600 – SHEATHING – R2

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wall sheathing.
2. Roof sheathing.
3. Parapet sheathing.
4. Composite nail base insulated wall sheathing.
5. Sheathing joint and penetration treatment.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.

1.3 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated plywood.
2. Fire-retardant-treated plywood.
3. Foam-plastic sheathing.

1.4 QUALITY ASSURANCE

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: As tested according to ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 PRESERVATIVE-TREATED PLYWOOD

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.

B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

C. Application: Treat items indicated on Drawings and plywood in contact with masonry or concrete or used with roofing, flashing, vapor barriers, and waterproofing.

2.3 FIRE-RETARDANT-TREATED PLYWOOD

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

1. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated.
2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201/D3201M at 92 percent relative humidity. Use where exterior type is not indicated.
3. Design Value Adjustment Factors: Treated lumber plywood shall be tested according to ASTM D5516 and design value adjustment factors shall be calculated according to ASTM D6305. Span ratings after treatment shall be not less than span ratings specified. For roof sheathing and where high-temperature fire-retardant treatment is indicated, span ratings for temperatures up to 170 deg F shall be not less than span ratings specified.

C. Kiln-dry material after treatment to a maximum moisture content of 15 percent.

D. Identify fire-retardant-treated plywood with appropriate classification marking of qualified testing agency.

2.4 WALL SHEATHING

A. Plywood Sheathing: DOC PS 1, Exposure 1, or Structural I sheathing.

2.5 ROOF SHEATHING

A. Plywood Sheathing: DOC PS 1, sheathing.

2.6 PARAPET / DORMER SHEATHING

A. Plywood Sheathing: DOC PS 1, sheathing.

2.7 COMPOSITE NAIL-BASE INSULATED WALL SHEATHING

A. Plywood-Surfaced, Polyisocyanurate-Foam Sheathing: ASTM C1289, Type V with DOC PS 2, Exposure 1 plywood on one face.

1. Basis of Design : Composite wall panels shall be Xci Ply as manufactured by Hunter Panels with a total thickness of 2.6 inches, with a thermal value of R=12.7 as per ASTM C518 with a compressive strength of 20 psi min. as per ASTM 1621, moisture vapor permeance of less than 1 perm, water absorption of less than 1% by volume as per ASTM C209, resistance to mold to pass ASTM D3272 and a dimensional stability of 2% linear change as per ASTM D2126. ubject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

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

   a. Atlas EPS; a Division of Atlas Roofing Corporation.
   b. Cornell Corporation.
   c. Dow Chemical Company (The).
   d. Johns Manville; a Berkshire Hathaway company.
   e. Rmax, Inc.

3. Polyisocyanurate-Foam Thickness: see description of Basis of Design.
4. Plywood Nominal Thickness: 5/8 inch.

2.8 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For roof parapet and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M.

2.9 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

A. Sealant for Composite Nail-Base Insulated Wall Sheathing: Fill gaps between panels with joint sealant compatible with joint substrates and other materials, recommended by sheathing manufacturer for application indicated.

B. Sheathing Tape for Foam-Plastic Sheathing: Pressure-sensitive plastic tape recommended by sheathing manufacturer for sealing joints and penetrations in sheathing.

2.10 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Wood Framing: Formulation complying with APA AFG-01 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

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

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
2. ICC-ES evaluation report for fastener.

D. Coordinate roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

1. Wall and Roof Sheathing:

a. Nail to wood framing. Apply a continuous bead of glue to framing members at edges of wall sheathing panels.
b. Screw to cold-formed metal framing.
c. Space panels 1/8 inch apart at edges and ends.

3.3 COMPOSITE NAIL-BASE INSULATED WALL SHEATHING INSTALLATION

A. Comply with GA-253 and with manufacturer's written instructions.

1. Fasten composite nail-base insulated wall sheathing to wood framing with screws.
2. Fasten composite nail-base insulated wall sheathing to cold-formed metal framing with screws to meet manufacturer’s requirements and building code requirements for size, spacing, etc.
3. Install the composite nail-base insulated wall sheathing panels with joints tightly abutted and ensure an overall flush, level surface.

B. Seal sheathing joints according to composite nail-base insulated wall sheathing manufacturer's written instructions.
   1. Apply pressure-sensitive plastic tape recommended by sheathing manufacturer for sealing joints and penetrations in sheathing and follow all installation requirements of sheathing tape manufacturer for proper procedures.

END OF SECTION 061600 – R2

SECTION 076200 - SHEET METAL FLASHING AND TRIM – R1

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Formed roof-drainage sheet metal fabrications.
2. Formed conventional-slope roof sheet metal fabrications.
3. Formed wall sheet metal fabrications.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at a location to be determined.

1.3 ACTION SUBMITTALS

A. Product Data: For each of the following

1. Underlayment materials.
2. Elastomeric sealant.
3. Butyl sealant.
4. Epoxy seam sealer.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.
9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, fascias, flashings, and counterflashings.
10. Include details of special conditions.
11. Include details of connections to adjoining work.

C. Samples: For each exposed product and for each color and texture specified, 12 inches long by actual width.

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of coping and roof edge flashing that is ANSI/SPRI/FM 4435/ES-1 tested and FM Approvals approved.

B. Evaluation Reports: For copings and roof edge flashing, from an agency acceptable to authority having jurisdiction showing compliance with ANSI/SPRI/FM 4435/ES-1.

C. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance data.

B. Special warranty.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1. For copings and roof edge flashings that are ANSI/SPRI/FM 4435/ES-1 tested and FM Approvals approved, shop shall be listed as able to fabricate required details as tested and approved.

1.7 WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

    a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
    b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
    c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, 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: Architectural Metal Flashing, Condensation and Air Leakage Control, and Reroofing" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. Sheet Metal Standard for Copper: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

D. SPRI Wind Design Standard: Manufacture and install copings, roof edge flashings tested in accordance with ANSI/SPRI/FM 4435/ES-1 and capable of resisting the following design pressure:

1. Design Pressure: As indicated on Drawings.

E. FM Approvals Listing: Manufacture and install copings, roof edge flashings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90. Identify materials with name of fabricator and design approved by FM Approvals.

F. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METALS

A. Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Aluminum Sheet: ASTM B209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.
1. Alclad Finish: Metallurgically bonded surfacing alloy on both sides, forming aluminum sheet with reflective luster.
2. Factory Prime Coating: Where painting after installation is required, pretreat metal with white or light-colored, factory-applied, baked-on epoxy primer coat; minimum dry film thickness of 0.2 mil.

3. Clear Anodic Finish, Coil Coated: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
4. Color Anodic Finish, Coil Coated: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

    a. Color: As selected by Architect from full range of industry colors and color densities.
    b. Color Range: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

5. Exposed Coil-Coated Finish:

    a. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

6. Color: As selected by Architect from manufacturer's full range.
7. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.

2.3 MISCELLANEOUS MATERIALS

A. Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

    a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
    b. Blind Fasteners: High-strength aluminum or stainless steel rivets suitable for metal being fastened.
    c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.

C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

D. Elastomeric Sealant: ASTM C920, elastomeric polyurethane or silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

E. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

2.4 FABRICATION, GENERAL

A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.

1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
2. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
3. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.
4. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
5. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances:

1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.

C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard and by FM Global Property Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.

G. Seams:

1. Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
2. Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
3. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.

2.5 ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters:

1. Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required.
2. Fabricate in minimum 96-inch-long sections.
3. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard, but with thickness not less than twice the gutter thickness.
4. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.
5. Accessories: Continuous, removable leaf screen with sheet metal frame and hardware cloth screen.

6. Gutters with Girth 16 to 20 Inches: Fabricate from the following materials:

    a. Aluminum: 0.040 inch thick. Color to match finish of standing seam roofing.

B. Downspouts: Fabricate rectangular downspouts to dimensions indicated on Drawings, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors. Shop fabricate elbows.

1. Hanger Style: rectangular, wrap around hanger.
2. Fabricate from the following materials:
    a. Aluminum: 0.024 inch thick.
    b. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.

C. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape required, complete with outlet tubes, exterior flange trim, and built-in overflows. Fabricate from the following materials:
1. Aluminum: 0.032 inch thick.
2. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch thick.

D. Splash Pans: Fabricate to dimensions and shape required and from the following materials:

1. Aluminum: 0.040 inch thick.

2.6 STEEP-SLOPE ROOF SHEET METAL FABRICATIONS

A. Apron, Step, Cricket, and Backer Flashing: Fabricate from the following materials:
   1. Aluminum: 0.032 inch thick.

B. Drip Edges: Fabricate from the following materials:
   1. Aluminum: 0.032 inch thick.

C. Eave, Rake, Ridge, Hip Flashing and Fascias: Fabricate from the following materials:
   1. Aluminum: 0.032 inch thick.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.

   1. Install fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
   2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, or sealant.
   3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
   4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
   5. Install continuous cleats with fasteners spaced not more than 12 inches o.c.
   6. Space individual cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
   7. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.
   8. Do not field cut sheet metal flashing and trim by torch.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

   1. Coat concealed side of uncoated-aluminum and stainless steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
   2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.

1. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
2. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
3. Use lapped expansion joints only where indicated on Drawings.

D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction.

1. Use sealant-filled joints unless otherwise indicated.

a. Embed hooked flanges of joint members not less than 1 inch into sealant.
b. Form joints to completely conceal sealant.
c. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way.
d. Adjust setting proportionately for installation at higher ambient temperatures.

1) Do not install sealant-type joints at temperatures below 40 deg F.

2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

G. Rivets: Rivet joints in uncoated aluminum or zinc where necessary for strength.

3.2 INSTALLATION OF ROOF-DRAINAGE SYSTEM

A. Install sheet metal roof-drainage items to produce complete roof-drainage system in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

B. Hanging Gutters:

1. Join sections with riveted and soldered joints or joints sealed with sealant.
2. Provide for thermal expansion.
3. Attach gutters at eave or fascia to firmly anchor them in position.
4. Provide end closures and seal watertight with sealant.
5. Slope to downspouts.
6. Install gutter with expansion joints at locations indicated on Drawings, but not exceeding, 50 feet apart. Install expansion-joint caps.
7. Install continuous gutter screens on gutters with noncorrosive fasteners, removable for cleaning gutters.

C. Downspouts:

1. Join sections with 1-1/2-inch telescoping joints.
2. Provide hangers with fasteners designed to hold downspouts securely to walls.
3. Locate hangers at top and bottom and at approximately 60 inches o.c.
4. Provide elbows at base of downspout to direct water away from building.
5. Connect downspouts to underground drainage system.

D. Splash Pans:

1. Install where downspouts discharge on low-slope roofs.
2. Set in asphalt roofing cement or elastomeric sealant compatible with the substrate.

E. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated on Drawings. Lap joints minimum of 4 inches in direction of water flow.

3.3 INSTALLATION OF ROOF FLASHINGS

A. Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard.

1. Provide concealed fasteners where possible, and set units true to line, levels, and slopes.
2. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Roof Edge Flashing:

1. Install roof edge flashings in accordance with ANSI/SPRI/FM 4435/ES-1.
2. Anchor to resist uplift and outward forces in accordance with recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.
3. Anchor to resist uplift and outward forces in accordance with recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.

C. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches over base flashing. Install stainless steel draw band and tighten.

D. Counterflashing: Coordinate installation of counterflashing with installation of base flashing.

1. Insert counterflashing in reglets or receivers and fit tightly to base flashing.
2. Extend counterflashing 4 inches over base flashing.
3. Lap counterflashing joints minimum of 4 inches.

E. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.4 INSTALLATION TOLERANCES

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

3.5 CLEANING

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

3.6 PROTECTION

A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by Architect.

END OF SECTION 076200 – R1

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS – R1

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum-framed storefront systems.
2. Aluminum-framed entrance door systems.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at a location to be determined.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For aluminum-framed entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.

1. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
2. Include point-to-point wiring diagrams.

C. Samples: For each type of exposed finish required.

D. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams.

E. Delegated-Design Submittal: For aluminum-framed entrances and storefronts, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Energy Performance Certificates: NFRC-certified energy performance values from manufacturer.

B. Product test reports.

C. Source quality-control reports.

D. Field quality-control reports.

E. Sample warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Testing Agency Qualifications: Qualified according to ASTM E699 for testing indicated and accredited by the International Accreditation Service or the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement as complying with ISO/IEC 17025 and acceptable to Owner and Engineer/Architect.

C. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Engineer/Architect, except with Engineer/Architect's approval. If changes are proposed, submit comprehensive explanatory data to Engineer/Architect for review.

1.7 WARRANTY

A. Special Warranty: Manufacturer or Installer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

B. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of baked-enamel, powder-coat, or organic finishes within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

C. Special Finish Warranty, Anodized Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of anodized finishes within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design aluminum-framed entrances and storefronts.

B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure, including, but not limited to, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
2. Failure also includes the following:

a. Thermal stresses transferring to building structure.
b. Glass breakage.
c. Noise or vibration created by wind and thermal and structural movements.
d. Loosening or weakening of fasteners, attachments, and other components.
e. Failure of operating units.

C. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:

1. Minimum Performance Class: AW.
2. Minimum Performance Grade: 40.
3. Minimum Design Pressure: 40.
4. Minimum Structural Test Pressure: 60 psf.
5. Water Resistance Test Pressure: 8 psf.
6. Wind Speed Equivalent: 125mph.

D. Structural Loads:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.

E. Deflection of Framing Members: At design wind pressure, as follows:

1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.

a. Operable Units: Provide a minimum 1/16-inch clearance between framing members and operable units.

3. Cantilever Deflection: Where framing members overhang an anchor point, as follows:

    a. Perpendicular to Plane of Wall: No greater than 1/240 of clear span plus 1/4 inch for spans greater than 11 feet 8-1/4 inches or 1/175 times span, for spans of less than 11 feet 8-1/4 inches.

F. Structural: Test according to ASTM E330/E330M as follows:

1. When tested at positive and negative wind-load design pressures, storefront assemblies, including entrance doors, do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, storefront assemblies, including entrance doors and anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

G. Water Penetration under Static Pressure: Test according to ASTM E331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas, including entrance doors, when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.

H. Energy Performance: Certified and labeled by manufacturer for energy performance as follows:

1. Thermal Transmittance (U-factor):

    a. Fixed Glazing and Framing Areas: U-factor for the system of not more than 0.45 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
    b. Entrance Doors: U-factor of not more than 0.68 Btu/sq. ft. x h x deg F as determined according to NFRC 100.

2. Solar Heat-Gain Coefficient (SHGC):

    a. Fixed Glazing and Framing Areas: SHGC for the system of not more than 0.35 as determined according to NFRC 200.
    b. Entrance Doors: SHGC of not more than 0.35 as determined according to NFRC 200.

3. Air Leakage:

    a. Fixed Glazing and Framing Areas: Air leakage for the system of not more than 0.06 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft. when tested according to ASTM E283.
    b. Entrance Doors: Air leakage of not more than 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.

4. Condensation Resistance Factor (CRF):

    a. Fixed Glazing and Framing Areas: CRF for the system of not less than 55 as determined according to AAMA 1503.
    b. Entrance Doors: CRF of not less than 63 as determined according to AAMA 1503.

I. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 STOREFRONT SYSTEMS

A. Basis of Design shall be Series 500 2” x 7-1/4” Curtain Wall as manufactured by EFCO Corporation.

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

1. Kawneer North America, an Arconic company.

C. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Exterior Framing Construction: Thermally broken.
2. Interior Vestibule Framing Construction: Nonthermal.
3. Glazing System: Retained mechanically with gaskets on four sides.
4. Finish: Baked-enamel or powder-coat finish.
5. Fabrication Method: Field-fabricated stick system.
6. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
7. Steel Reinforcement: As required by manufacturer.

D. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

E. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

2.3 ENTRANCE DOOR SYSTEMS

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. EFCO Corporation.
2. Kawneer North America, an Arconic company.

B. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing or automatic operation.

1. Door Construction: 1-3/4-inch overall thickness, with minimum 0.125-inch- thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.

a. Thermal Construction: High-performance plastic connectors separate aluminum members exposed to the exterior from members exposed to the interior.

2. Door Design: Wide stile; 5-inch nominal width.
3. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.

a. Provide nonremovable glazing stops on outside of door.

2.4 ENTRANCE DOOR HARDWARE

A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 087100 "Door Hardware."

B. General: Provide entrance door hardware and entrance door hardware sets indicated in door and frame schedule for each entrance door, to comply with requirements in this Section.

1. Entrance Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products equivalent in function and comparable in quality to named products.
2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
3. Opening-Force Requirements:

a. Egress Doors: Not more than 15 lbf to release the latch and not more than 30 lbf to set the door in motion and not more than 15 lbf to open the door to its minimum required width.
b. Accessible Interior Doors: Not more than 5 lbf to fully open door.

C. Designations: Requirements for design, grade, function, finish, quantity, size, and other distinctive qualities of each type of entrance door hardware are indicated in "Entrance Door Hardware Sets" Article. Products are identified by using entrance door hardware designations as follows:

1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in "Entrance Door Hardware Sets" Article.
2. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.

D. Butt Hinges: BHMA A156.1, Grade 1, radius corner.

1. Nonremovable Pins: Provide setscrew in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while entrance door is closed.
2. Exterior Hinges: Stainless steel, with stainless-steel pin.
3. Quantities:

a. For doors up to 87 inches high, provide three hinges per leaf.
b. For doors more than 87 and up to 120 inches high, provide four hinges per leaf.

E. Continuous-Gear Hinges: BHMA A156.26.

F. Mortise Auxiliary Locks: BHMA A156.5, Grade 1.

G. Manual Flush Bolts: BHMA A156.16, Grade 1.

H. Automatic and Self-Latching Flush Bolts: BHMA A156.3, Grade 1.

I. Panic Exit Devices: BHMA A156.3, Grade 1, listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.

J. Cylinders:

1. As specified in Section 087100 "Door Hardware."
2. BHMA A156.5, Grade 1.

    a. Keying: Master key system. Permanently inscribe each key with a visual key control number and include notation "DO NOT DUPLICATE" to be furnished by Owner.

K. Strikes: Provide strike with black-plastic dust box for each latch or lock bolt; fabricated for aluminum framing.

L. Operating Trim: BHMA A156.6.

M. Removable Mullions: BHMA A156.3 extruded aluminum.

1. When used with panic exit devices, provide keyed removable mullions listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305. Use only mullions that have been tested with exit devices to be used.

N. Closers: BHMA A156.4, Grade 1, with accessories required for a complete installation, sized as required by door size, exposure to weather, and anticipated frequency of use; adjustable to comply with field conditions and requirements for opening force.

O. Concealed Overhead Holders and Stops: BHMA A156.8, Grade 1.

P. Door Stops: BHMA A156.16, Grade 1, floor or wall mounted, as appropriate for door location indicated, with integral rubber bumper.

Q. Weather Stripping: Manufacturer's standard replaceable components.

1. Compression Type: Made of ASTM D2000 molded neoprene or ASTM D2287 molded PVC.
2. Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.

R. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.

S. Thresholds: BHMA A156.21 raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch.

T. Finger Guards: Manufacturer's standard collapsible neoprene or PVC gasket anchored to frame hinge-jamb at center-pivoted doors.

2.5 GLAZING

A. Glazing: Comply with Section 088000 "Glazing."

B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.

C. Glazing Sealants: As recommended by manufacturer.

2.6 MATERIALS

A. Sheet and Plate: ASTM B209.

B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221.

C. Extruded Structural Pipe and Tubes: ASTM B429/B429M.

D. Structural Profiles: ASTM B308/B308M.

E. Steel Reinforcement:

1. Structural Shapes, Plates, and Bars: ASTM A36/A36M.
2. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
3. Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.

F. Steel Reinforcement Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.

2.7 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fitted joints with ends coped or mitered.
3. Physical and thermal isolation of glazing from framing members.
4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.

5. Provisions for field replacement of glazing from interior for vision glass and exterior for spandrel glazing or metal panels.
6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.

F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.

G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.

H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES

A. High-Performance Organic Finish, Two-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat.

1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. Color and Gloss: As selected by Engineer/Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Comply with manufacturer's written instructions.

B. Do not install damaged components.

C. Fit joints to produce hairline joints free of burrs and distortion.

D. Rigidly secure nonmovement joints.

E. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.

F. Seal perimeter and other joints watertight unless otherwise indicated.

G. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

H. Set continuous sill members and flashing in full sealant bed, as specified in Section 079200 "Joint Sealants," to produce weathertight installation.

I. Install joint filler behind sealant as recommended by sealant manufacturer.

J. Install components plumb and true in alignment with established lines and grades.

3.2 INSTALLATION OF GLAZING

A. Install glazing as specified in Section 088000 "Glazing."

3.3 INSTALLATION OF ALUMINUM-FRAMED ENTRANCE DOORS

A. Install entrance doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.4 FIELD QUALITY CONTROL

A. Field Quality-Control Testing: Perform the following test on representative areas of aluminum-framed entrances and storefronts mockups.

1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Engineer/Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.

    a. Perform a minimum of two tests in areas as directed by Engineer/Architect.

2. Air Leakage: ASTM E783 at 1.5 times the rate specified for laboratory testing in "Performance Requirements" Article but not more than 0.09 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft..

    a. Perform a minimum of two tests in areas as directed by Engineer/Architect.

3. Water Penetration: ASTM E1105 at a minimum uniform static-air-pressure differential of 0.67 times the static-air-pressure differential specified for laboratory testing in "Performance Requirements" Article, but not less than 6.24 lbf/sq. ft., and shall not evidence water penetration.

B. Aluminum-framed entrances and storefronts will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION 084113 – R1

SECTION 085113 - ALUMINUM WINDOWS – R1

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes aluminum windows for exterior locations.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at a location to be determined.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.

C. Samples: For each exposed product and for each color specified.

1.4 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Sample warranties.

1.5 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace aluminum windows that fail in materials or workmanship within specified warranty period.

1. Warranty Period:

a. Window: 10 years from date of Substantial Completion.
b. Glazing Units: 10 years from date of Substantial Completion.
c. Aluminum Finish: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 WINDOW PERFORMANCE REQUIREMENTS

A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

1. Window Certification: AAMA certified with label attached to each window.

B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:

1. Minimum Performance Class: AW.
2. Minimum Performance Grade: 40.
3. Minimum Design Pressure: 40.
4. Minimum Structural Test Pressure: 60 psf.
5. Water Resistance Test Pressure: 8 psf.
6. Wind Speed Equivalent: 125mph.

C. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.30 Btu/sq. ft. x h x deg F.

D. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.40.

E. Condensation-Resistance Factor (CRF): Provide aluminum windows tested for thermal performance according to AAMA 1503, showing a CRF of 62.

F. Thermal Movements: Provide aluminum windows, including anchorage, 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: 120 deg F ambient; 180 deg F material surfaces.

2.2 ALUMINUM WINDOWS

A. Basis of Design shall be Series 5600 2-1/2” x 7-1/4” Curtain Wall as manufactured by EFCO Corporation.

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

1. Kawneer North America, an Arconic company.

C. Types: As indicated on Drawings.

D. Frames and Sashes: Aluminum extrusions complying with AAMA/WDMA/CSA 101/I.S.2/A440.

1. Thermally Improved Construction: Fabricate frames, sashes, and muntins with an integral, concealed, low-conductance thermal barrier located between exterior materials and window members exposed on interior side in a manner that eliminates direct metal-to-metal contact.

E. Glass: Clear annealed glass, ASTM C1036, Type 1, Class 1, q3.

1. Kind: Fully tempered where indicated on Drawings.

F. Insulating-Glass Units: ASTM E2190.

1. Glass: ASTM C1036, Type 1, Class 1, q3.

a. Tint: Clear.
b. Kind: Fully tempered where indicated on Drawings.

2. Lites: Two.
3. Filling: Fill space between glass lites with argon.
4. Low-E Coating: Sputtered on second or third surface.

G. Glazing System: Manufacturer’s standard factory-glazing system that produces weathertight seal.

H. Hardware, General: Provide manufacturer's standard corrosion-resistant hardware sized to accommodate sash weight and dimensions.

1. Exposed Hardware Color and Finish: As selected by Engineer/Architect from manufacturer's full range.

I. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.

J. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.

1. Exposed Fasteners: Do not use exposed fasteners to greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

2.3 ACCESSORIES

A. Subsills: Thermally broken, extruded-aluminum subsills in configurations indicated on Drawings.

B. Column Covers: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.

C. Interior Trim: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.

D. Panning Trim: Extruded-aluminum profiles in sizes and configurations indicated on Drawings.

E. Receptor System: Two-piece, snap-together, thermally broken, extruded-aluminum receptor system that anchors windows in place.

2.4 FABRICATION

A. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.

B. Glaze aluminum windows in the factory.

C. Weather strip each operable sash to provide weathertight installation.

D. Weep Holes: Provide weep holes and internal passages to conduct infiltrating water to exterior.

E. Provide water-shed members above side-hinged sashes and similar lines of natural water penetration.

F. Mullions: Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections. Provide mullions and cover plates capable of withstanding design wind loads of window units.

G. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation.

2.5 ALUMINUM FINISHES

A. High-Performance Organic Finish (Two-Coat Fluoropolymer): AA-C12C40R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: conversion coating; Organic Coating: manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturers' written instructions.

1. Color and Gloss: As selected by Engineer/Architect from full range of industry colors and color densities.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E2112.

B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.

C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.

D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

E. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.

F. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

G. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 085113 – R1

SECTION 087100 - DOOR HARDWARE – R1

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Mechanical door hardware for the following:

a. Swinging doors.
b. Folding doors.

2. Cylinders for door hardware specified in other Sections.
3. Electrified door hardware.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at a location to be determined.

B. Keying Conference: Conduct conference at a location to be determined.

1.3 SUBMITTALS

A. General:
1. Submit in accordance with Conditions of Contract and Division 01 requirements.

2. Highlight, encircle, or otherwise specifically identity on submittals deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the work.

3. Prior to forwarding submittal, comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, “Execution” article, herein.

B. Action Submittals:
1. Product Data: Technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.

2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:

a. Wiring Diagrams: For power, signal, and control wiring and including:
1) Details of interface of electrified door hardware and building safety and security systems.
2) Schematic diagram of systems that interface with electrified door hardware.

3) Point-to-point wiring.
4) Risers.

3. Samples for Verification: If requested by Engineer/Architect, submit production sample or sample installations of each type of exposed hardware unit in finish indicated, and tagged with full description for coordination with schedule.

   a. Samples will be returned to supplier. Units that are acceptable to Engineer/Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

4. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:

   a. Door Index; include door number, heading number, and Engineers/Architects hardware set number.
   b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
   c. Quantity, type, style, function, size, and finish of each hardware item.
   d. Name and manufacturer of each item.
   e. Fastenings and other pertinent information.
   f. Location of each hardware set cross-referenced to indications on Drawings.
   g. Explanation of all abbreviations, symbols, and codes contained in schedule.
   h. Mounting locations for hardware.
   i. Door and frame sizes and materials.
   j. Name and phone number for local manufacturer's representative for each product.
   k. Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and access control components). Operational description should include operational descriptions for: egress, ingress (access), and fire/smoke alarm connections.
      1) Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work that is critical in Project construction schedule.

5. Key Schedule:

   a. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used and door numbers controlled.
   b. Use ANSI/BHMA A156.28 “Recommended Practices for Keying Systems” as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
   c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
   d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.

e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
   1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.

6. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

C. Informational Submittals:

1. Qualification Data: For Supplier, Installer and Architectural Hardware Consultant.
2. Product data for electrified door hardware:
   a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
3. Certificates of Compliance:
   a. UL listings for fire-rated hardware and installation instructions if requested by Engineer/Architect or Authority Having Jurisdiction.
   b. Installer Training Meeting Certification: Letter of compliance, signed by Contractor, attesting to completion of installer training meeting specified in "QUALITY ASSURANCE" article, herein.
   c. Electrified Hardware Coordination Conference Certification: Letter of compliance, signed by Contractor, attesting to completion of electrified hardware coordination conference, specified in "QUALITY ASSURANCE" article, herein.
4. Warranty: Special warranty specified in this Section.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:

   a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
   b. Catalog pages for each product.
   c. Factory order acknowledgement numbers (for warranty and service)
   d. Name, address, and phone number of local representative for each manufacturer.
   e. Parts list for each product.
   f. Final approved hardware schedule, edited to reflect conditions as-installed.
   g. Final keying schedule
   h. Copies of floor plans with keying nomenclature
   i. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
   j. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

1.4 QUALITY ASSURANCE

A. Supplier Qualifications and Responsibilities: Recognized Architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides certified Architectural Hardware Consultant (AHC) available to Owner, Engineer/Architect, and Contractor, at reasonable times during the Work for consultation.

1. Warehousing Facilities: In Project's vicinity.
2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
4. Coordination Responsibility: Assist in coordinating installation of electronic security hardware with Engineer/Architect and electrical engineers and provide installation and technical data to Engineer/Architect and other related subcontractors.
    a. Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.

B. Architectural Hardware Consultant Qualifications: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:

1. For door hardware, DHI-certified, Architectural Hardware Consultant (AHC).
2. Can provide installation and technical data to Engineer/Architect and other related subcontractors.
3. Can inspect and verify components are in working order upon completion of installation.
4. Capable of producing wiring diagrams.
5. Capable of coordinating installation of electrified hardware with Engineer/Architect and electrical engineers.

C. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

D. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

E. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.

F. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in “REFERENCES” article, herein.

G. Keying Conference

1. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:

    a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
    b. Preliminary key system schematic diagram.
    c. Requirements for key control system.

d. Requirements for access control.
e. Address for delivery of keys.

H. Pre-installation Conference

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. Inspect and discuss preparatory work performed by other trades.
3. Inspect and discuss electrical roughing-in for electrified door hardware.
4. Review sequence of operation for each type of electrified door hardware.
5. Review required testing, inspecting, and certifying procedures.

I. Coordination Conferences:

1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.
2. Electrified Hardware Coordination Conference: Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.5 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Three years from date of Substantial Completion unless otherwise indicated below:

a. Electromagnetic and Delayed-Egress Locks: Five years from date of Substantial Completion.
b. Exit Devices: Two years from date of Substantial Completion.
c. Manual Closers: 10 years from date of Substantial Completion.
d. Concealed Floor Closers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Rated Door Assemblies: Where fire-rated doors are indicated, provide door hardware complying with NFPA 80 that is listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

B. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that complies with requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.

1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. at the tested pressure differential of 0.3-inch wg of water.

C. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

E. Accessibility Requirements: For door hardware on doors in an accessible route, comply with ICC A117.1.

2.2 HINGES

A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.

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

a. Allegion plc.
b. Bommer Industries, Inc.
c. McKinney Products Company; an ASSA ABLOY Group company.
d. Stanley Commercial Hardware; a division of Stanley Security Solutions.

2.3 CONTINUOUS HINGES

A. Continuous Hinges: BHMA A156.26; minimum 0.120-inch-thick, hinge leaves with minimum overall width of 4 inches; fabricated to full height of door and frame and to template screw locations; with components finished after milling and drilling are complete.

B. Pin-and-Barrel-Type Hinges:

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

a. Allegion plc.
b. McKinney Products Company; an ASSA ABLOY Group company.
c. Stanley Commercial Hardware; a division of Stanley Security Solutions.

C. Continuous, Gear-Type Hinges: Extruded-aluminum, pinless, geared hinge leaves joined by a continuous extruded-aluminum channel cap; with concealed, self-lubricating thrust bearings.

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

a. Allegion plc.
b. Bommer Industries, Inc.

c. McKinney Products Company; an ASSA ABLOY Group company.
d. Stanley Commercial Hardware; a division of Stanley Security Solutions.
e. Zero International, Inc.

2.4 MECHANICAL LOCKS AND LATCHES

A. Lock Functions: As indicated in door hardware schedule.

B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:

1. Bored Locks: Minimum 1/2-inch latchbolt throw.
2. Mortise Locks: Minimum 3/4-inch latchbolt throw.
3. Deadbolts: Minimum 1-inch bolt throw.

C. Lock Backset: 2-3/4 inches unless otherwise indicated.

D. Lock Trim:

1. Description: K Series.
2. Levers: Cast.

a. Dane.

3. Escutcheons (Roses): Cast.
4. Dummy Trim: Match lever lock trim and escutcheons.

E. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Manufacturer's special strike box fabricated for aluminum framing.
4. Rabbet Front and Strike: Provide on locksets for rabbeted meeting stiles.

F. Bored Locks: BHMA A156.2; Grade 1; Series 4000.

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

a. Allegion plc.
b. Arrow USA; an ASSA ABLOY Group company.
c. Best Access Systems; Stanley Security Solutions, Inc.
d. Corbin Russwin, Inc.; an ASSA ABLOY Group company.
e. SARGENT Manufacturing Company; ASSA ABLOY.
f. Stanley Commercial Hardware; a division of Stanley Security Solutions.
g. Yale Security Inc; an ASSA ABLOY Group company.

G. Mortise Locks: BHMA A156.13; Security Grade 1; stamped steel case with steel or brass parts; Series 1000.

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

a. Allegion plc.
b. Best Access Systems; Stanley Security Solutions, Inc.
c. Corbin Russwin, Inc.; an ASSA ABLOY Group company.
d. SARGENT Manufacturing Company; ASSA ABLOY.
e. Stanley Commercial Hardware; a division of Stanley Security Solutions.
f. Yale Security Inc; an ASSA ABLOY Group company.

2.5 AUXILIARY LOCKS

A. Bored Auxiliary Locks: BHMA A156.36: Grade 1; with strike that suits frame.

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

a. Allegion plc.
b. Best Access Systems; Stanley Security Solutions, Inc.
c. SARGENT Manufacturing Company; ASSA ABLOY.
d. Stanley Commercial Hardware; a division of Stanley Security Solutions.
e. Yale Security Inc; an ASSA ABLOY Group company.

B. Mortise Auxiliary Locks: BHMA A156.36; Grade 1; with strike that suits frame.

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

a. Allegion plc.
b. Best Access Systems; Stanley Security Solutions, Inc.
c. SARGENT Manufacturing Company; ASSA ABLOY.
d. Stanley Commercial Hardware; a division of Stanley Security Solutions.
e. Yale Security Inc; an ASSA ABLOY Group company.

C. Narrow Stile Auxiliary Locks: BHMA A156.36; Grade 1; with strike that suits frame.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Accurate Lock & Hardware Co.
b. Adams Rite Manufacturing Co; an ASSA ABLOY Group company.
c. Kaba Ilco Corp.

D. Push-Button Combination Locks: BHMA A156.36; cylindrical; Grade 1; lock opens by entering a one- to five-digit code by pushing correct buttons in correct sequence; automatically relocks when door is closed; with strike that suits frame.

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

a. Kaba Ilco Corp.

2.6 ELECTRIC STRIKES

A. Electric Strikes: BHMA A156.31; Grade 1; with faceplate to suit lock and frame.

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

a. Allegion plc.
b. Securitron Magnalock Corporation; an ASSA ABLOY Group company.
c. Stanley Commercial Hardware; a division of Stanley Security Solutions.

2.7 ELECTROMAGNETIC LOCKS

A. Electromagnetic Locks: BHMA A156.23; electrically powered; with electromagnet attached to frame and armature plate attached to door; full-exterior or full-interior type, as required by application indicated.

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

a. Allegion plc.
b. Door Controls International, Inc.
c. Securitron Magnalock Corporation; an ASSA ABLOY Group company.
d. Security Door Controls.

2.8 ELECTROMECHANICAL LOCKS

A. Electromechanical Locks: BHMA A156.25; Grade 1; motor or solenoid driven; with strike that suits frame.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Allegion plc.
b. Best Access Systems; Stanley Security Solutions, Inc.
c. SARGENT Manufacturing Company; ASSA ABLOY.
d. Security Door Controls.
e. Stanley Commercial Hardware; a division of Stanley Security Solutions.
f. Yale Security Inc; an ASSA ABLOY Group company.

2. Type: Mortise latchbolt.

2.9 SELF-CONTAINED ELECTRONIC LOCKS

A. Self-Contained Electronic Locks: BHMA A156.25, mortise; with internal, battery-powered, self-contained electronic locks; consisting of complete lockset, motor-driven lock mechanism, and actuating device; enclosed in zinc-dichromate-plated, wrought-steel case, and strike that suits frame. Provide key override, low-battery detection and warning, LED status indicators, and ability to program at the lock.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Allegion plc.
b. Best Access Systems; Stanley Security Solutions, Inc.
c. SARGENT Manufacturing Company; ASSA ABLOY.
d. Yale Security Inc; an ASSA ABLOY Group company.

2.10 EXIT LOCKS AND EXIT ALARMS

A. Exit Locks and Alarms: BHMA A156.29, Grade 1.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Arrow USA; an ASSA ABLOY Group company.
b. Detex Corporation.
c. Precision Hardware, Inc.; a Stanley company.
d. SARGENT Manufacturing Company; ASSA ABLOY.

2.11 SURFACE BOLTS

A. Surface Bolts: BHMA A156.16.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Allegion plc.
b. Burns Manufacturing Incorporated.
c. Door Controls International, Inc.
d. Trimco.

2.12 MANUAL FLUSH BOLTS

A. Manual Flush Bolts: BHMA A156.16; minimum 3/4-inch throw; designed for mortising into door edge.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Adams Rite Manufacturing Co; an ASSA ABLOY Group company.

b. Allegion plc.
c. Burns Manufacturing Incorporated.
d. Door Controls International, Inc.

2.13 EXIT DEVICES AND AUXILIARY ITEMS

A. Exit Devices and Auxiliary Items: BHMA A156.3.

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

a. Allegion plc.
b. Arrow USA; an ASSA ABLOY Group company.
c. Corbin Russwin, Inc.; an ASSA ABLOY Group company.
d. Door Controls International, Inc.
e. SARGENT Manufacturing Company; ASSA ABLOY.
f. Stanley Commercial Hardware; a division of Stanley Security Solutions.
g. Yale Security Inc; an ASSA ABLOY Group company.

2.14 LOCK CYLINDERS

A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver. Provide cylinder from same manufacturer of locking devices.

1. Manufacturers: The Basis of design for the lock cylinders shall be Schlage, an Allegion company. Subject to compliance with requirements, other available manufacturers offering products that may be incorporated into the Work will be reviewed if they are compatible with the owner's existing Schlage cores and keying system.

B. Standard Lock Cylinders: BHMA A156.5; Grade 1 permanent cores; face finished to match lockset.

1. Core Type: Removable.

C. High-Security Lock Cylinders: BHMA A156.30; Grade 1 permanent cores that are removable; face finished to match lockset.

1. Type: M, mechanical.

D. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.

E. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

2.15 KEYING

A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, appendix. Provide one extra key blank for each lock. Incorporate decisions made in keying conference.

1. No Master Key System: Only change keys operate cylinders.

    a. Provide three cylinder change keys.

2. Master Key System: Change keys and a master key operate cylinders.

    a. Provide three cylinder change keys and five master keys.

3. Grand Master Key System: Change keys, a master key, and a grand master key operate cylinders.

    a. Provide three cylinder change keys and five each of master and grand master keys.

4. Great-Grand Master Key System: Change keys, a master key, a grand master key, and a great-grand master key operate cylinders.

    a. Provide three cylinder change keys and five each of master, grand master, and great-grand master keys.

5. Existing System:

    a. Master key or grand master key locks to Owner's existing system.

6. Keyed Alike: Key all cylinders to same change key.

B. Keys: Nickel silver.

1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:

    a. Notation: "DO NOT DUPLICATE."

2.16 KEY CONTROL SYSTEM

A. Key Control Cabinet: BHMA A156.28; metal cabinet with baked-enamel finish; containing key-holding hooks, labels, two sets of key tags with self-locking key holders, key-gathering envelopes, and temporary and permanent markers; with key capacity of 150 percent of the number of locks.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. American Key Boxes and Cabinets.
    b. GE Security, Inc.
    c. HPC, Inc.
    d. Lund Equipment Co., Inc.
    e. MMF Industries.
    f. TelKee; Oasis International.

2. Multiple-Drawer Cabinet: Grade 1 cabinet with drawers equipped with key-holding panels and key envelope storage, and progressive-type ball-bearing suspension slides. Include single cylinder lock to lock all drawers.

3. Wall-Mounted Cabinet: Grade 1 cabinet with hinged-panel door equipped with key-holding panels and pin-tumbler cylinder door lock.
4. Portable Cabinet: Grade 1 tray for mounting in file cabinet, equipped with key-holding panels, envelopes, and cross-index system.

2.17 OPERATING TRIM

A. Operating Trim: BHMA A156.6; aluminum unless otherwise indicated.

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

a. Allegion plc.
b. Burns Manufacturing Incorporated.
c. Rockwood Manufacturing Company; an ASSA ABLOY Group company.

2.18 ACCESSORIES FOR PAIRS OF DOORS

A. Coordinators: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release; and with internal override.

B. Carry-Open Bars: BHMA A156.3; prevent the inactive leaf from opening before the active leaf; provide polished brass or bronze carry-open bars with strike plate for inactive leaves of pairs of doors unless automatic or self-latching bolts are used.

C. Astragals: BHMA A156.22.

2.19 SURFACE CLOSERS

A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written instructions for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Allegion plc.
b. Arrow USA; an ASSA ABLOY Group company.
c. Corbin Russwin, Inc.; an ASSA ABLOY Group company.
d. Hager Companies.
e. Norton Door Controls; an ASSA ABLOY Group company.
f. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
g. SARGENT Manufacturing Company; ASSA ABLOY.
h. Stanley Commercial Hardware; a division of Stanley Security Solutions.
i. Yale Security Inc; an ASSA ABLOY Group company.

2.20 CONCEALED CLOSERS

A. Concealed Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves. Comply with manufacturer's written instructions for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Allegion plc.
    b. DORMA USA, Inc.
    c. Norton Door Controls; an ASSA ABLOY Group company.
    d. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
    e. SARGENT Manufacturing Company; ASSA ABLOY.

2.21 CLOSER HOLDER RELEASE DEVICES

A. Closer Holder Release Devices: BHMA A156.15; Grade 1; closer connected with separate or integral releasing and fire- or smoke-detecting devices. Door shall become self-closing on interruption of signal to release device. Automatic release is activated by smoke detection system or loss of power.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Allegion plc.
    b. Corbin Russwin, Inc.; an ASSA ABLOY Group company.
    c. DORMA USA, Inc.
    d. Norton Door Controls; an ASSA ABLOY Group company.
    e. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
    f. SARGENT Manufacturing Company; ASSA ABLOY.
    g. Stanley Commercial Hardware; a division of Stanley Security Solutions.

2.22 MECHANICAL STOPS AND HOLDERS

A. Wall- and Floor-Mounted Stops: BHMA A156.16.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Allegion plc.
    b. Architectural Builders Hardware Mfg., Inc.
    c. Baldwin Hardware Corporation.
    d. Burns Manufacturing Incorporated.
    e. Door Controls International, Inc.
    f. Hager Companies.
    g. Rockwood Manufacturing Company; an ASSA ABLOY Group company.

2.23 ELECTROMAGNETIC STOPS AND HOLDERS

A. Electromagnetic Door Holders: BHMA A156.15, Grade 1; wall-mounted electromagnetic single unit with strike plate attached to swinging door; coordinated with fire detectors and interface with fire-alarm system for labeled fire-rated door assemblies.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Allegion plc.
b. Architectural Builders Hardware Mfg., Inc.
c. DORMA USA, Inc.
d. Hager Companies.
e. SARGENT Manufacturing Company; ASSA ABLOY.

2.24 OVERHEAD STOPS AND HOLDERS

A. Overhead Stops and Holders: BHMA A156.8.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Allegion plc.
b. Architectural Builders Hardware Mfg., Inc.
c. DORMA USA, Inc.
d. Hager Companies.
e. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
f. SARGENT Manufacturing Company; ASSA ABLOY.

2.25 DOOR GASKETING

A. Door Gasketing: BHMA A156.22; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Hager Companies.
b. M-D Building Products, Inc.
c. National Guard Products, Inc.
d. Pemko Manufacturing Co.
e. Reese Enterprises, Inc.
f. Sealeze.
g. Zero International, Inc.

B. Maximum Air Leakage: When tested according to ASTM E283 with tested pressure differential of 0.3-inch wg, as follows:

1. Smoke-Rated Gasketing: 0.3 cfm/sq. ft. of door opening.
2. Gasketing on Single Doors: 0.3 cfm/sq. ft. of door opening.
3. Gasketing on Double Doors: 0.50 cfm per foot of door opening.

2.26 THRESHOLDS

A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Hager Companies.
b. M-D Building Products, Inc.
c. National Guard Products, Inc.
d. Pemko Manufacturing Co.
e. Reese Enterprises, Inc.
f. Rixson Specialty Door Controls; an ASSA ABLOY Group company.
g. Sealeze.
h. Zero International, Inc.

2.27 SLIDING DOOR HARDWARE

A. Sliding Door Hardware: BHMA A156.14; consisting of complete sets including rails, hangers, supports, bumpers, floor guides, and accessories indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Arthur Cox & Sons, Inc.
b. Hager Companies.
c. Hettich America L.P.
d. Johnson, L. E., Products, Inc.
e. K.N. Crowder Mfg. Inc.
f. PC Henderson Inc.
g. Stanley Commercial Hardware; a division of Stanley Security Solutions.

2.28 FOLDING DOOR HARDWARE

A. General: BHMA A156.14; complete sets including overhead rails, hangers, supports, bumpers, floor guides, and accessories indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Arthur Cox & Sons, Inc.
b. Johnson, L. E., Products, Inc.
c. PC Henderson Inc.
d. Stanley Commercial Hardware; a division of Stanley Security Solutions.

2.29 METAL PROTECTIVE TRIM UNITS

A. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050-inch-thick aluminum; with manufacturer's standard machine or self-tapping screw fasteners.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Allegion plc.
    b. Burns Manufacturing Incorporated.
    c. Hager Companies.
    d. Inpro Corporation.
    e. Pawling Corporation.
    f. Rockwood Manufacturing Company; an ASSA ABLOY Group company.

2.30 AUXILIARY DOOR HARDWARE

A. Auxiliary Hardware: BHMA A156.16.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Allegion plc.
    b. Baldwin Hardware Corporation.
    c. Hager Companies.
    d. Rockwood Manufacturing Company; an ASSA ABLOY Group company.

2.31 AUXILIARY ELECTRIFIED DOOR HARDWARE

A. Auxiliary Electrified Door Hardware:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Allegion plc.
    b. Door Controls International, Inc.
    c. DORMA USA, Inc.
    d. DynaLock Corp.
    e. GE Security, Inc.
    f. Hager Companies.
    g. Precision Hardware, Inc.; a Stanley company.
    h. Rutherford Controls Int'l. Corp.
    i. SARGENT Manufacturing Company; ASSA ABLOY.
    j. Securitron Magnalock Corporation; an ASSA ABLOY Group company.
    k. Security Door Controls.

2.32 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Custom Steel Doors and Frames: HMMA 831.
3. Wood Doors: DHI's "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.

C. Hinges: Install types and in quantities indicated in door hardware schedule, but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

D. Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule, but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches of door height greater than 90 inches.

E. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as indicated in keying schedule or directed by Owner.

F. Key Control Cabinet: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

G. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. Verify location with Engineer/Architect.

1. Configuration: Provide least number of power supplies required to adequately serve doors with electrified door hardware.

H. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 079200 "Joint Sealants."

I. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.

J. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

1. Do not notch perimeter gasketing to install other surface-applied hardware.

K. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

L. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.2 ADJUSTING

A. Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.3 DOOR HARDWARE SCHEDULE

A. The following schedule is furnished for whatever assistance it may afford the Contractor; do not consider it as entirely inclusive. Should any particular door or item be omitted in any scheduled hardware heading, provide door or item with hardware same as required for similar purposes.

Hardware supplier is responsible for handing and sizing all products as listed in the hardware heading. Quantities listed are for each pair of doors, or for each single door.

B. Manufacturer's Abbreviations depicting basis of design for these items:

1. SCH – Schlage
2. VON – Von Duprin
3. LCN – Allegion LCN
4. NGP - NGP
5. IVE – Ives
6. FAL – Falcon
7. ISO – Isonas
8. HES – H.E.S. assa abloy
9. GLY – Glynn-Johnson

HARDWARE SETS

QTY	ITEM	MODEL NUMBER	FINISH	MFR
SET # 1	***- 901B***			
1	CONT. HINGE	112HD	628	IVE
1	STORE ROOM LOCK	T581H7 DANE	626	FAL
1	SFIC CORE	C607	626	FAL
1	WALL STOP	WS 406/407 CVX	630	IVE
1	ELECTRIC STRIKE	1006 SERIES	630	HES
1	SURFACE CLOSER	1450 PARALLEL ARM MOUNT	695	LCN
1	DOOR SWEEP	39A	A	ZER
1	CARD READER	PUREIP RC-04 MCT-W		ISO
SET # 2	***- 913B***			
1	CONT. HINGE	112 HD	652	IVE
1	CLASSROOM LOCK	T561H7 DANE	626	FAL
1	SFIC CORE	C607	626	FAL
1	WALL STOP	WS 406/407 CVX	630	IVE
1	SURFACE CLOSER	1450 PARALLEL ARM MOUNT	689	LCN
1	MOUNTING PLATE	1450-18	689	LCN
2	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
3	SILENCER	SR64	GRY	IVE
SET #3	***- 906, 907, 908***			
3	HINGE	5BB1 4.5 X 4.5	652	IVE
1	CLASSROOM LOCK	T561H7 DANE	626	FAL
1	SFIC CORE	C607	626	FAL
1	SURFACE CLOSER	1450 REG ARM MOUNT	695	LCN
2	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	WALL STOP	WS406/407CVX	630	IVE
3	SILENCER	SR64	GRY	IVE
SET # 4	***- 902B, 903B, 911***			
6	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
2	DUMMY TRIM	DANE W SERIES	626	FAL
2	OH STOP	90S	652	GLY
2	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	SILENCER	SR64	GRY	IVE
2	Magnetic Catch	325		IVE
SET # 5	***- 912B***			
3	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	CLASSROOM LOCK	T561H7 DANE	626	FAL
1	SFIC CORE	C607	626	FAL
1	SURFACE CLOSER	1450 REG ARM MOUNT	695	LCN
1	OH STOP	90S	652	GLY
2	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
3	SILENCER	SR64	GRY	IVE

SET # 6 - 912A

1	CONT. HINGE	112 HD	628	IVE
1	CLASSROOM LOCK	T561H7 DANE	626	FAL
2	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	AUTO OPERATOR	9540 – 18 ANCLR75.5		LCN
2	DOOR ACTUATORS	8310-856T(HARD WIRED)		LCN
1	ELECTRIC STRIKE	1006 SERIES	630	HES
3	SILENCER	SR64	GRY	IVE

SET # 7 - 913A

1	CONT. HINGE	112HD	628	IVE
1	STOREROOM LOCK	T581 H7 DANE	626	FAL
1	SFIC CORE	C607	626	FAL
1	GASKETING	328AA-S	AA	ZER
1	DOOR BOTTOM	355A6	A	ZER
1	AUTO OPERATOR	9540-18 ANCLR75.5		LCN
2	DOOR ACTUATORS	8310-856T(HARD WIRED)		LCN
1	ELECTRIC STRIKE	1006 SERIES		HES
1	DOOR SWEEP	39A	A	ZER
1	THRESHOLD	655A	A	ZER
1	CARD READER	PUREIP RC-04 MCT-W		ISO
1	LOCK GUARD	LG14	630	IVE

SET #8 - 901A

1	CONT. HINGE	224HD	628	IVE
2	SFIC CORE	C607	626	FAL
1	AUTO OPERATOR	9540 – 18 ANCLR75.5		LCN
1	DOOR BOTTOM	355A6	A	ZER
2	DOOR ACTUATORS	8 310-856T(HARD WIRED)		LCN
1	ELECTRIC STRIKE	1006 SERIES		HES
1	GASKETING	328AA-S	AA	ZER
1	DOOR SWEEP	39A	A	ZER
1	THRESHOLD	655A	A	ZER
1	CARD READER	PUREIP RC-04 MCT-W		ISO
1	LOCK GUARD	LG14	630	IVE

SET # 9 - 902A, 903A

3	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	CLASSROOM LOCK	T561H7 DANE	626	FAL
1	SFIC CORE	C607	626	FAL
1	SURFACE CLOSER	1450 REG ARM MOUNT	689	LCN
2	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	WALL STOP	WS406/407CVX	630	IVE
3	SILENCER	SR64	GRY	IVE

SET # 10 - 904

3	HINGE	5BB1 4.5 X 4.5	652	IVE

1	CLASSROOM LOCK	T561H7 DAN	626	FAL
1	SFIC CORE	C607	626	FAL
1	SURFACE CLOSER	450 REG ARM MOUNT	689	LCN
3	SILENCER	SR64	GRY	IVE
2	KICK PLATE	8400 10” X 1 1/2” LDW B-CS	630	IVE

SET # 11 - 909, 905

3	HINGE	5BB1 4.5 X 4.5	652	IVE
1	PASSAGE SET	T101 DANE	626	FAL
1	SURFACE CLOSER	1450 REG ARM MOUNT	695	LCN
1	WALL STOP	WS406/407CVX	630	IVE
3	SILENCER	SR64	GRY	IVE
2	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE

SET # 12 - 915, 916

3	HINGE	5BB1 4.5 X 4.5	652	IVE
1	DOOR PULL, 1" ROUND	8103EZHD 10" O	630-316	IVE
1	PUSH PLATE	8200 3" X 12"	630	IVE
1	SURFACE CLOSER	1450 REG ARM MOUNT	695	LCN
2	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
3	SILENCER	SR64	GRY	IVE

END OF SECTION 087100 – R1

SECTION 088000 – GLAZING – R1

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes but is not necessarily limited to:

1. Glass for windows, doors and sidelights.
2. Glazing sealants and accessories.
3. Fire Protection Rated Glazing

1.2 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.

C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

D. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Preconstruction adhesion and compatibility test report.

1.5 QUALITY ASSURANCE

A. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021 to conduct the testing indicated.

1.6 PRECONSTRUCTION TESTING

A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.

1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.

1.7 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 Fire-Rated Glass: Manufacturer agrees to replace fired-rated glass units that deteriorate within specified warranty period. Deterioration of fired-rated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning fired-rated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced fired-rated glass standard.

1. Warranty Period: 10 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 the 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. 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. Cardinal Glass Industries.
2. Guardian Glass; SunGuard.
3. Pilkington North America.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design glazing.

B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the International Building Code and ASTM E1300.

1. Design Wind Pressures: As indicated on Drawings.
2. Design Snow Loads: As indicated on Drawings.
3. Thickness of Patterned Glass: Base design of patterned glass on thickness at thinnest part of the glass.
4. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

C. Windborne-Debris Impact Resistance: Exterior glazing shall pass ASTM E1886 missile-impact and cyclic-pressure tests in accordance with ASTM E1996 for Wind Zone 1 for basic protection.

1. Large-Missile Test: For glazing located within 30 feet of grade.
2. Small-Missile Test: For glazing located between 30 feet (9.1 m) and 60 feet above grade.

D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

E. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

1. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F.
2. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR A7, "Sloped Glazing Guidelines."
3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."
4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.

E. 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. Tinted Annealed Float Glass: ASTM C1036, Type I, Class 2 (tinted), Quality-Q3.

C. 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.

D. 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.

E. Pyrolytic-Coated, Low-Maintenance Glass: Clear float glass with a coating on first surface having both photocatalytic and hydrophilic properties that act to loosen dirt and to cause water to sheet evenly over the glass instead of beading.

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

a. Pilkington North America.
b. Saint-Gobain Glass Exprover NA.

F. Silicone-Coated Spandrel Glass: ASTM C1048, Type I, Condition C, Quality-Q3.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. ICD High Performance Coatings.

2.5 FIRE PROTECTION RATED GLASS

A. Fire Protection Rated Glass Basis of Design: SuperClear 45-HS as manufactured by Safety and Fire Technlogy Inc., phone (888) 653-3333, web site http://www.safti.com . Use materials that have a proven record of no tendency to lose physical and mechanical properties after fabrication and installation.

1. Fire-rated glass ceramic clear and wireless glazing material listed for use in non-impact safety-rated locations such as transoms and borrowed lites with fire rating requirements for 45 minutes with required hose stream test.
2. Passes positive pressure test standards UL 10C.
3. Properties:
   a. Thickness: 3/4 inch [19 mm] overall.
   b. Weight: 9 lbs./sq. ft.
   c. Approximate Visible Transmission: 83 percent.
   d. Approximate Visible Reflection: 9 percent.
   e. Fire-rating: 45 minutes with hose stream.
   f. Impact Safety Resistance: ANSI Z97.1 Class A and B and CPSC 16CFR1201 (Cat. I and II).
   g. STC Rating: Approximately 37 dB.
   h. Surface Finish:
   i. Appearance: clear, wireless and tint-free.
   j. Positive Pressure Test: UL 10C; passes.
4. Maximum sheet sizes based on surface finish:
   a. Premium: 48 inches by 96 inches.
   b. Standard: 48 inches by 96 inches.
5. Labeling: Permanently label each piece with a permanent logo including name of product, manufacturer, testing laboratory, fire rating, period and safety glazing standards.
6. Glazing material installed in Hazardous Locations, subject to human impact, shall be certified and permanently labeled as meeting applicable requirements referenced in NFPA 80: a. CPSC 16 CFR 1201, Cat. I or II.

2.6 INSULATING GLASS

A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E2190.

1. Sealing System: Dual seals.
2. Perimeter Spacer: Manufacturer's standard spacer material and construction.

   a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

      1) Technoform.
      2) Thermix; a brand of Ensinger USA.

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. Colors of Exposed Glazing Sealants: As selected by Engineer/Architect from manufacturer's full range.

B. Glazing Sealant:
1. Neutral-curing silicone glazing sealant complying with ASTM C920, Type S, Grade NS, Class 100/50, Use NT.

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) Sika Corporation.
2) The Dow Chemical Company.

2.8 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.9 MISCELLANEOUS GLAZING MATERIALS

A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

B. Setting Blocks:

1. EPDM or Silicone with a Shore A durometer hardness of 85, plus or minus 5.
2. Type recommended by sealant or glass manufacturer.

C. Spacers:

1. Neoprene blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
2. Type recommended by sealant or glass manufacturer.

D. Edge Blocks:

1. EPDM or Silicone with a Shore A durometer hardness per manufacturer's written instructions.
2. Type recommended by sealant or glass manufacturer.

E. 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.

PART 3 - EXECUTION

3.1 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.

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

3.2 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Apply heel bead of elastomeric sealant.

F. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

G. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.3 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.4 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.

3.5 CLEANING AND PROTECTION

A. Immediately after installation remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

3.6 MONOLITHIC GLASS SCHEDULE

A. Glass Type GL-1: Clear annealed float glass.

1. Minimum Thickness: 6 mm.
2. Safety glazing required.

B. Glass Type GL-2: Ultraclear heat-strengthened float glass.

1. Basis-of-Design Product: PPG Industries, Inc.; Starphire.
2. Minimum Thickness: 6 mm.
3. Safety glazing required.

C. Glass Type GL-#3: Pyrolytic-coated, self-cleaning, low-maintenance, clear fully tempered float glass.

1. Basis-of-Design Product: Cardinal Glass Industries; Neat.
2. Minimum Thickness: 6 mm.
3. Safety glazing required.

3.7 LAMINATED GLASS SCHEDULE

A. Glass Type GL-4: Clear laminated glass with two plies of ultraclear fully tempered float glass.

1. Basis-of-Design Product: Cardinal Glass
2. Minimum Thickness of Each Glass Ply: 6 mm.
3. Interlayer Thickness: 0.060 inch.
4. Safety glazing required.

3.8 INSULATING GLASS SCHEDULE

A. Glass Type GL-5: Pyrolytic-coated, self-cleaning, low-maintenance, low-E coated, clear insulating glass.

1. Basis-of-Design Product: Cardinal Glass Industries; Neat LoE.
2. Overall Unit Thickness: 1 inch.
3. Minimum Thickness of Each Glass Lite: 6 mm.
4. Outdoor Lite: Pyrolytic-coated, self-cleaning, low-maintenance, clear fully tempered float glass.
5. Interspace Content: Argon.
6. Indoor Lite: Fully tempered float glass.
7. Low-E Coating: Pyrolytic or sputtered on second or third surface.
8. Winter Nighttime U-Factor: 0.28 maximum.
9. Summer Daytime U-Factor: 0.25 maximum.
10. Visible Light Transmittance: 72% percent minimum.
11. Solar Heat Gain Coefficient: 0.41 maximum.
12. Safety glazing required.

B. Glass Type GL-6: Pyrolytic-coated, self-cleaning, low-maintenance, low-E coated, clear insulating, tempered safety glass.

1. Basis-of-Design Product: Cardinal Glass Industries; Neat LoE.
2. Overall Unit Thickness: 1 inch.
3. Minimum Thickness of Each Glass Lite: 6 mm.
4. Outdoor Lite: Pyrolytic-coated, self-cleaning, low-maintenance, clear fully tempered float glass.
5. Interspace Content: Argon.
6. Indoor Lite: Fully tempered float glass.
7. Low-E Coating: Pyrolytic or sputtered on second or third surface.
8. Winter Nighttime U-Factor: 0.28 maximum.
9. Summer Daytime U-Factor: 0.25 maximum.
10. Visible Light Transmittance: 72% percent minimum.
11. Solar Heat Gain Coefficient: 0.41 maximum.
12. Safety glazing required.

C. Glass Type GL-7: Silicone-coated, insulating spandrel glass.

1. Basis-of-Design Product: ICD High Performance Coatings, Opaci-Coat 300.
2. Coating Color: As selected by Engineer/Architect from manufacturer's full range.
3. Overall Unit Thickness: 1 inch.
4. Minimum Thickness of Each Glass Lite: 6 mm.
5. Outdoor Lite: fully tempered float glass.
6. Interspace Content: Argon.
7. Indoor Lite: fully tempered float glass.
8. Coating Location: Fourth surface.
9. Winter Nighttime U-Factor: 0.31 maximum.
10. Summer Daytime U-Factor: 0.28 maximum.

D. Glass Type GL-7: Clear Annealed glass.

1. Basis-of-Design Product: ICD High Performance Coatings, Opaci-Coat 300.

2. Coating Color: As selected by Engineer/Architect from manufacturer's full range.
3. Overall Unit Thickness: 1 inch.
4. Minimum Thickness of Each Glass Lite: 6 mm.
5. Outdoor Lite: fully tempered float glass.
6. Interspace Content: Argon.
7. Indoor Lite: fully tempered float glass.
8. Coating Location: Fourth surface.
9. Winter Nighttime U-Factor: 0.31 maximum.
10. Summer Daytime U-Factor: 0.28 maximum.

END OF SECTION 088000 – R1

SECTION 114000 - KITCHEN EQUIPMENT – R1

1.1 SUMMARY

A. Section includes equipment for kitchen facilities.

B. Owner-Furnished Equipment: Where indicated, Owner will furnish equipment for installation by Contractor.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For fabricated equipment. Include plans, elevations, sections, roughing-in dimensions, fabrication details, utility service requirements, and attachments to other work.

C. Samples for Initial Selection: For units with factory-applied color finishes.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: For kitchen facilities.

1. Indicate locations of kitchen equipment and connections to utilities.
2. Key equipment using same designations as indicated on Drawings.
3. Include plans and elevations; clearance requirements for equipment access and maintenance; details of equipment supports; and utility service characteristics.
4. Include details of seismic bracing for equipment.

B. Sample warranties.

1.5 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.6 WARRANTY

A. Refrigeration Compressor Warranty: Manufacturer agrees to repair or replace compressors that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. NSF Standards: Provide equipment that bears NSF Certification Mark or UL Classification Mark certifying compliance with applicable NSF standards.

B. UL Certification: Provide electric and fuel-burning equipment and components that are evaluated by UL for fire, electric shock, and casualty hazards according to applicable safety standards, and that are UL certified for compliance and labeled for intended use.

C. Regulatory Requirements: Install equipment to comply with the following:

1. ASHRAE 15, "Safety Code for Mechanical Refrigeration."
2. NFPA 54, "National Fuel Gas Code."
3. NFPA 70, "National Electrical Code."
4. NFPA 96, "Ventilation Control and Fire Protection of Commercial Cooking Operations."

D. Seismic Restraints: Comply with SMACNA's "Kitchen Ventilation Systems and Food Service Equipment Fabrication and Installation Guidelines," Appendix A, "Seismic Restraint Details," unless otherwise indicated.

2.2 KITCHEN EQUIPMENT

A. Refrigeration Equipment: Refrigerators.

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

a. Fridgaire
b. Or Approved Equal

2. Basis of Design Description: Reach-in type, side by side refrigerator – GRSN2620AF

a. Exterior Finish: Stainless steel.
b. Interior Finish: Stainless steel.
c. Doors: 2 Full length.
d. Accessories:

1) 3 Adjustable glass shelves
2) 2 Drawers
3) 4 Door bins

e. Electrical Service: Equip unit with plug and cord for service indicated on Drawings.

2.3 MISCELLANEOUS MATERIALS

A. Installation Accessories, General: NSF certified for end-use application indicated.

B. Elastomeric Joint Sealant: ASTM C920; silicone. Type S (single component), Grade NS (nonsag), Class 25, Use NT (nontraffic) related to exposure, and Use M, G, A, or O as applicable to joint substrates indicated.

1. Public Health and Safety Requirements:

a. Sealant is certified for compliance with NSF standards for end-use application indicated.
b. Washed and cured sealant complies with the FDA's regulations for use in areas that come in contact with food.

2. Cylindrical Sealant Backing: ASTM C1330, Type C, closed-cell polyethylene, in diameter greater than joint width.

2.4 FINISHES

A. Stainless Steel Finishes: Remove tool and die marks and stretch lines, or blend into finish. Grind and polish surfaces to produce uniform finish, free of cross scratches.

B. Powder-Coat Finishes: Comply with resin manufacturer's written instructions for application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install kitchen equipment level and plumb, according to manufacturer's written instructions.

1. Connect equipment to utilities.
2. Provide cutouts in equipment, neatly formed, where required to run service lines through equipment to make final connections.

B. Complete equipment assembly where field assembly is required.

1. Provide closed butt and contact joints that do not require a filler.
2. Grind field welds on stainless steel equipment until smooth and polish to match adjacent finish.

C. Install equipment with access and maintenance clearances that comply with manufacturer's written installation instructions and with requirements of authorities having jurisdiction.

D. Install cabinets and similar equipment on bases in a bed of sealant.

E. Install closure-trim strips and similar items requiring fasteners in a bed of sealant.

F. Install joint sealant in joints between equipment and abutting surfaces with continuous joint backing unless otherwise indicated. Produce airtight, watertight, vermin-proof, sanitary joints.

3.2 CLEANING AND PROTECTING

A. After completing installation of equipment, repair damaged finishes.

B. Clean and adjust equipment as required to produce ready-for-use condition.

C. Protect equipment from damage during remainder of the construction period.

3.3 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain kitchen equipment.

END OF SECTION 114000 – R1

SECTION 115313 - LABORATORY FUME HOODS – R1

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Bench-top laboratory fume hoods.
2. Piping and wiring within fume hoods for service fittings, light fixtures, fan switches, and other electrical devices included with fume hoods.
3. Fume hood base cabinets.
4. Fume hood base stands.
5. Work tops within fume hoods.
6. Water, laboratory gas, and electrical service fittings in fume hoods.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For laboratory fume hoods.

1. Include plans, elevations, sections, and attachment details.
2. Indicate details for anchoring fume hoods to permanent building construction including locations of blocking and other supports. Include calculations demonstrating that anchorages comply with seismic performance requirements.
3. Indicate locations and types of service fittings together with associated service supply connection required.
4. Indicate duct connections, electrical connections, and locations of access panels.
5. Include roughing-in information for mechanical, plumbing, and electrical connections.

C. Samples: For fume hood exterior finishes, interior lining and phenolic-composite work tops.

D. Delegated Design Submittals: For fume hoods indicated to comply with seismic performance requirements and design criteria.

1.3 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Showing compliance with specified performance requirements for as-manufactured containment and static pressure loss, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency.

B. Field quality-control reports.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Constant Volume Fume Hoods with Steel Exterior:

1. Basis of Design: Kewaunee Scientific Corporation, Model V26 – General Purpose LX Bench Fume Hood with combination rising sash, (overall size of 60” wide x 42.5” deep).

2. Manufacturers: Subject to compliance with requirements, other available manufacturers offering products may be incorporated into the Work and are not limited to the following basis of design unit. The Laboratory Casework and the Laboratory Fume Hood shall be provided by the same manufacturer and the contractor must coordinate with the M-contract for fan specs.

B. Product Designations: Drawings indicate sizes, types, and configurations of fume hoods by referencing designated manufacturer's catalog numbers. Other manufacturers' fume hoods of similar sizes, types, and configurations, and complying with the Specifications, may be considered. See Section 016000 "Product Requirements."

2.2 PERFORMANCE REQUIREMENTS

A. Containment: Provide fume hoods that comply with the following when tested according to ASHRAE 110:

1. As-Manufactured (AM) Rating: AM 0.02 (0.02 ppm)
2. Average Face Velocity: 80 fpm plus or minus 10 percent with sashes fully open.
3. Face-Velocity Variation: Not more than 15 percent of average face velocity across the face opening with sashes fully open.

B. Static-Pressure Loss: Not more than 1/2-inch wg at 80-fpm face velocity with sash fully open when measured at four locations 90 degrees apart around the exhaust duct and at least three duct diameters downstream from duct collar.

C. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design fume hoods for seismic performance.

D. Seismic Performance: Fume hoods, including attachments to other work, to withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. Design earthquake spectral response acceleration, short period (Sds);
   a. See Structural Drawings.
2. Component Importance Factor: 1.5.

2.3 FUME HOODS

A. Product Standards: Comply with SEFA 1, "Laboratory Fume Hoods - Recommended Practices." Provide fume hoods UL listed and labeled for compliance with UL 1805.

B. Constant-Volume Fume Hoods: Provide constant-volume fume hoods without bypass where indicated.

2.4 MATERIALS

A. Steel Sheet: Cold-rolled, commercial steel (CS) sheet, complying with ASTM A1008/A1008M; matte finish; suitable for exposed applications.

B. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304, stretcher-leveled standard of flatness.

1. For perchloric acid fume hoods, use Type 316L instead of Type 304.

C. Glass-Fiber-Reinforced Polyester: Polyester laminate with a chemical-resistant gel coat on exposed faces, and having a flame-spread index of 25 or less according to ASTM E84.

D. Glass: Clear, laminated tempered glass complying with ASTM C1172, Kind LT, Condition A, Type I, Class I, Quality-Q3; with two plies not less than 3.0 mm thick and with clear, polyvinyl butyral interlayer.

1. Permanently mark safety glass with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction or the manufacturer. Label to indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

F. Fasteners: Provide stainless steel fasteners where exposed to fumes.

2.5 FABRICATION

A. General: Assemble fume hoods in factory to greatest extent possible. Disassemble fume hoods only as necessary for shipping and handling limitations. Fume hoods to be capable of being partly disassembled as necessary to permit movement through a 35-by-79-inch door opening.

B. Steel Exterior: Fabricate from steel sheet, 0.048 inch thick, with component parts screwed together to allow removal of end panels, front fascia, and airfoil and to allow access to plumbing lines and service fittings. Apply chemical-resistant finish to interior and exterior surfaces of component parts before assembly.

C. Product Option: Provide either steel or fiberglass exterior as specified above.

D. Ends: Fabricate with double-wall end panels without projecting corner posts or other obstructions to interfere with smooth, even airflow. Close area between double walls at front of fume hood and as needed to house sash counterbalance weights, utility lines, and remote-control valves.

E. Splay top and sides of face opening to provide an aerodynamic shape to ensure smooth, even flow of air into fume hood.

F. Interior Lining: Provide the following unless otherwise indicated:

G. Stainless Steel Lining Assembly: Welded unit consisting of end panels, back panel, top, and work top; reinforced to form a rigid assembly to which exterior is attached.

1. For perchloric acid and radioisotope fume hood linings, cove corners and weld seams completely, and grind surfaces smooth and polish as needed to produce uniform, directionally textured finish with no evidence of welds and free of cross scratches. Passivate and rinse surfaces; remove embedded foreign matter and leave surfaces clean.

H. Rear Baffle: Unless otherwise indicated, provide baffle, of same material as fume hood lining, at rear of hood with openings at top and bottom. Secure baffle to cleats at rear of hood with stainless steel screws. Fabricate baffle for easy removal for cleaning behind baffle.

1. Provide preset baffles unless otherwise indicated.
2. Provide epoxy-coated, stainless steel screen at bottom baffle opening to prevent paper from being drawn into the exhaust plenum behind baffles.

I. Exhaust Plenum: Full width of fume hood and with adequate volume to provide uniform airflow from hood, of same material as hood lining, and with duct stub for exhaust connection.

1. Duct-Stub Material: stainless steel

J. Bypass Grilles: Provide grilles at bypass openings of fume hoods.

K. Sashes: Provide operable sashes of type indicated.

1. Fabricate from 0.050-inch- thick stainless steel. Form into four-sided frame with bottom corners welded and finished smooth. Make top member removable for glazing replacement. Set glazing in chemical-resistant, U-shaped gaskets.
2. Fume hood sash support to employ notched belt and shaft interlocked gears. Belt to be Polyurethane with green polyamide fabric on notch side, 10mm wide x 5.6mm thick rated at 3600N tensile strength. Support system to be rated to 300,000 cycles (one cycle = one full up and one full down sash motion) without a failure. Sash support system to employ retainers to ensure sash remains level and square throughout use.

L. Airfoil: Unless otherwise indicated, provide airfoil at bottom of fume hood face opening with 1-inch space between airfoil and work top. Sash closes on top of airfoil, leaving 1-inch opening for air intake. Airfoil directs airflow across work top to remove heavier-than-air gases and to prevent reverse airflow.

1. Fabricate airfoil from stainless steel

M. Light Fixtures: An LED light fixture shall be provided in the hood roof. The light shall provide fifteen (15) intensity adjustment levels and three (3) color options. Illumination at the worksurface shall be at 100 foot-candles at the full intensity setting. The light fixture shall be isolated from the hood interior by a 1/4" thick tempered glass panel sealed from the hood cavity. Fixture shall be UL listed.

N. Perchloric Acid Fume Hood Washdown System: Provide perchloric acid fume hoods with washdown system consisting of stainless steel spray nozzles, washdown valve, and associated

piping. Design system to thoroughly rinse all surfaces of fume hood interior, including areas behind and above baffles, and to direct rinse water toward drain trough at rear of work top. Provide T-fitting for extending system to additional spray nozzles in exhaust ducts.

O. Filler Strips: Provide as needed to close spaces between fume hoods or fume hood base cabinets and adjacent building construction. Fabricate from same material and with same finish as fume hoods or fume hood base cabinets, as applicable.

P. Ceiling Extensions: Provide filler panels matching fume hood exterior to enclose space above fume hoods at front and sides of fume hoods and extending from tops of fume hoods to ceiling.

Q. Finished Back Panels: Where rear surfaces of fume hoods are exposed to view, provide finished back panels matching rest of fume hood enclosure.

R. Comply with requirements in other Sections for installing water and laboratory gas service fittings, piping, electrical devices, and wiring. Install according to Shop Drawings. Securely anchor fittings, piping, and conduit to fume hoods unless otherwise indicated.

2.6 FUME HOOD, BASE CABINETS, BASE STANDS, WORK TOPS, TROUGHS, SINKS, AND, SERVICE FITTINGS.

A. Comply with Section 123553.13 "Metal Laboratory Casework." Provide metal base cabinets in finish matching fume hood exterior finish.

B. Work Tops: Phenolic composite.

1. Work-Top Configuration: Raised (marine) edge with rounded edge and corners.

C. Structural Performance of Radioisotope Fume Hood Components: Capable of withstanding the following loads without permanent deformation, excessive deflection, or binding of cabinet drawers and doors:

1. Work Tops: 200 lb/ft..
2. Base Cabinets: 75 lb/ft. within cabinets, 50-lb/ft. work top, 200 lb/ft. on work top, plus weight of hood.

D. Fume Hood Base Stands: Welded steel tubing legs, not less than 2 inches square with channel stretchers and aprons. Weld or bolt stretchers to legs and cross-stretchers, and bolt legs to aprons. Provide leveling device welded to bottom of each leg.

1. Knee Space: Provide clear floor space not less than **30 inches** wide by 25 inches deep by 27 inches high within fume hood base stands unless otherwise indicated.

2.7 CHEMICAL-RESISTANT FINISH

A. Preparation: Clean steel surfaces, other than stainless steel, of mill scale, rust, oil, and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it.

B. Chemical-Resistant Finish: Immediately after cleaning and pretreating, apply fume hood manufacturer's standard two-coat, chemical-resistant, baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils.

1. Chemical and Physical Resistance of Finish System: Finish complies with acceptance levels of cabinet surface finish tests in SEFA 8M. Acceptance level for chemical spot test to be no more than four Level 3 conditions.
2. Colors for Fume Hood Finish: As selected by Architect from manufacturer's full range.

2.8 ACCESSORIES

A. Airflow Indicator and Alarm: Provide each fume hood with manufacturer's standard airflow indicator with audible and visual alarm that activates when airflow sensor reading is outside of preset range.

B. Airflow Indicator: Provide each fume hood with airflow indicator of[**one of**] the following type(s):

1. Indicator Type: Thermal anemometer that measures fume hood face velocity and displays data as digital readout.

C. Airflow Alarm: Provide fume hoods with audible and visual alarm that activates when airflow sensor reading is outside of preset range.

1. Provide with thermal-anemometer or aneroid (Magnehelic-type) gage airflow sensor.
2. Provide with reset and test switches.
3. Provide with switch that silences audible alarm and automatically resets when airflow returns to within preset range.

D. Sash Alarm: Provide fume hoods with audible and visual alarm that activates when sash is opened beyond preset position.

1. Provide with silence and test switches.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install fume hoods according to manufacturer's written instructions. Install level, plumb, and true; shim as required, using concealed shims, and securely anchor to building and adjacent laboratory casework. Securely attach access panels but provide for easy removal and secure reattachment. Where fume hoods abut other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.

B. Comply with requirements in Section 123553.13 "Metal Laboratory Casework" for installing fume hood base cabinets and work tops.

C. Comply with requirements for installing water and laboratory gas service fittings and electrical devices.

1. Install fittings according to Shop Drawings, installation requirements in SEFA 2.3, and manufacturer's written instructions. Set bases and flanges of work top-mounted fittings in sealant recommended by manufacturer of work-top material. Securely anchor fittings to fume hoods unless otherwise indicated.

3.2 FIELD QUALITY CONTROL

A. Field test installed fume hoods according to ASHRAE 110 to verify compliance with performance requirements.

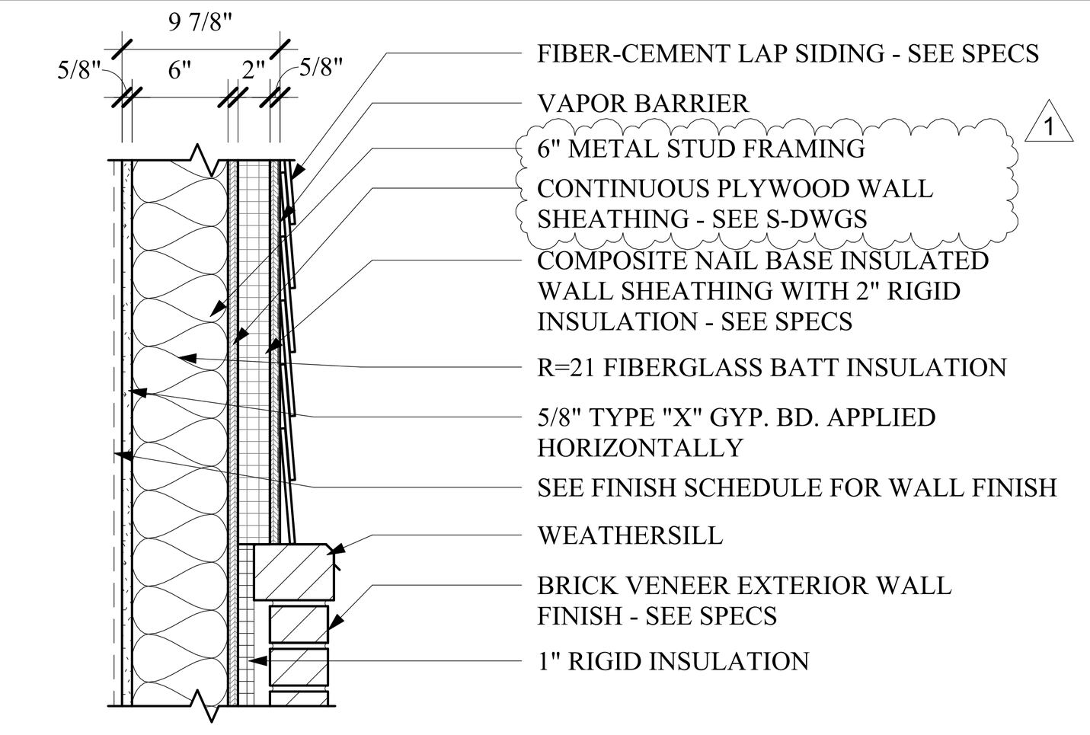
B. ASHRAE Test Standard 110-2016 Test

1. Hood shall be tested with a face velocity of 50 FPM (bench hoods only) with the sash at the maximum opening, 28”. The hood shall have a performance rating in the static portion of ASHRAE 110-2016 of AM 0.05 parts per million (PPM) or better wherein:
2. 4.0 = tracer gas release in liters/minute
3. AM= as manufactured
4. 0.05 = 5-minute time average control level of tracer gas in PPM

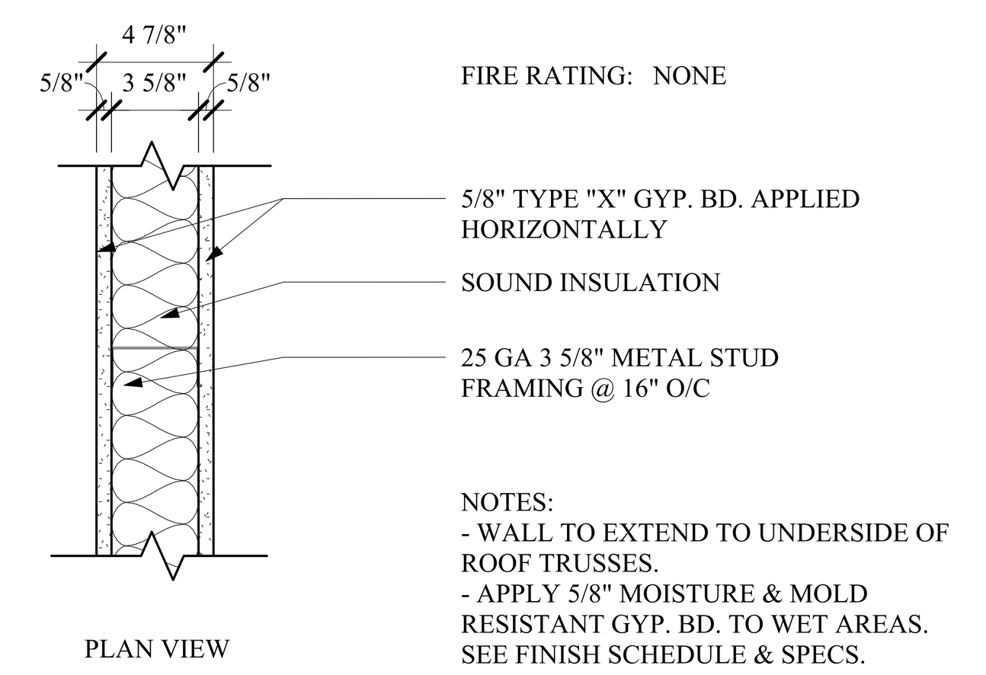
5. Adjust fume hoods, hood exhaust fans, and building's HVAC system, or replace hoods and make other corrections until tested hoods perform as specified.
6. After making corrections, retest fume hoods that failed to perform as specified.

7. Adjust fume hoods, hood exhaust fans, and building's HVAC system, or replace hoods and make other corrections until tested hoods perform as specified.
8. After making corrections, retest fume hoods that failed to perform as specified.

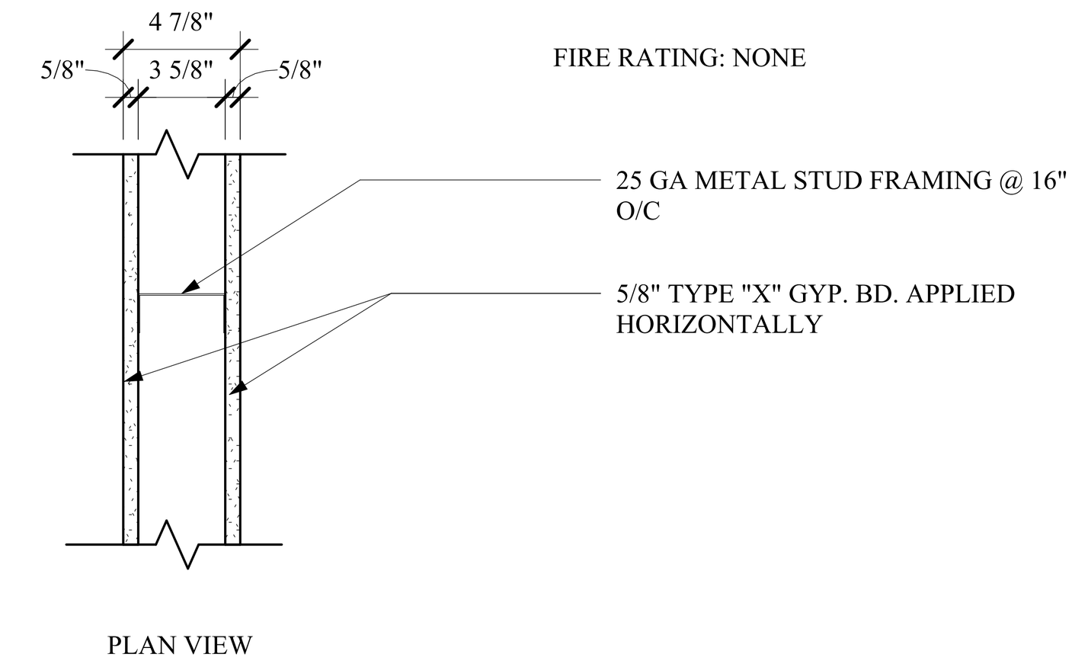
END OF SECTION 115313 – R1



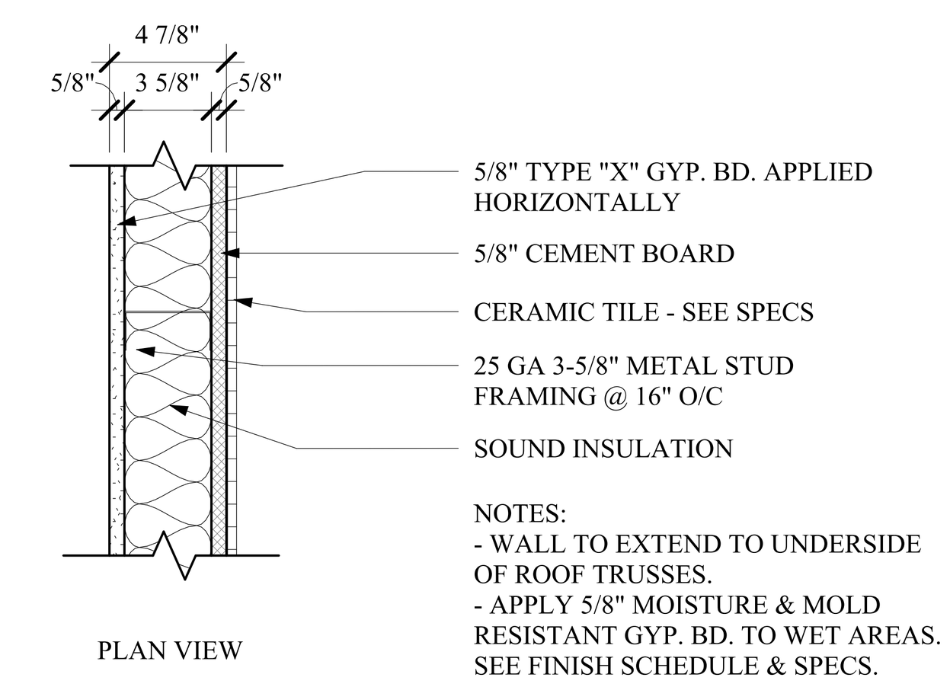
A EXTERIOR WALL TYPE
SCALE: 1" = 1'-0"



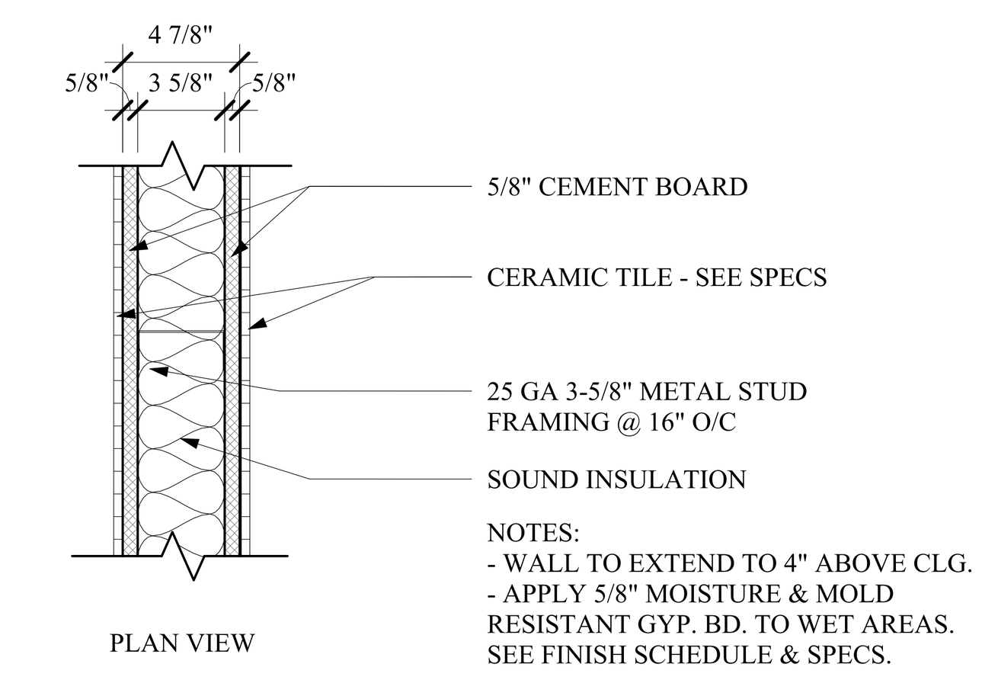
B INTERIOR WALL TYPE
SCALE: 1 1/2" = 1'-0"



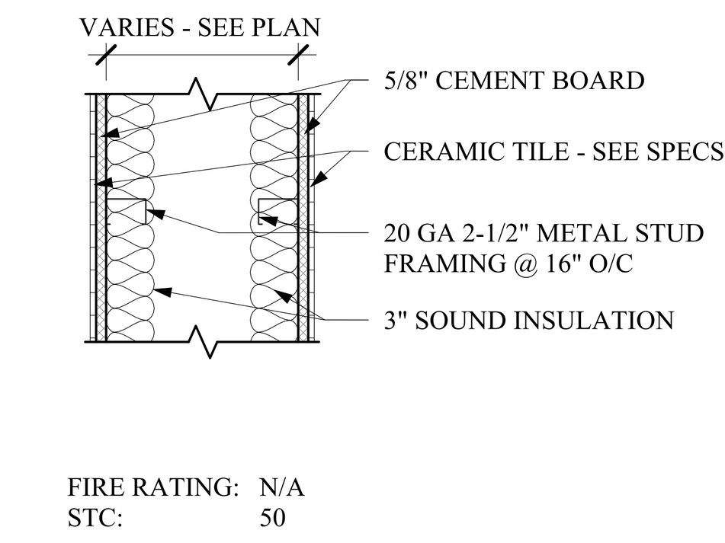
C INTERIOR WALL TYPE
SCALE: 1 1/2" = 1'-0"



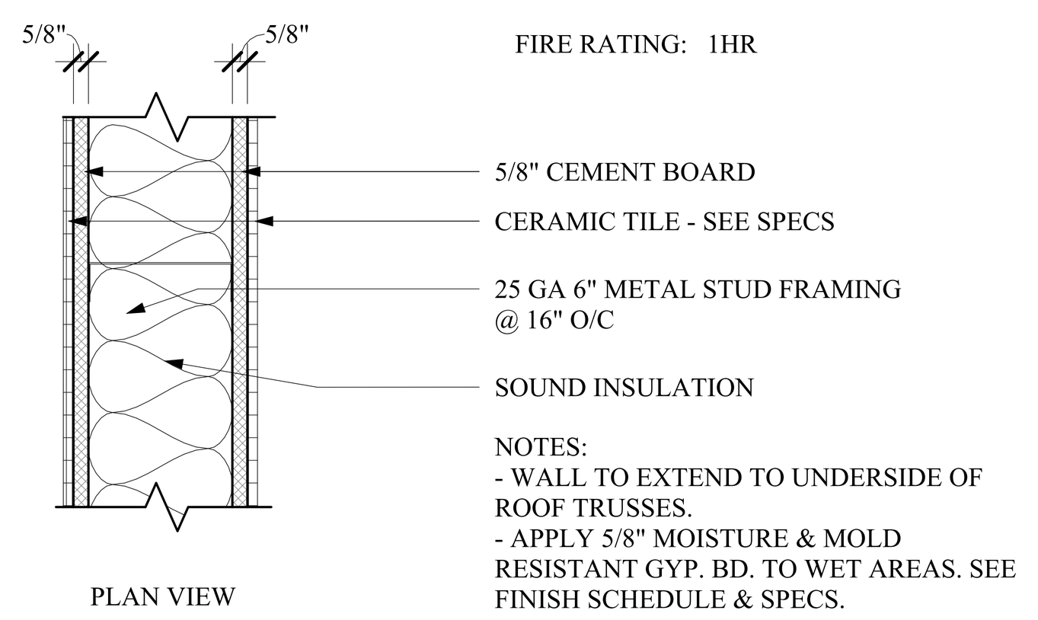
D INTERIOR WALL TYPE
SCALE: 1 1/2" = 1'-0"



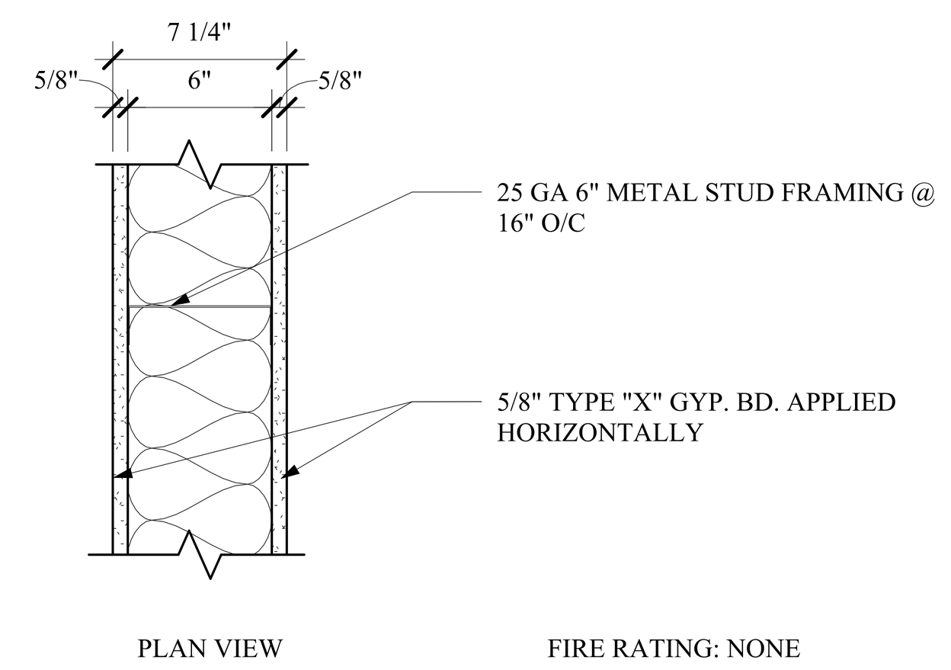
E INTERIOR WALL TYPE
SCALE: 1 1/2" = 1'-0"



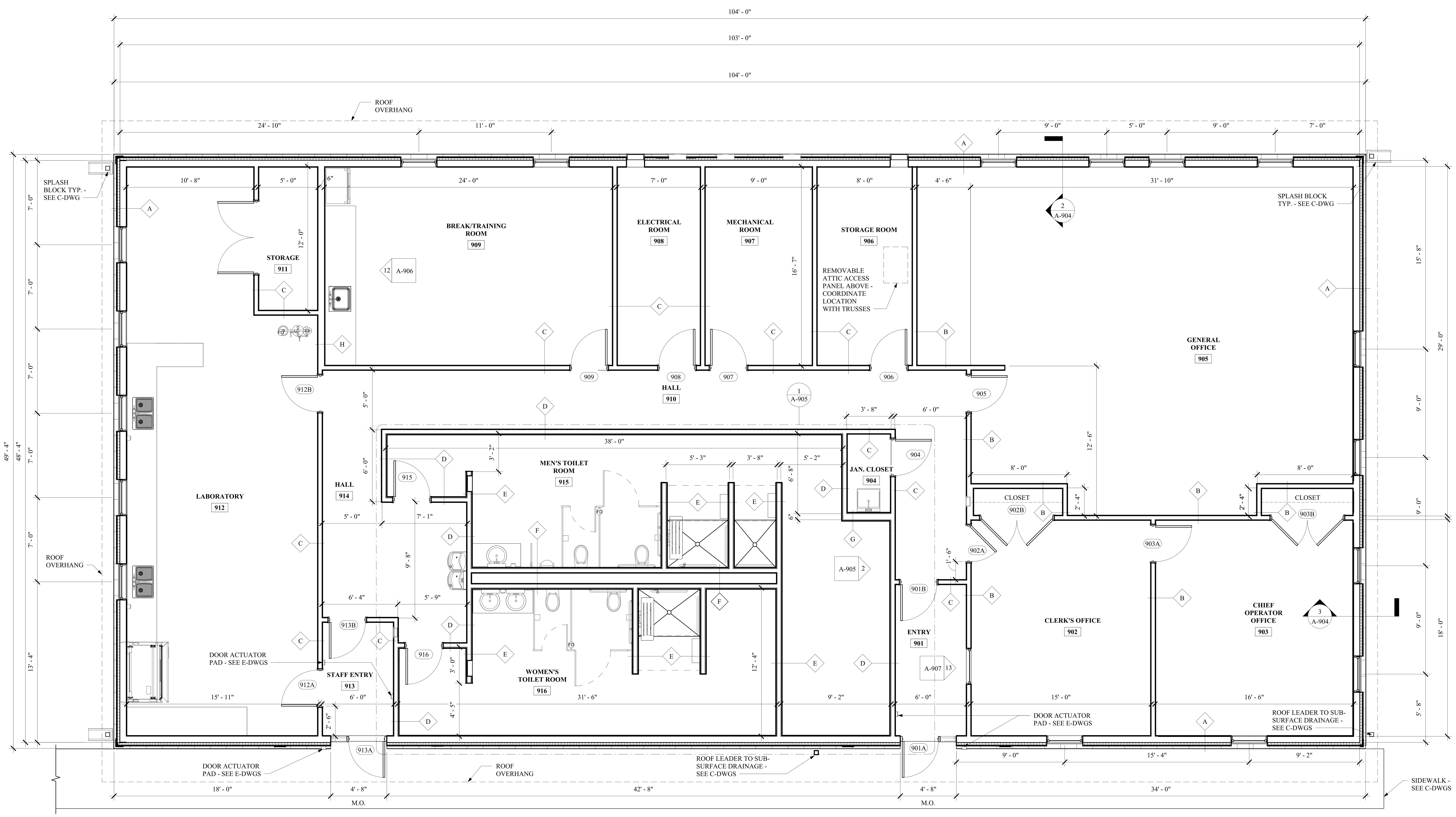
F INTERIOR WALL TYPE
SCALE: 1" = 1'-0"



G INTERIOR WALL TYPE
SCALE: 1 1/2" = 1'-0"



H INTERIOR WALL TYPE
SCALE: 1 1/2" = 1'-0"



FLOOR PLAN
SCALE: 1/4" = 1'-0"

0' 5' 10' 20'

PROJECT NORTH

TRUE NORTH

MHE ENGINEERING
33 Airport Center Drive, Suite 202
New Windsor, NY 12553
(845) 567-3100
111 Wheatfield Drive, Suite 1
Milford, PA 18337
(570) 296-2765

BID SET

UDIG-NY SAFE DIGGING STARTS HERE CALL 811

CAESARS LANE WWTP EXPANSION PROJECT: PHASE 1
145 CAESARS LN.
NEW WINDSOR, NY 12553
FOR TOWN OF NEW WINDSOR
555 UNION AVE.
NEW WINDSOR, NY 12553

CONTROL BUILDING - FLOOR PLAN & WALL TYPES

REVISIONS

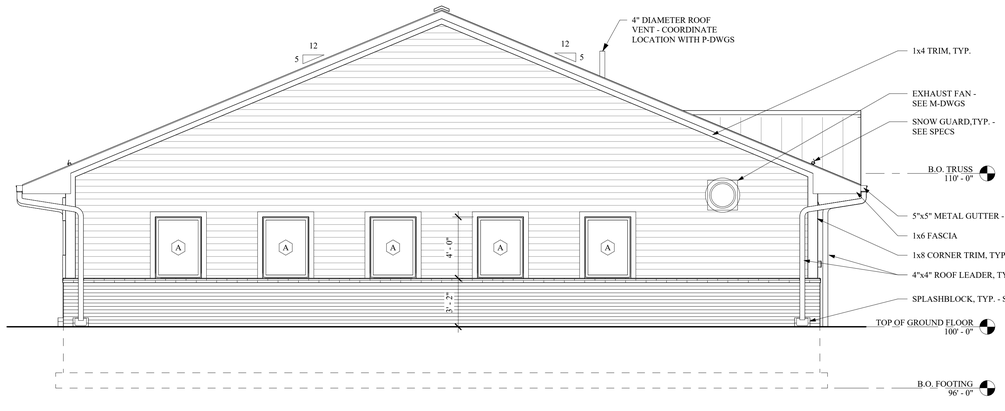
NO.	DESCRIPTION	DATE
1	REV PER ADDENDUM 2	1/16/2025

ISSUED DATE:	21 NOV, 2024
DESIGNED BY:	AW
DRAWN BY:	TS, EDIII, CH
CHECKED BY:	AW
REVIEWED BY:	ML

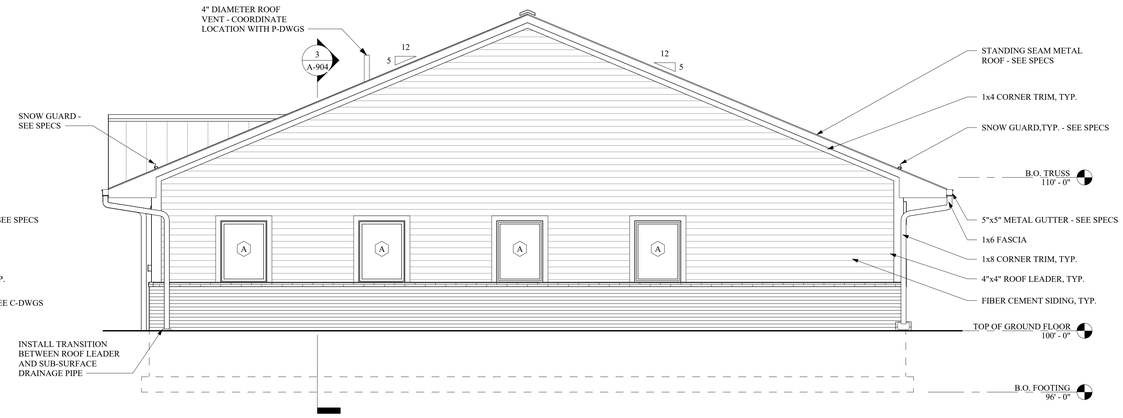
SHEET NO.

A-901

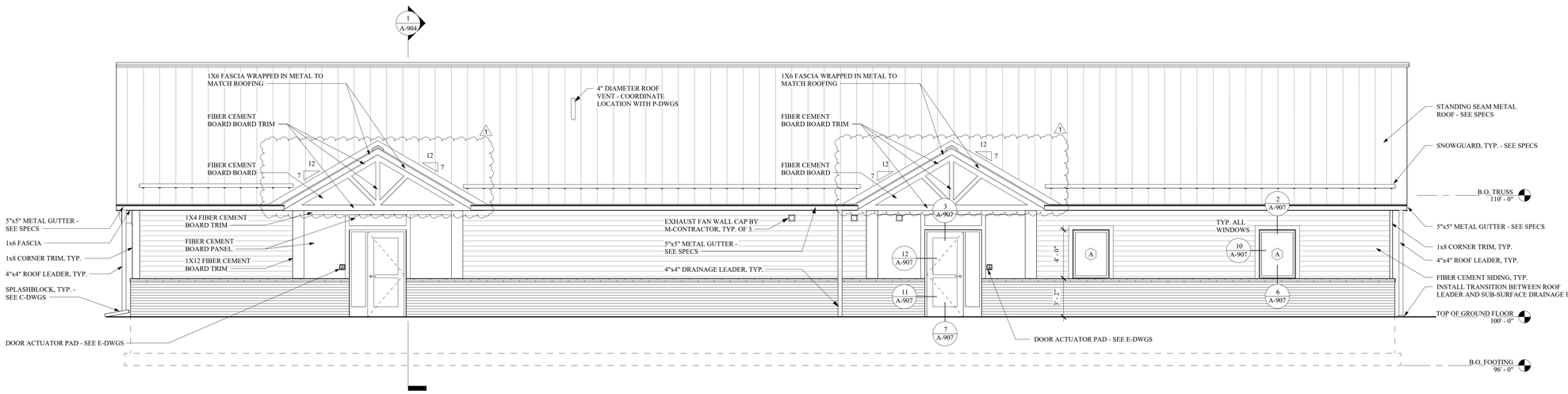
PROJECT # 18-732 PHASE #



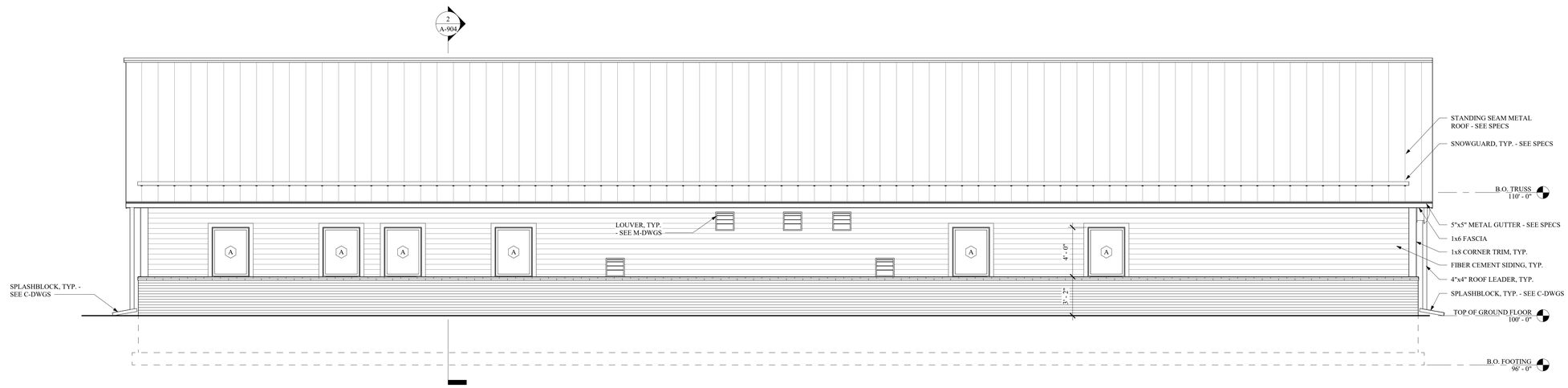
1 A-903 WEST ELEVATION
SCALE: 1/4" = 1'-0"



2 A-903 EAST ELEVATION
SCALE: 1/4" = 1'-0"



3 A-903 SOUTH ELEVATION
SCALE: 1/4" = 1'-0"



4 A-903 NORTH ELEVATION
SCALE: 1/4" = 1'-0"

MHE ENGINEERING
33 Airport Center Drive, Suite 202
New Windsor, NY 12553
(845) 567-3100
111 Wheatfield Drive, Suite 1
Milford, PA 18337
(570) 296-2765

BID SET

UDIG·NY SAFE DIGGING STARTS HERE CALL 811

CAESARS LANE WWTP EXPANSION PROJECT: PHASE 1
145 CAESARS LN.
NEW WINDSOR, NY 12553
FOR TOWN OF NEW WINDSOR
555 UNION AVE.
NEW WINDSOR, NY 12553

CONTROL BUILDING - EXTERIOR ELEVATIONS

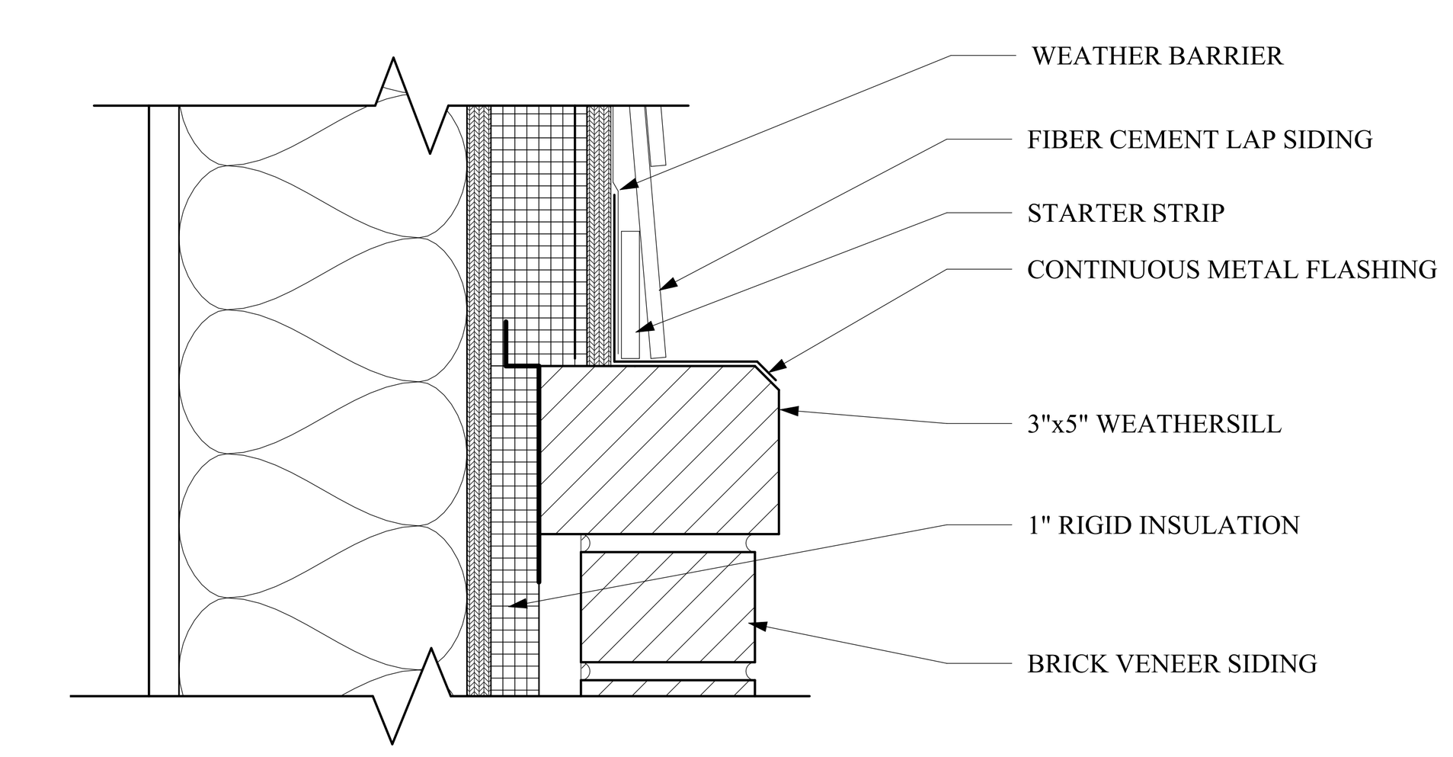
REVISIONS

NO.	DESCRIPTION	DATE
1	REV PER ADDENDUM 2	1/16/2025

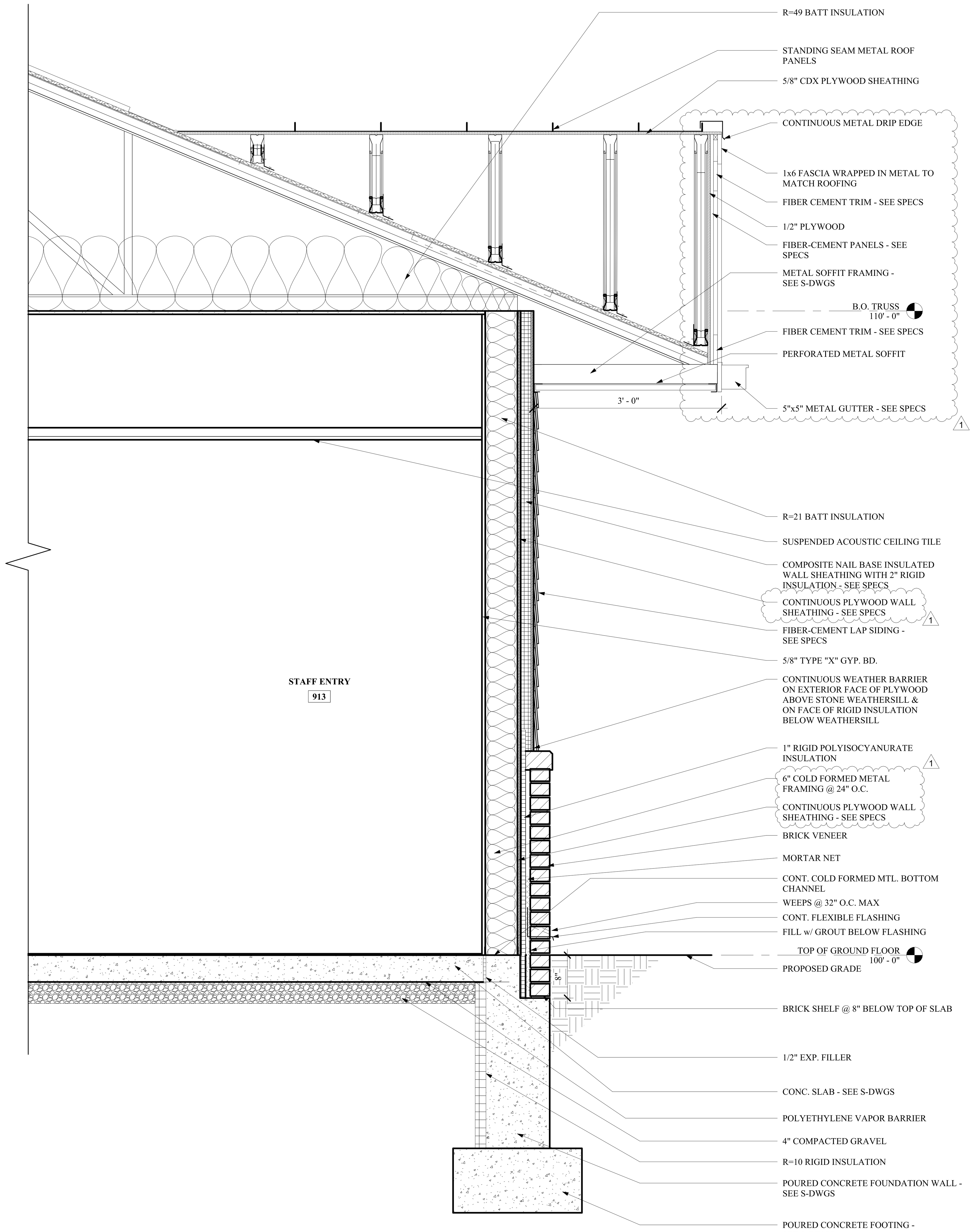
ISSUED DATE:	21 NOV, 2024
DESIGNED BY:	AW
DRAWN BY:	TS, EDIII, CH
CHECKED BY:	AW
REVIEWED BY:	ML

SHEET NO.
A-903

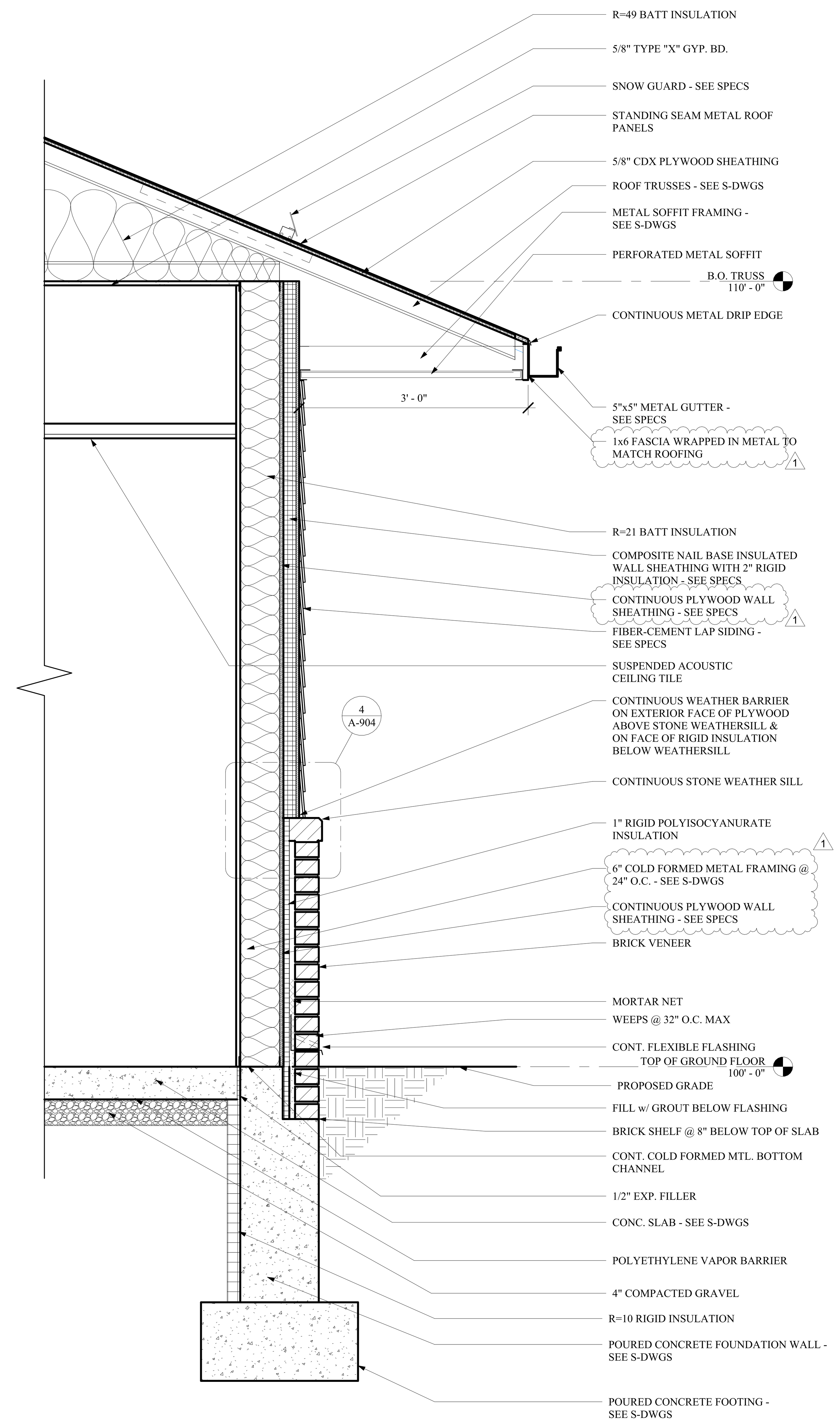
PROJECT # 18-732 PHASE #



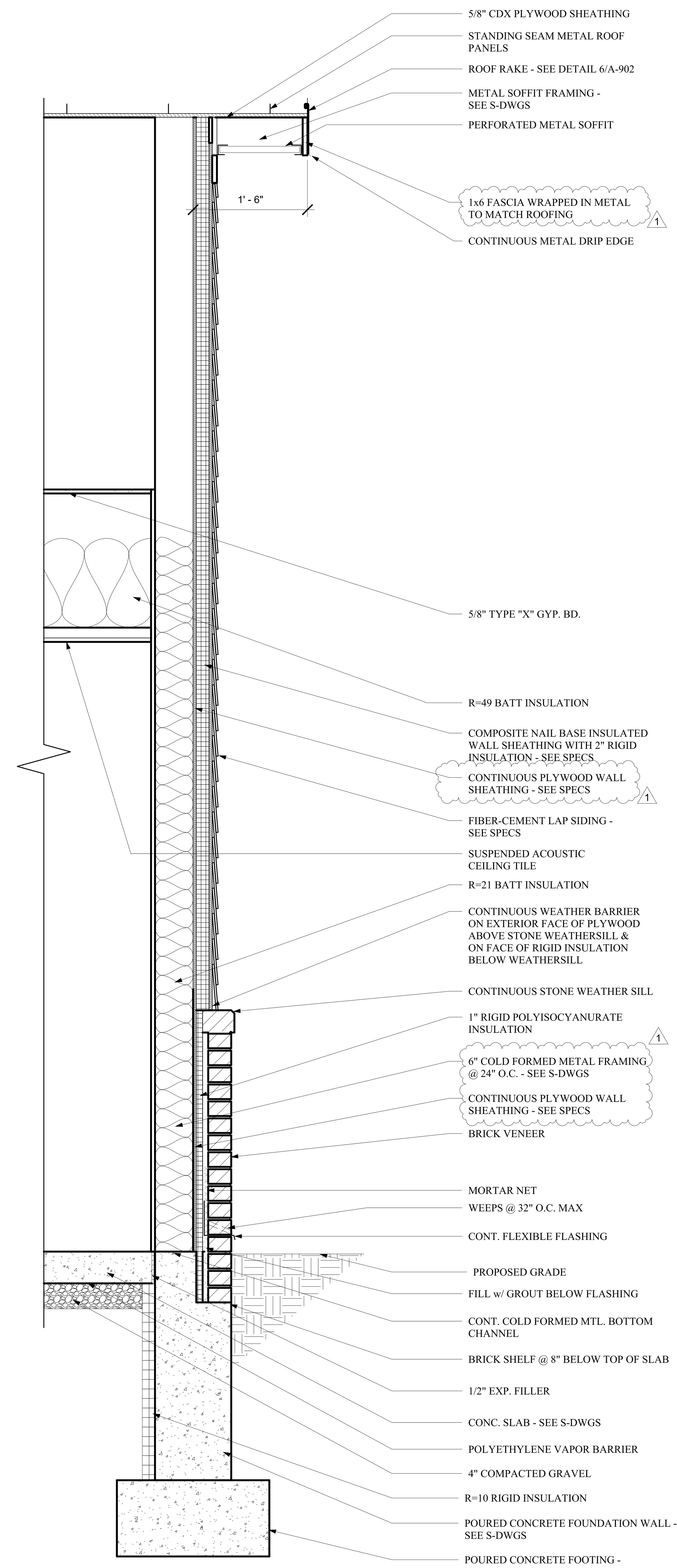
4 A-904 WEATHERSILL DETAIL, TYP.
SCALE: 3" = 1'-0"



1 A-904 TYPICAL DORMER SECTION
SCALE: 1" = 1'-0"



2 A-904 TYPICAL WALL SECTION
SCALE: 1" = 1'-0"



3 A-904 TYPICAL GABLE SECTION
SCALE: 1" = 1'-0"

MHE ENGINEERING
33 Airport Center Drive, Suite 202
New Windsor, NY 12553
(845) 567-3100
111 Wheatfield Drive, Suite 1
Milford, PA 18337
(570) 296-2765

BID SET

UDIG·NY SAFE DIGGING STARTS HERE CALL 811

CAESARS LANE WWTP EXPANSION PROJECT: PHASE 1
145 CAESARS LN.
NEW WINDSOR, NY 12553
FOR TOWN OF NEW WINDSOR
555 UNION AVE.
NEW WINDSOR, NY 12553

CONTROL BUILDING - SECTIONS

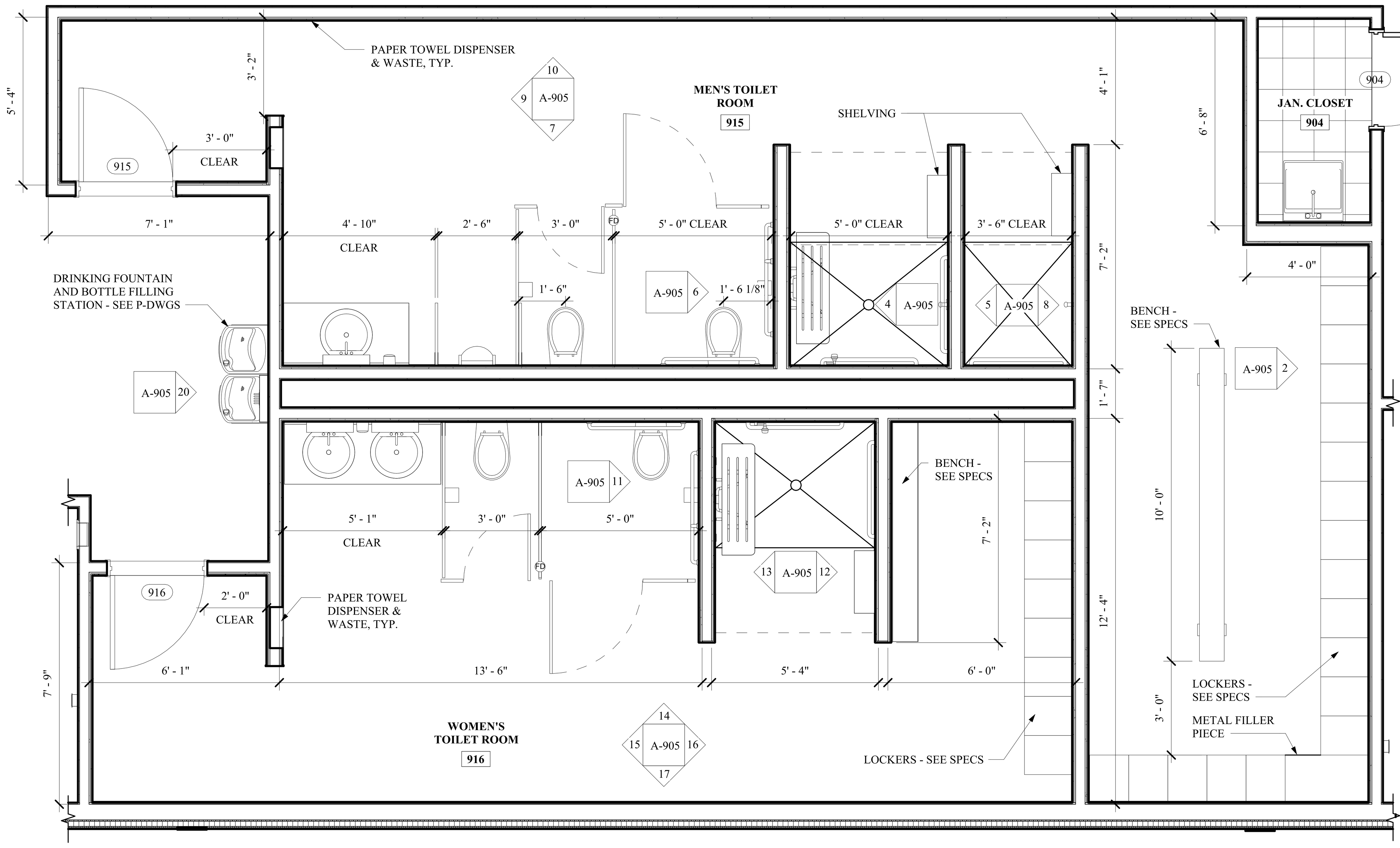
REVISIONS

NO.	DESCRIPTION	DATE
1	REV PER ADDENDUM 2	1/16/2025

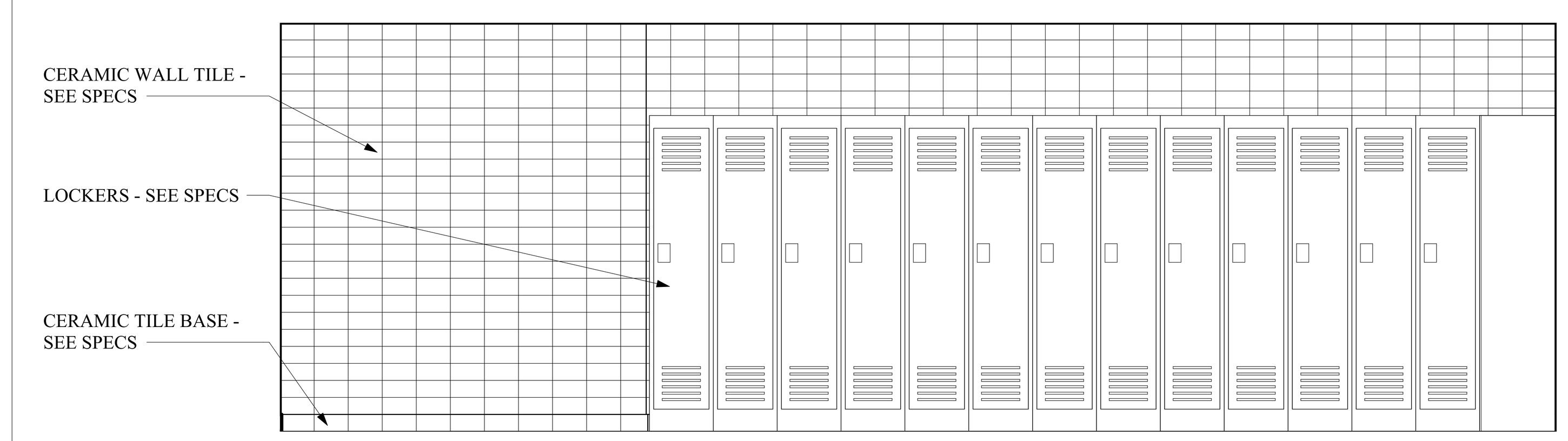
ISSUED DATE:	21 NOV, 2024
DESIGNED BY:	AW
DRAWN BY:	TS, EDIII, CH
CHECKED BY:	AW
REVIEWED BY:	ML

SHEET NO.
A-904

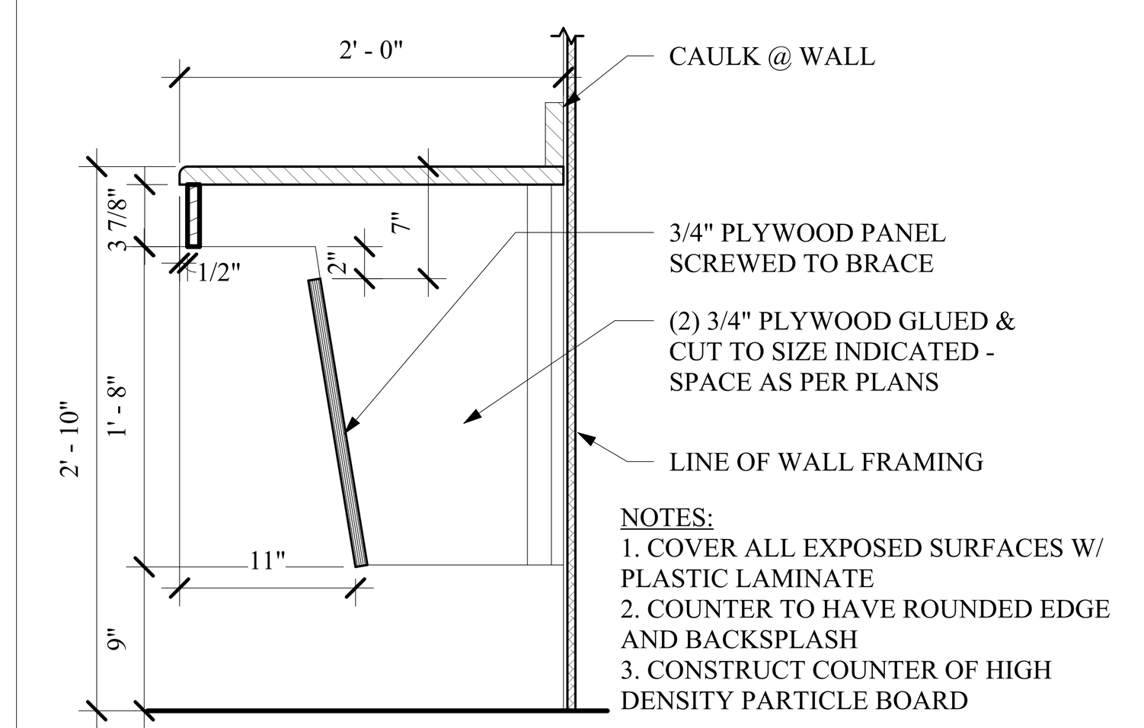
PROJECT # 18-732 PHASE #



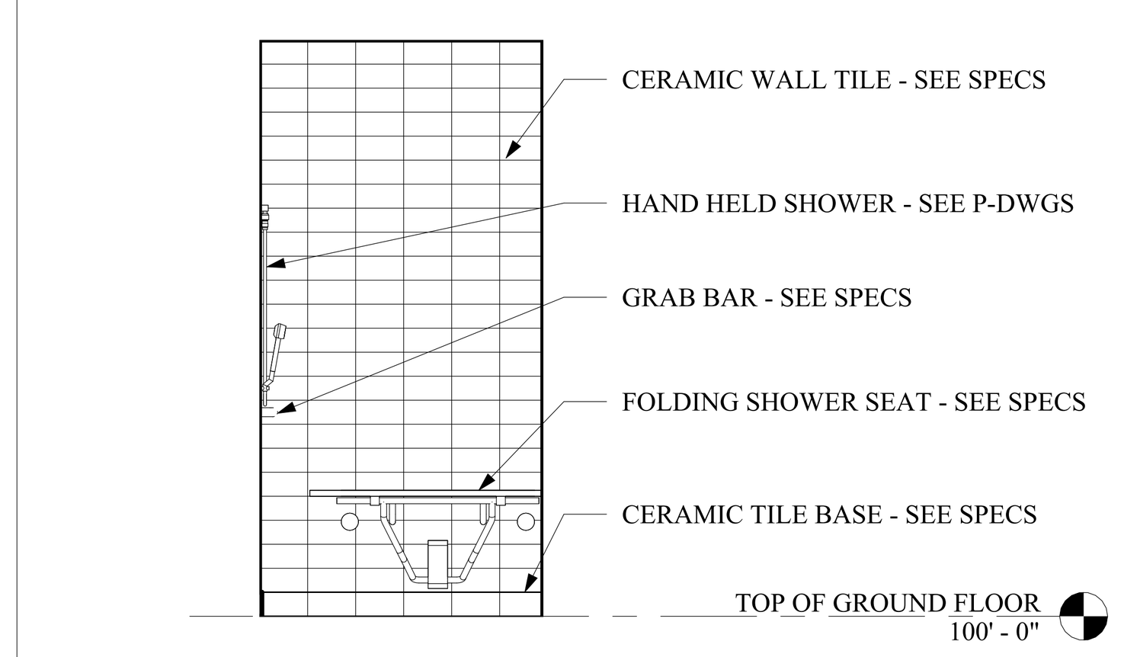
1 A-905 MEN'S TOILET ROOM PLAN
SCALE: 3/8" = 1'-0"



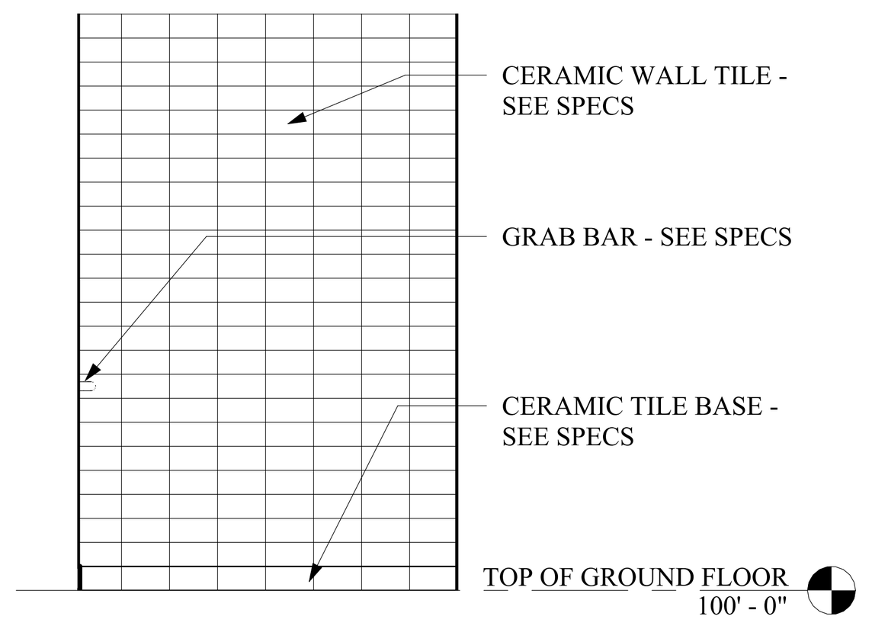
2 A-905 MEN'S LOCKER ROOM ELEVATION
SCALE: 3/8" = 1'-0"



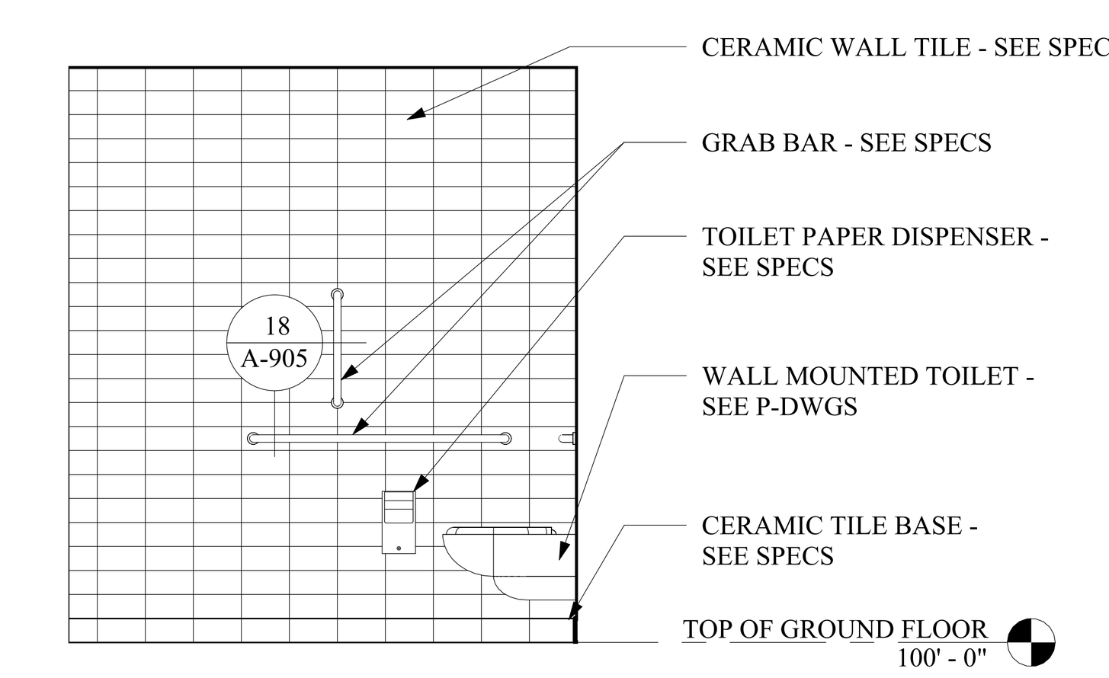
3 A-905 LAVATORY COUNTER DETAIL, TYP.
SCALE: 1" = 1'-0"



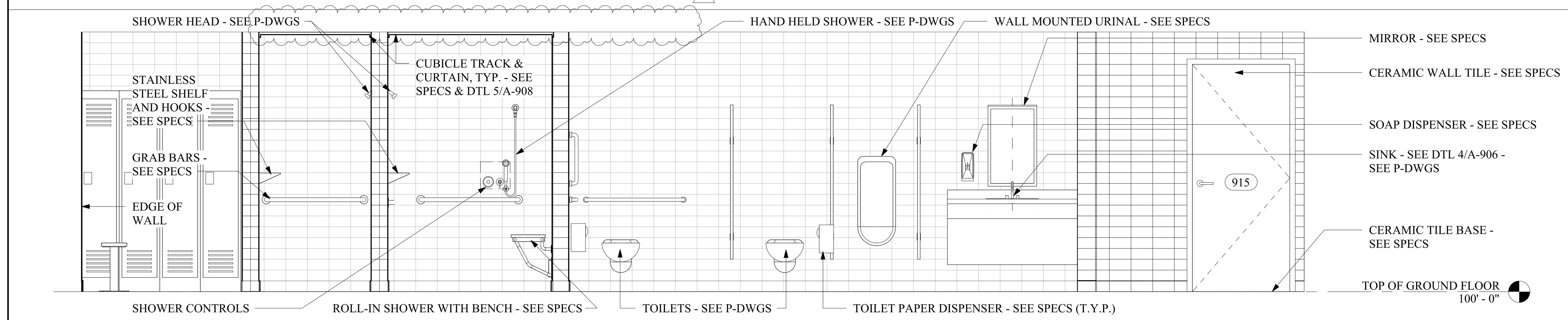
4 A-905 MEN'S SHOWER ELEVATION
SCALE: 3/8" = 1'-0"



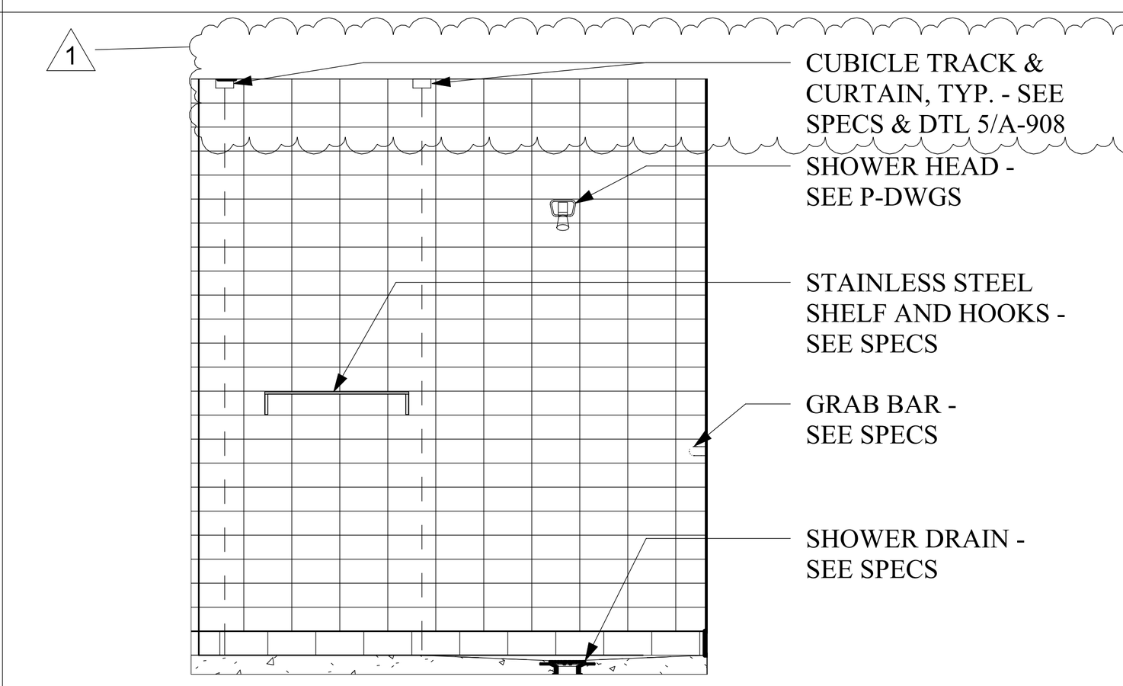
5 A-905 MEN'S SHOWER ELEVATION
SCALE: 3/8" = 1'-0"



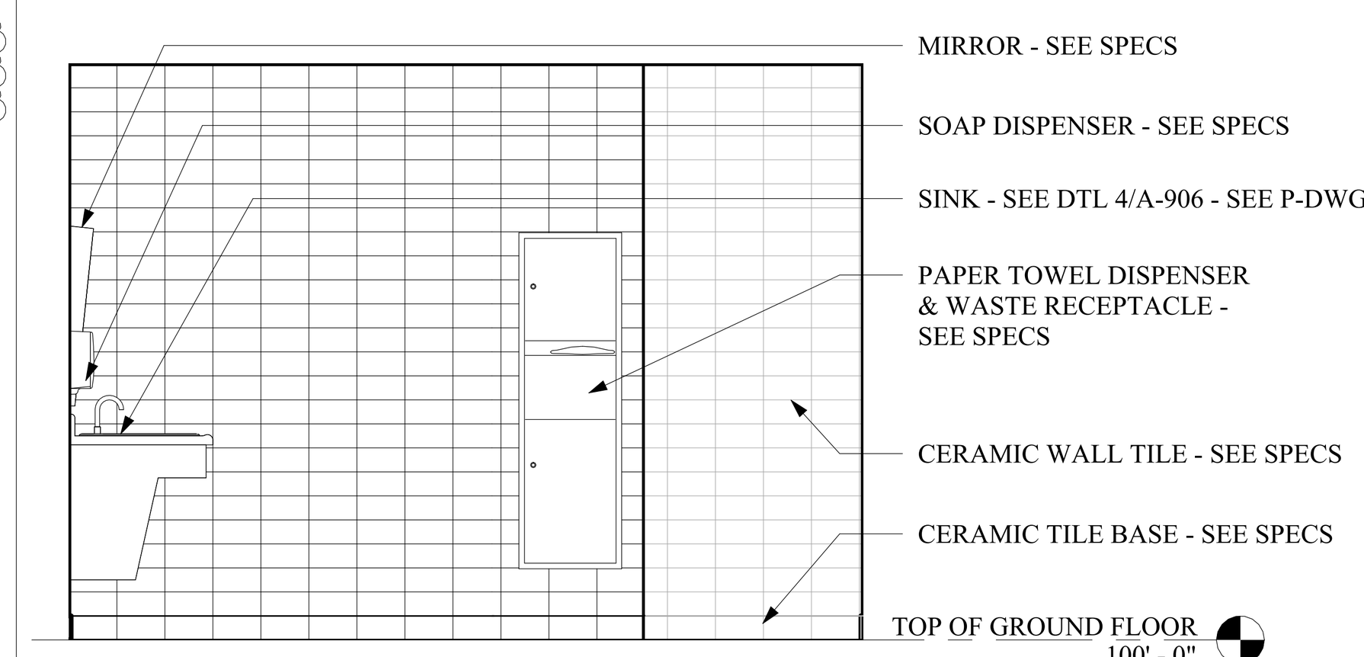
6 A-905 MEN'S TOILET ROOM ELEVATION
SCALE: 3/8" = 1'-0"



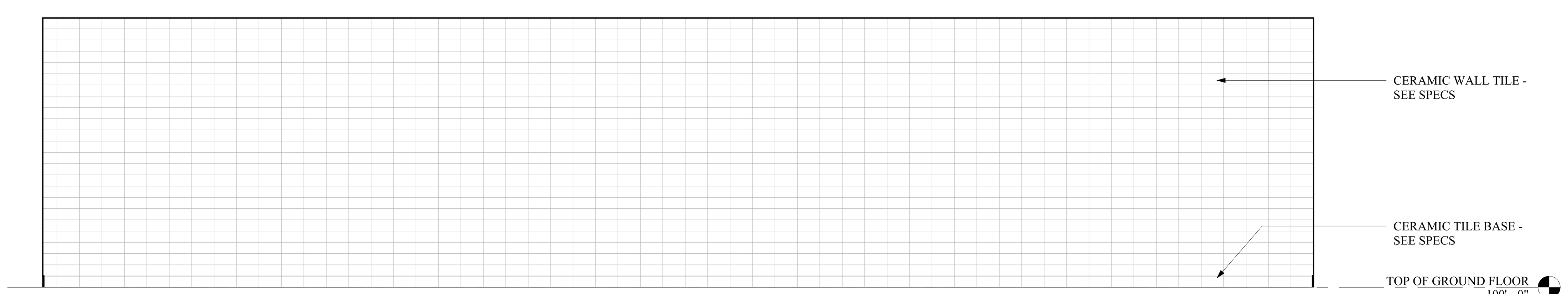
7 A-905 MEN'S TOILET ROOM ELEVATION
SCALE: 3/8" = 1'-0"



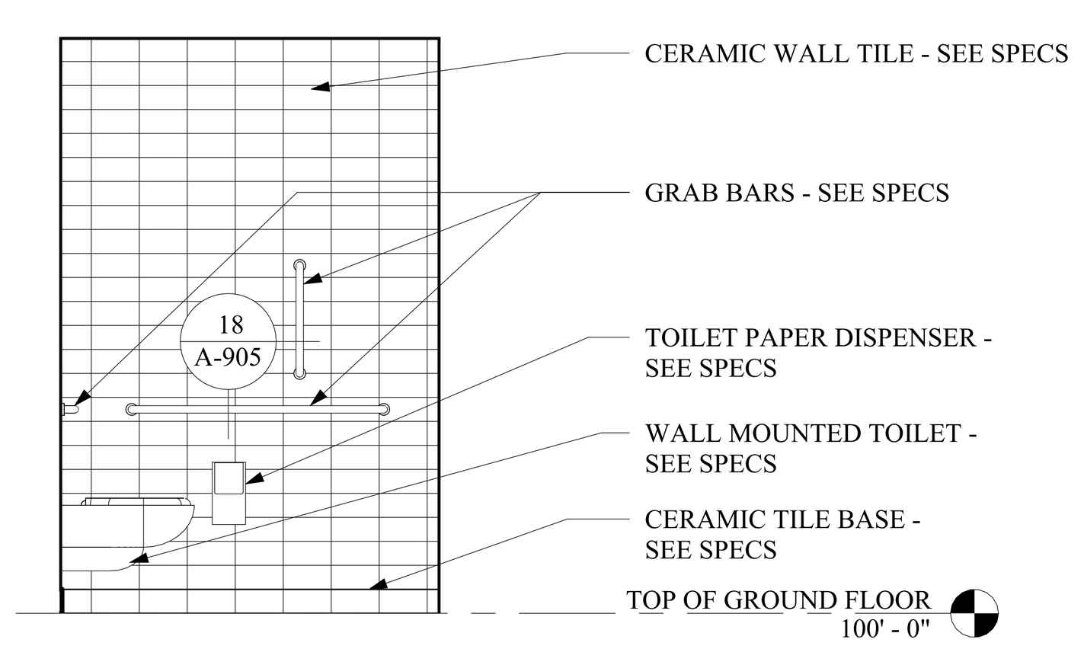
8 A-905 MEN'S TOILET ROOM ELEVATION
SCALE: 3/8" = 1'-0"



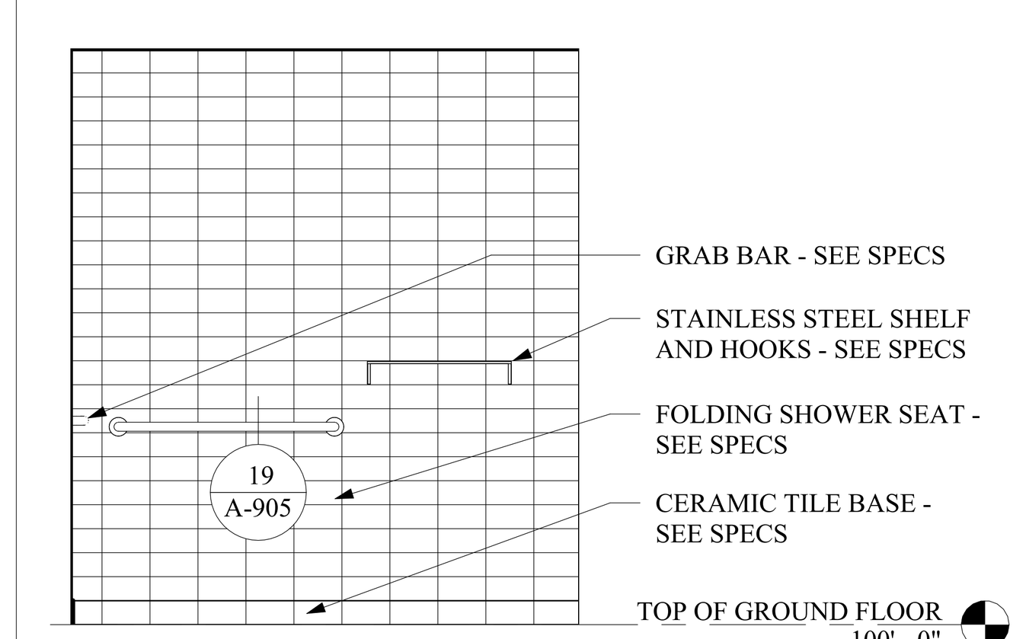
9 A-905 MEN'S TOILET ROOM ELEVATION
SCALE: 3/8" = 1'-0"



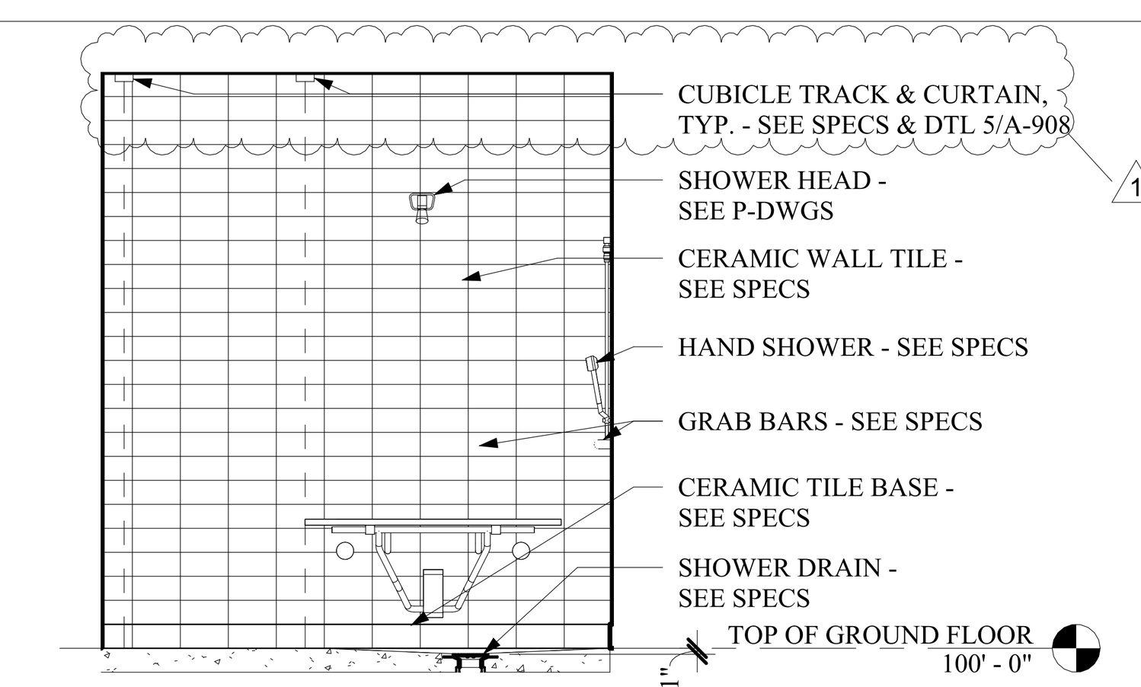
10 A-905 MEN'S TOILET ROOM ELEVATION
SCALE: 3/8" = 1'-0"



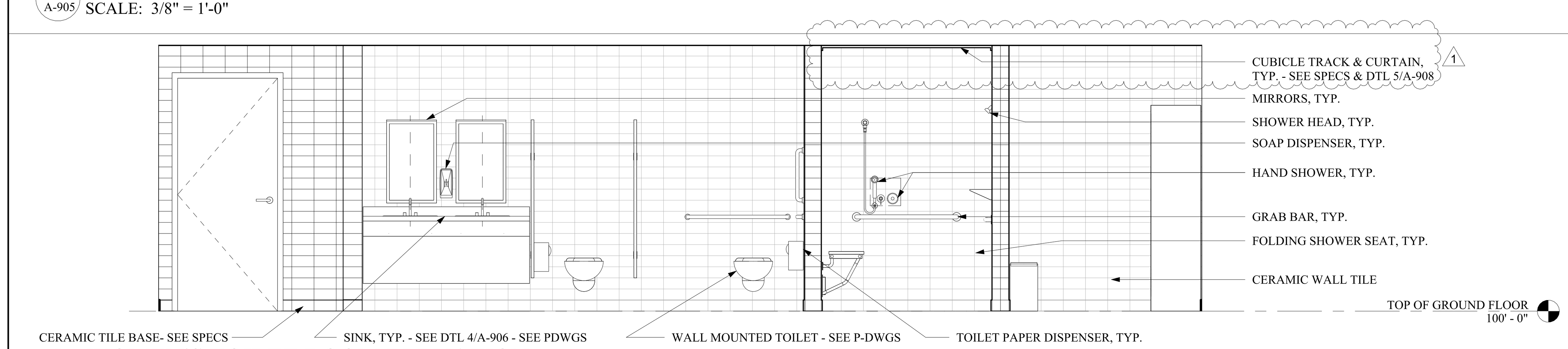
11 A-905 WOMEN'S TOILET ROOM ELEVATION
SCALE: 3/8" = 1'-0"



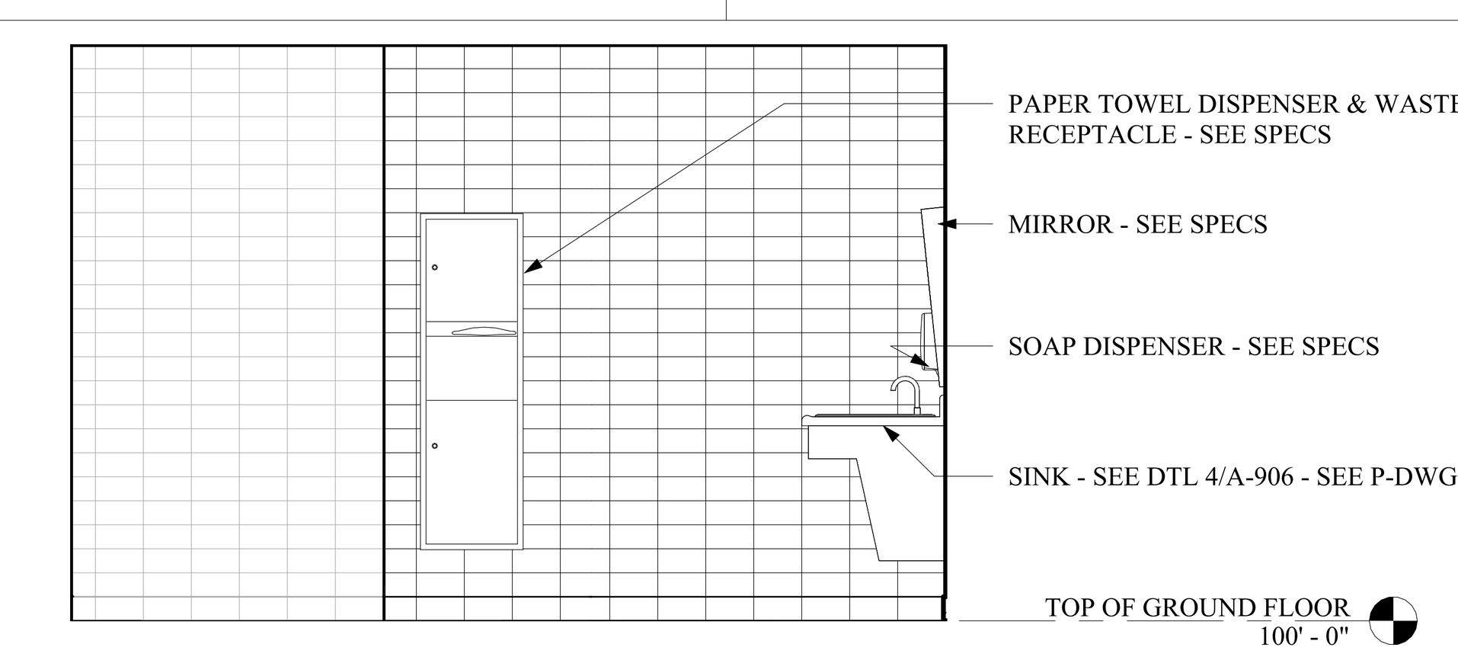
12 A-905 WOMEN'S SHOWER ELEVATION
SCALE: 3/8" = 1'-0"



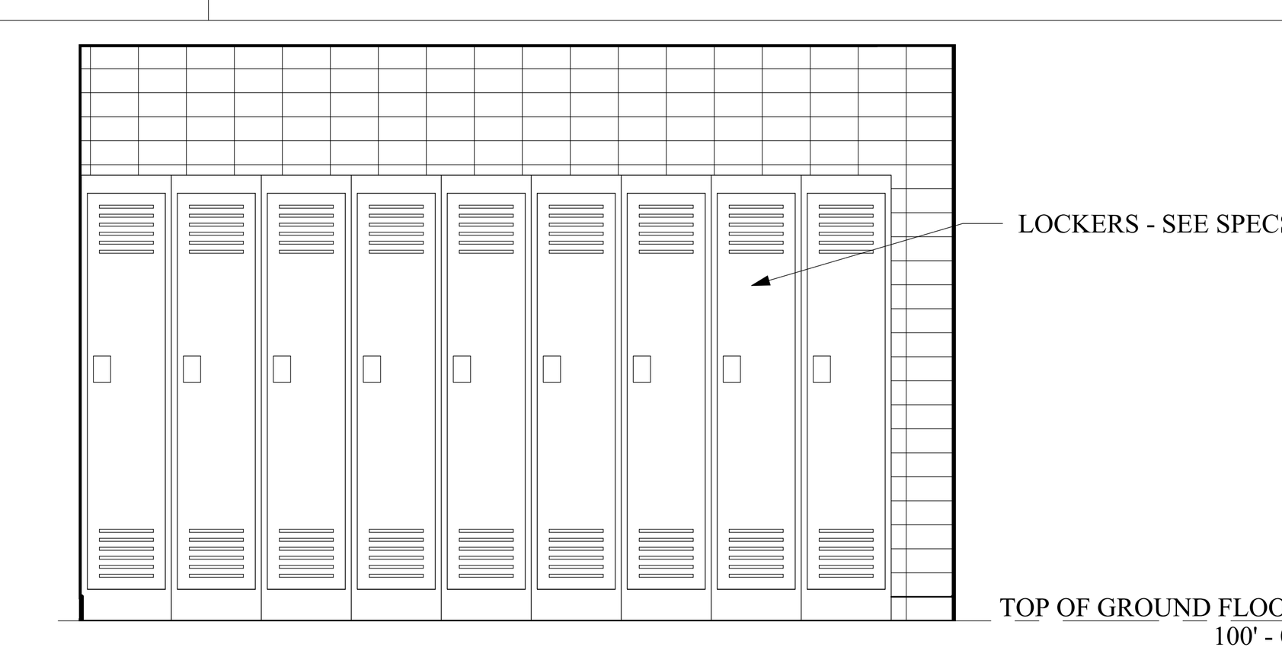
13 A-905 WOMEN'S TOILET ROOM ELEVATION
SCALE: 3/8" = 1'-0"



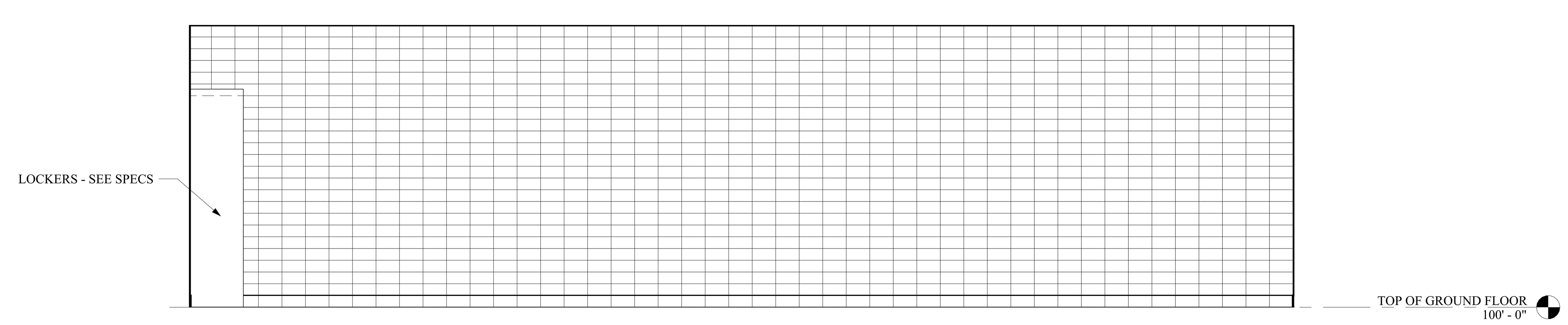
14 A-905 WOMEN'S TOILET ROOM ELEVATION
SCALE: 3/8" = 1'-0"



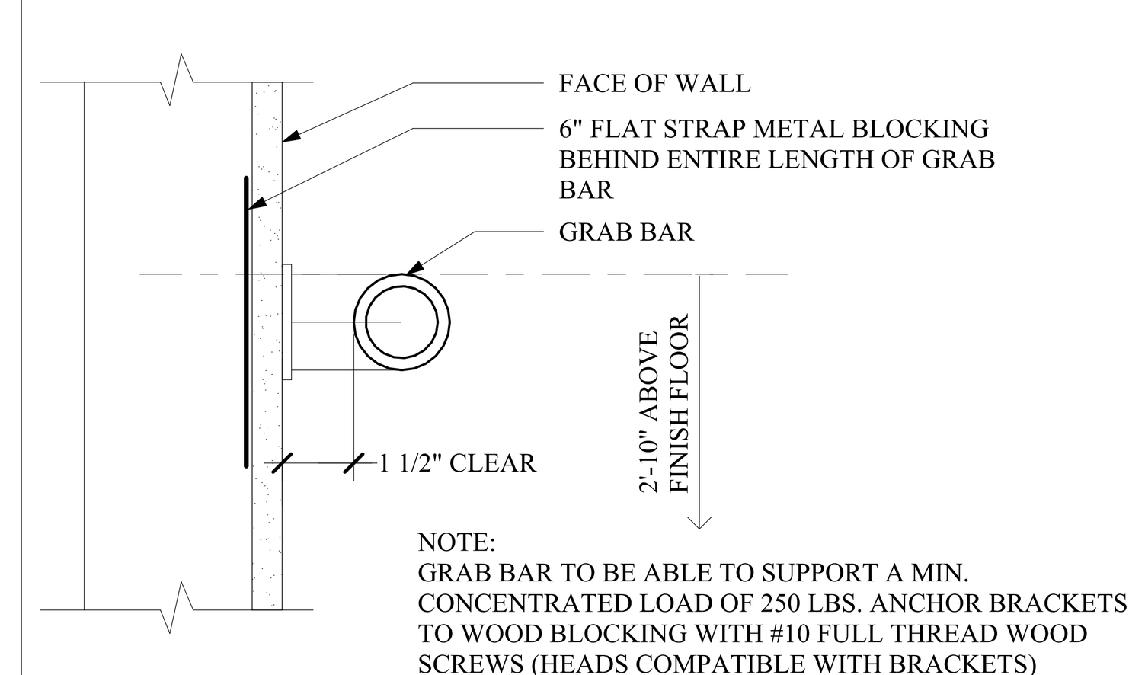
15 A-905 WOMEN'S TOILET ROOM ELEVATION
SCALE: 3/8" = 1'-0"



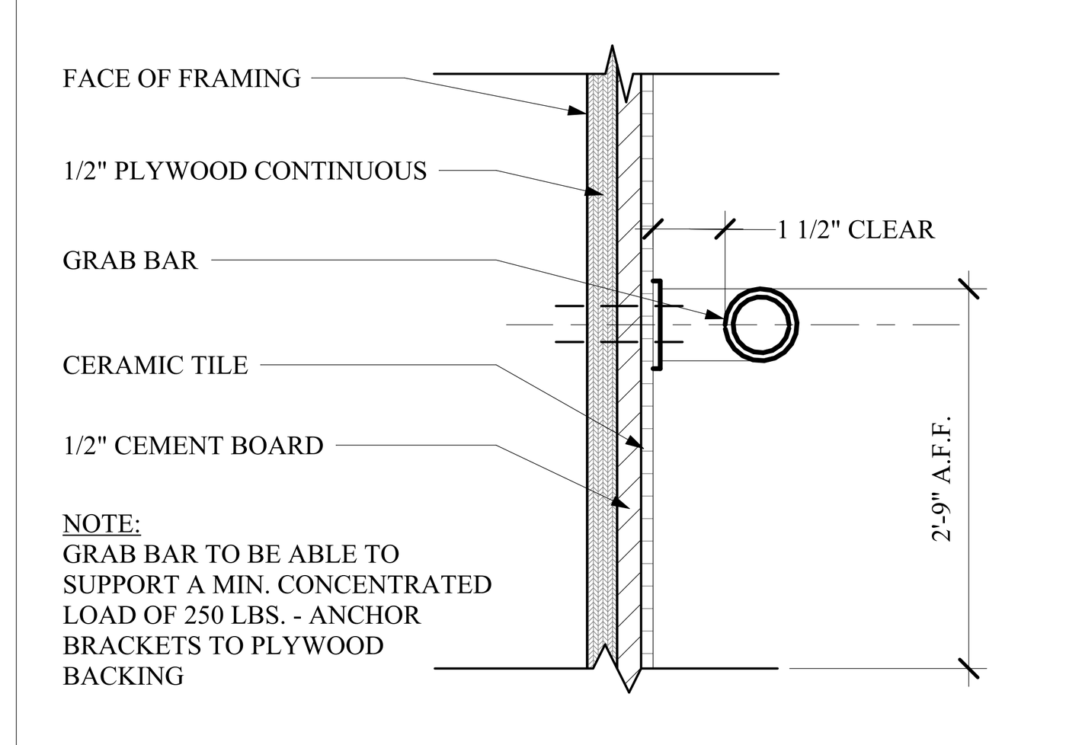
16 A-905 WOMEN'S LOCKER ROOM ELEVATION
SCALE: 3/8" = 1'-0"



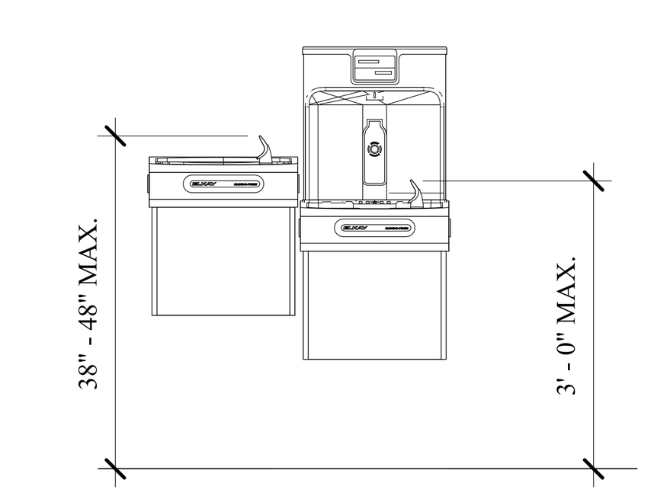
17 A-905 WOMEN'S TOILET ROOM ELEVATION
SCALE: 3/8" = 1'-0"



18 A-905 GRAB BAR DETAIL, TYP.
SCALE: 3" = 1'-0"



19 A-905 GRAB BAR AT SHOWER DETAIL, TYP.
SCALE: 3" = 1'-0"



20 A-905 DRINKING FOUNTAINS
SCALE: 1/2" = 1'-0"

MHE ENGINEERING
33 Airport Center Drive, Suite 202 New Windsor, NY 12553 (845) 567-3100
111 Wheatfield Drive, Suite 1 Milford, PA 18337 (570) 296-2765

BID SET

UDIG-NY SAFE DIGGING STARTS HERE CALL 811

CAESARS LANE WWTP EXPANSION PROJECT: PHASE 1
145 CAESARS LN.
NEW WINDSOR, NY 12553
FOR TOWN OF NEW WINDSOR
555 UNION AVE.
NEW WINDSOR, NY 12553

CONTROL BUILDING - INTERIOR PLAN, ELEVATIONS & DETAILS

REVISIONS

NO.	DESCRIPTION	DATE
1	REV PER ADDENDUM 2	1/16/2025

ISSUED DATE:	21 NOV, 2024
DESIGNED BY:	AW
DRAWN BY:	TS, CH, EDIII
CHECKED BY:	AW
REVIEWED BY:	ML

SHEET NO.
A-905

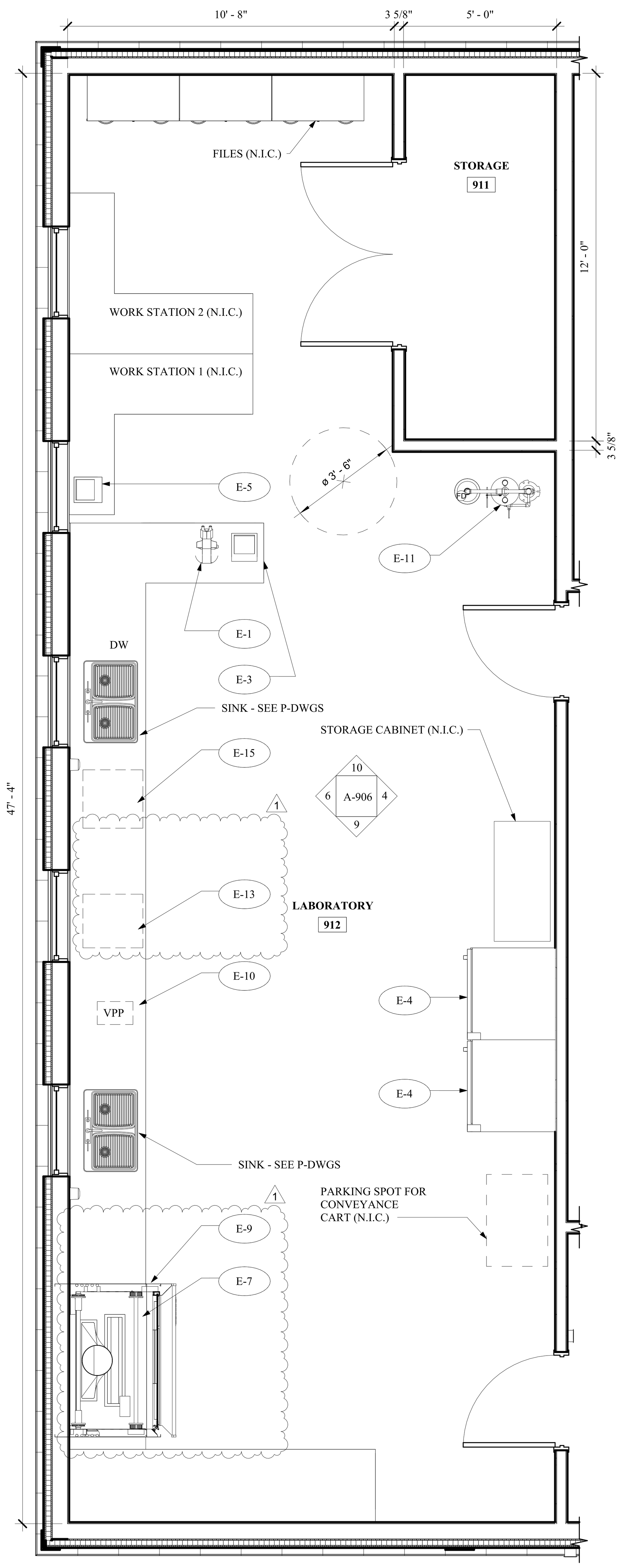
PROJECT # 18-732 PHASE #

EQUIPMENT AND FURNITURE LOCATIONS FOR REFERENCE PURPOSES ONLY

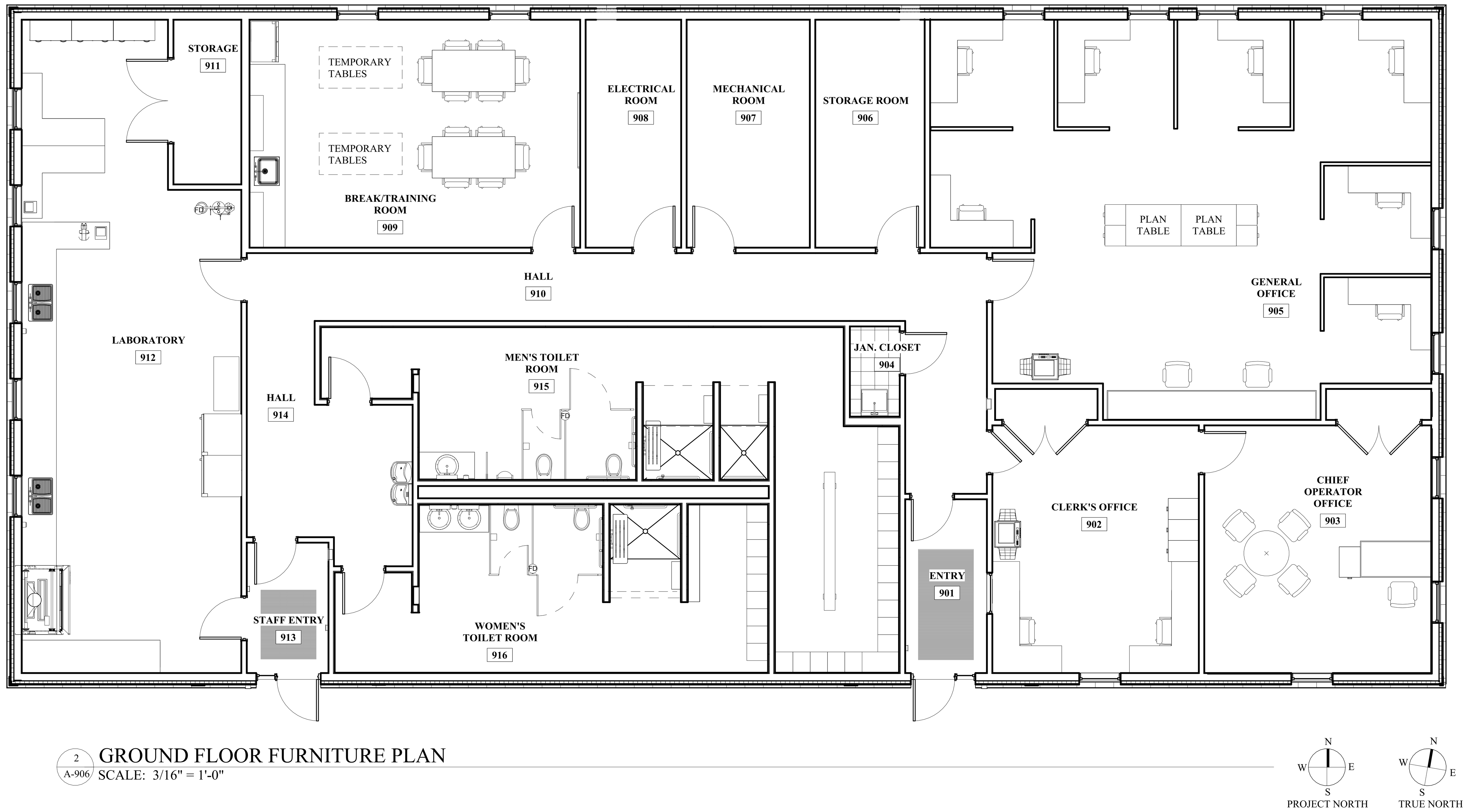
NOT IN CONTRACT UNLESS NOTED OTHERWISE

LAB EQUIPMENT

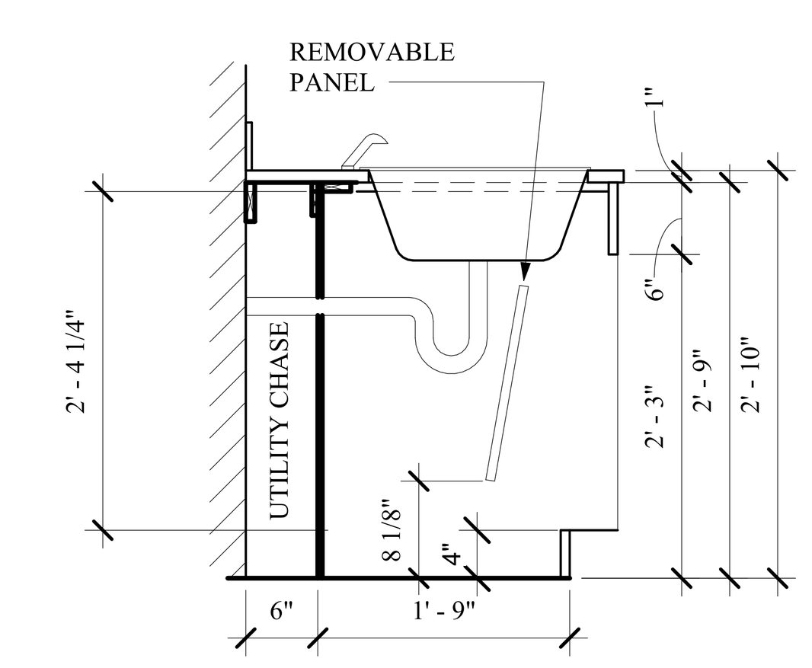
- E-1 MICROSCOPE
- E-2 DO METER
- E-3 BENCH pH METER
- E-4 (2) REFRIGERATOR/ FREEZER BY G.C. - SEE SPECS
- E-5 ANALYTICAL BALANCE
- E-6 MOISTURE DETERMINATION BALANCE
- E-7 DRYING OVEN IN FUME HOOD BY G.C. - SEE SPECS
- E-8 TOP LOADER BALANCE
- E-9 FUME HOOD BY G.C. - SEE SPECS
- E-10 VACUUM PRESSURE PUMP
- E-11 SAFETY SHOWER & EYE WASH - BY P-CONTRACT SEE P-DWGS & SPECS
- E-12 (2) CABINET TYPE DESICCATOR
- E-13 ACID/CORROSIVE CABINET BY G.C. - SEE SPECS
- E-14 COMPOSITE SAMPLERS
- E-15 DISHWASHER - SEE SPECS



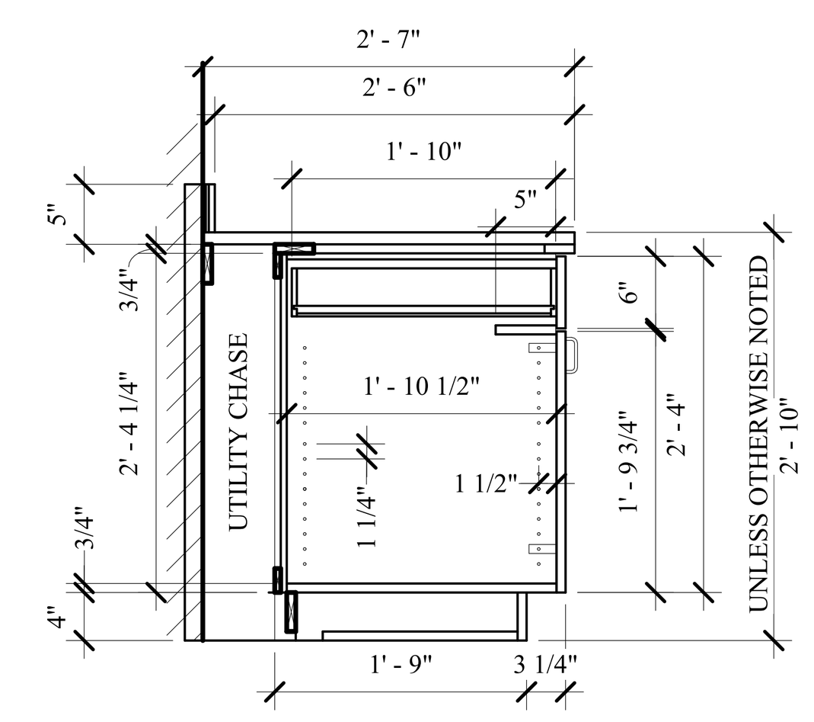
8 LAB FLOOR PLAN
A-906 SCALE: 3/8" = 1'-0"



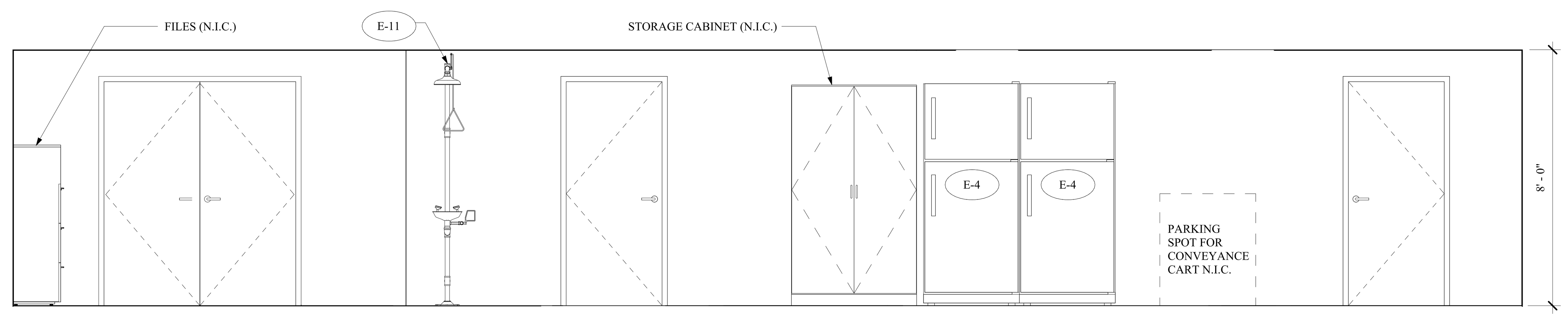
2 GROUND FLOOR FURNITURE PLAN
A-906 SCALE: 3/16" = 1'-0"



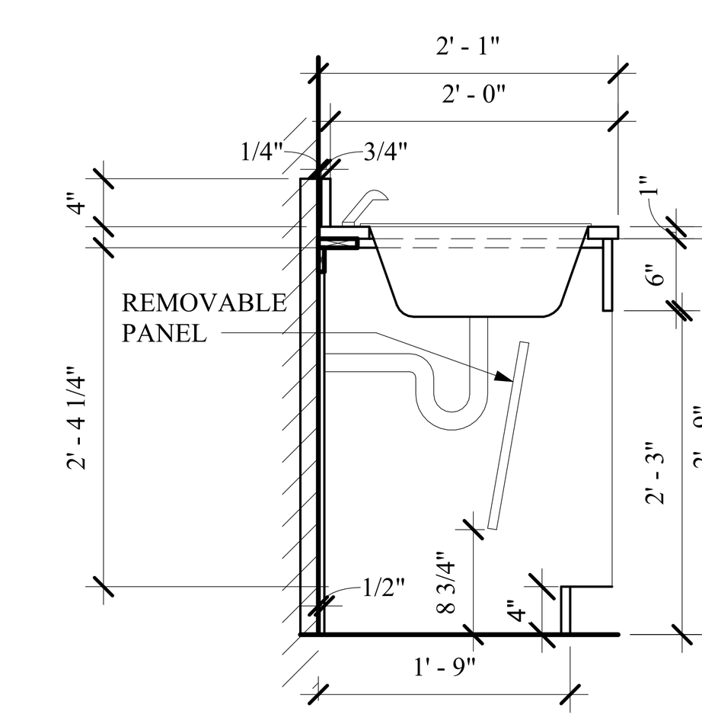
1 METAL LAB CASEWORK @ SINK
A-906 SCALE: 3/4" = 1'-0"



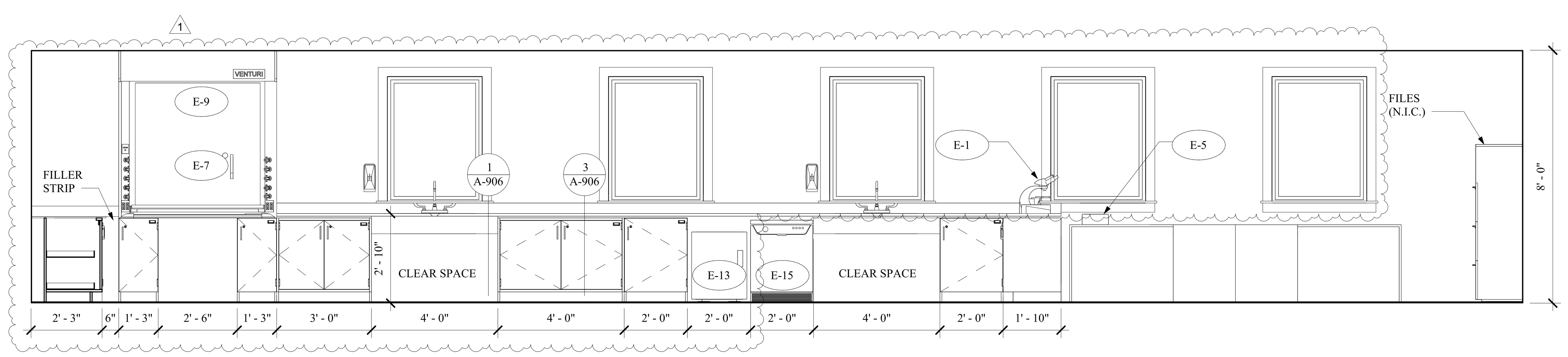
3 METAL LAB CASEWORK DRAWER W/ DOOR
A-906 SCALE: 3/4" = 1'-0"



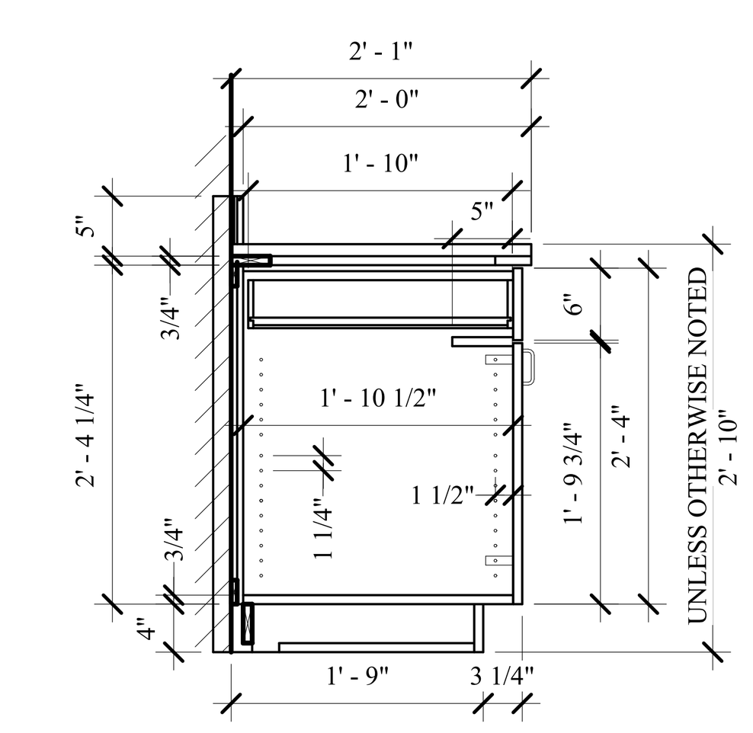
4 LAB ELEVATION
A-906 SCALE: 3/8" = 1'-0"



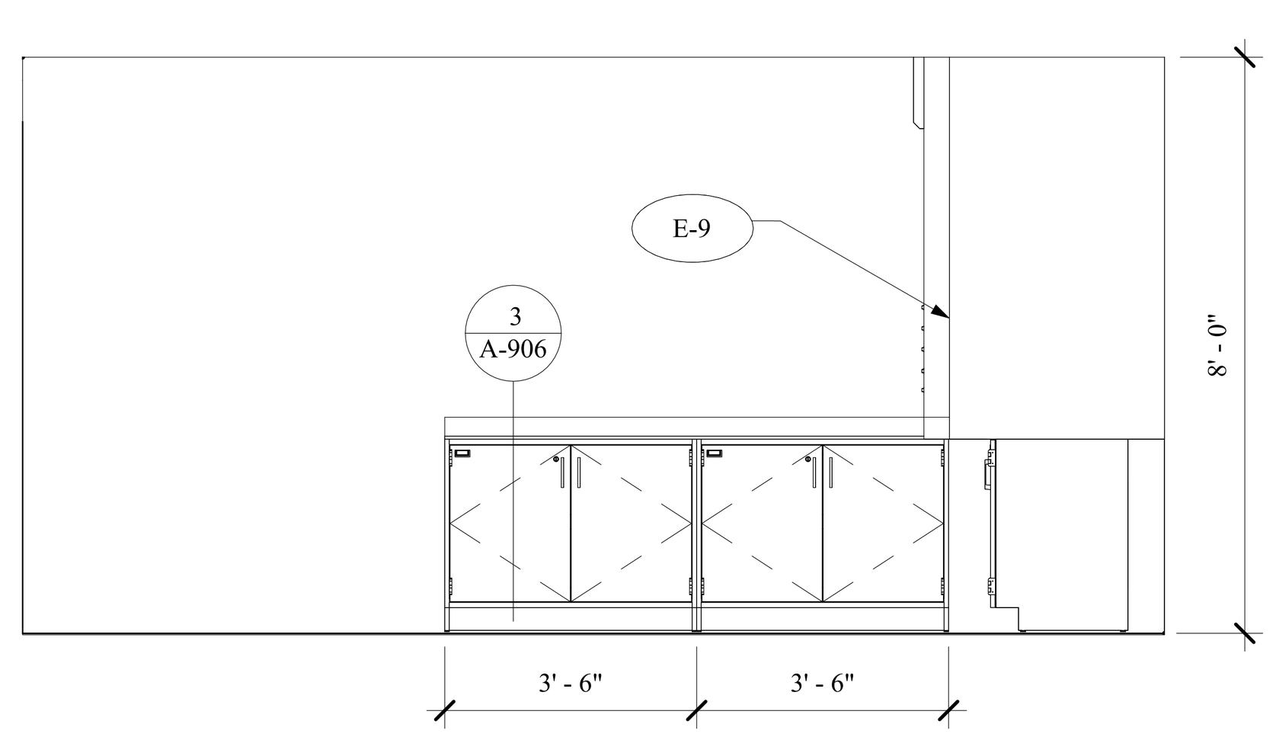
5 WOOD CABINET SINK BASE
A-906 SCALE: 3/4" = 1'-0"



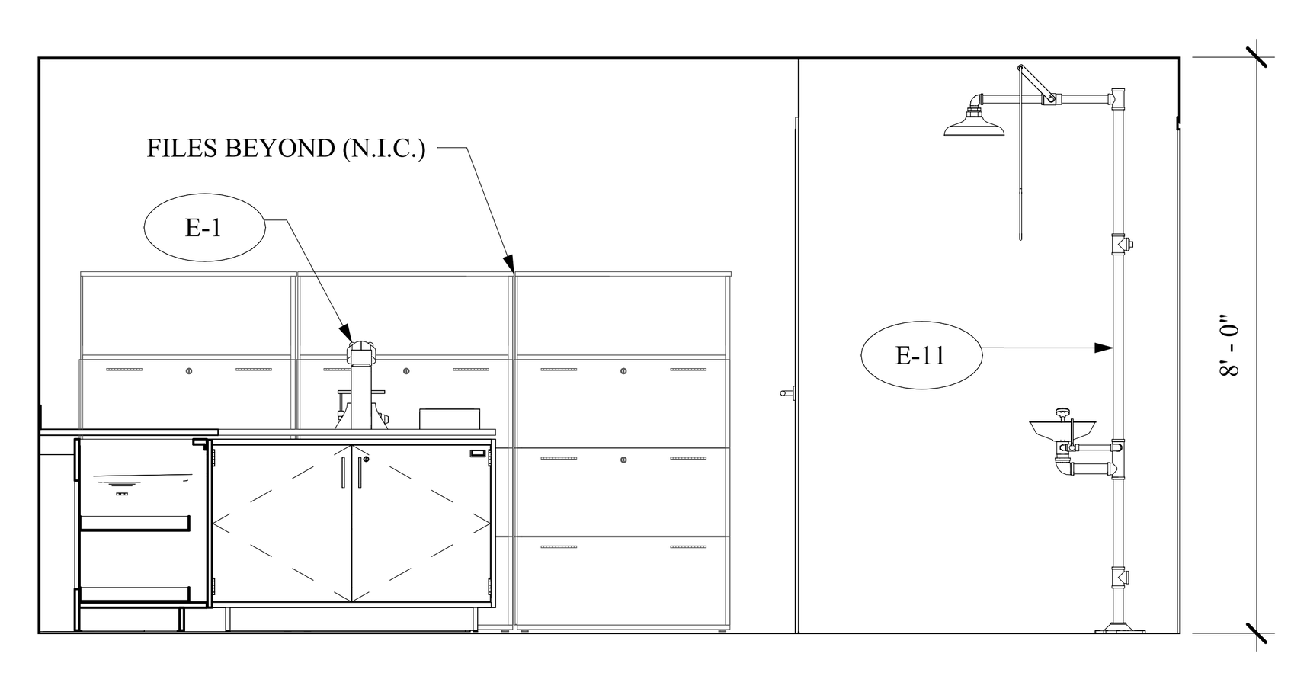
6 LAB ELEVATION
A-906 SCALE: 3/8" = 1'-0"



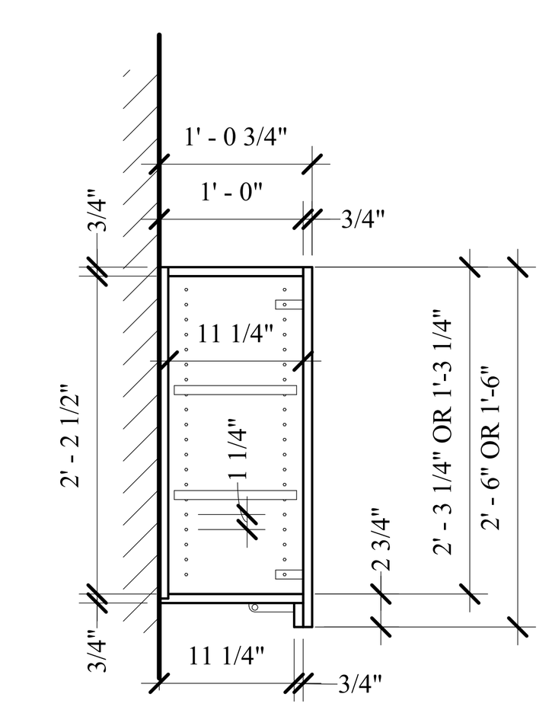
7 WOOD BASE CABINET WITH DOOR
A-906 SCALE: 3/4" = 1'-0"



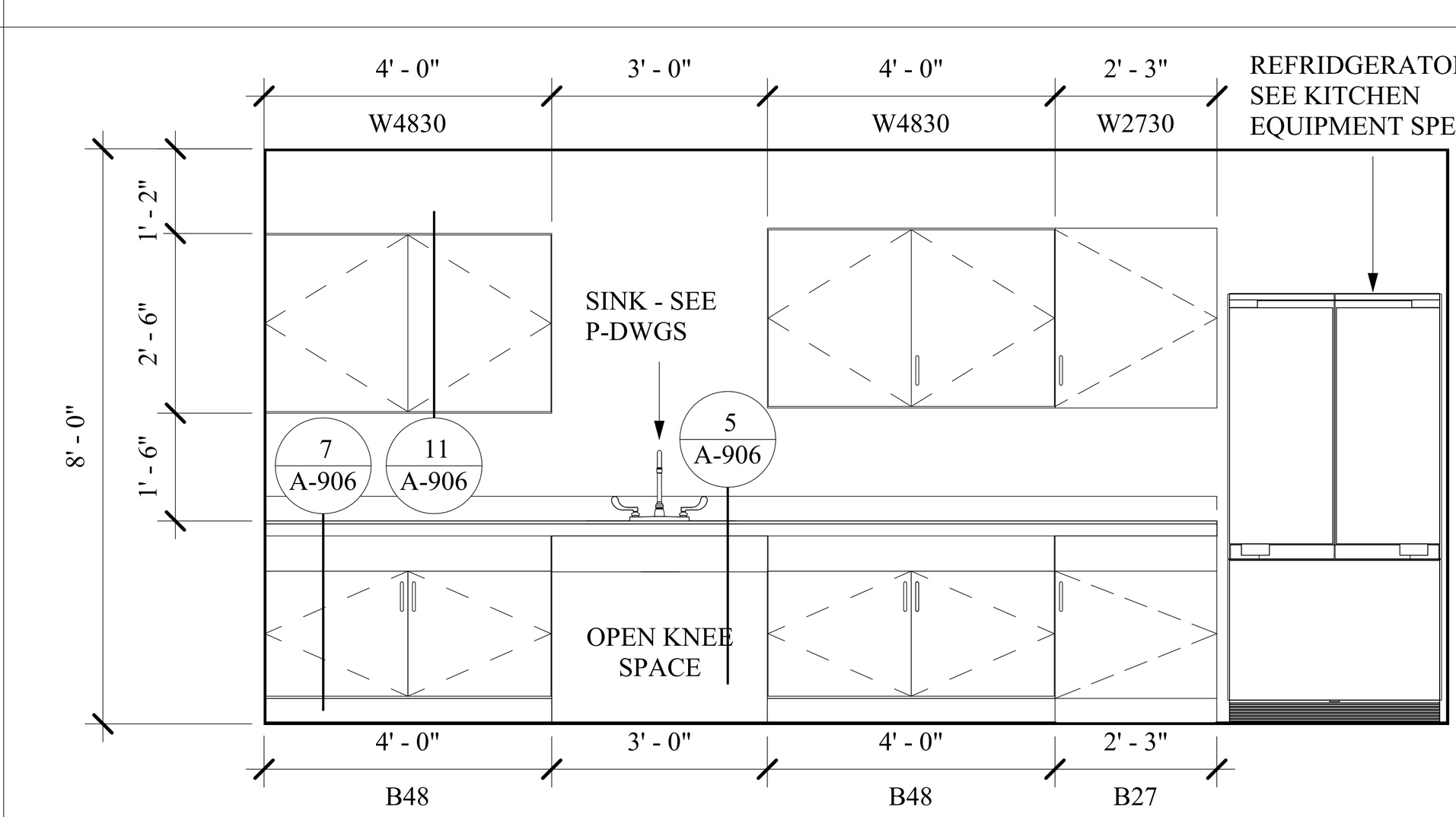
9 LAB ELEVATION
A-906 SCALE: 3/8" = 1'-0"



10 LAB ELEVATION
A-906 SCALE: 3/8" = 1'-0"



11 WALL CABINET DETAIL
A-906 SCALE: 3/4" = 1'-0"



12 BREAK ROOM ELEVATION
A-906 SCALE: 3/4" = 1'-0"

MHE ENGINEERING
33 Airport Center Drive, Suite 202
New Windsor, NY 12553
(845) 567-3100
111 Wheatfield Drive, Suite 1
Milford, PA 18337
(570) 296-2765

BID SET

CAESARS LANE WWTP EXPANSION PROJECT: PHASE 1
145 CAESARS LN.
NEW WINDSOR, NY 12553
FOR TOWN OF NEW WINDSOR
555 UNION AVE.
NEW WINDSOR, NY 12553

CONTROL BUILDING - FLOOR PLAN LAB & INTERIOR ELEVATIONS

REVISIONS

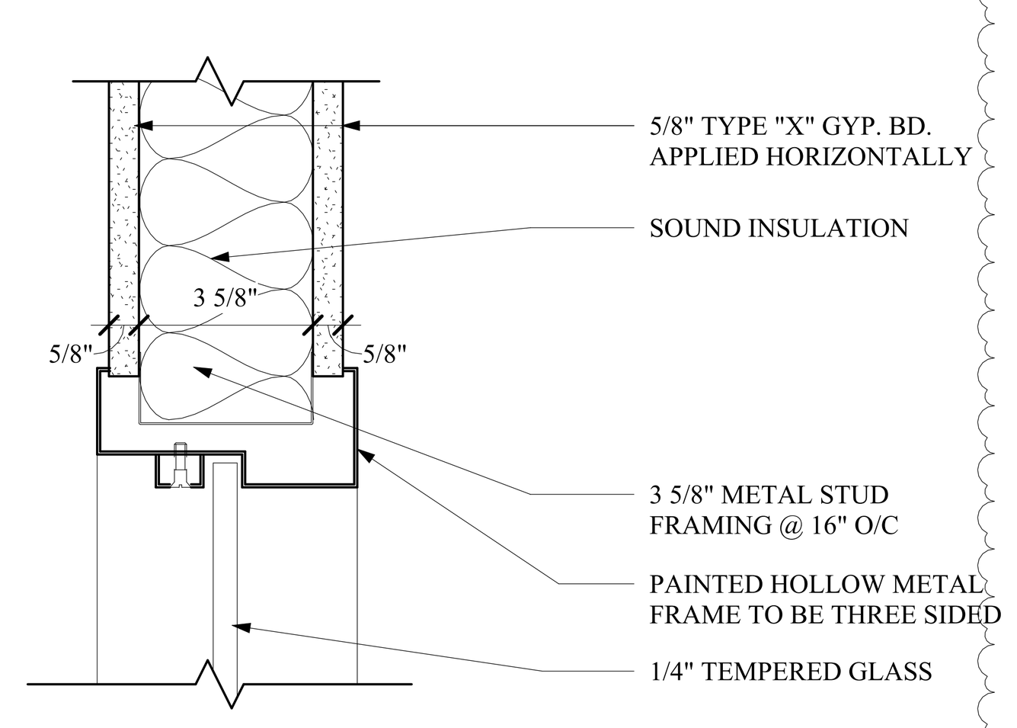
NO.	DESCRIPTION	DATE
1	REV PER ADDENDUM 2	1/16/2025

ISSUED DATE:	21 NOV, 2024
DESIGNED BY:	AW
DRAWN BY:	EDIII, CH
CHECKED BY:	AW
REVIEWED BY:	ML

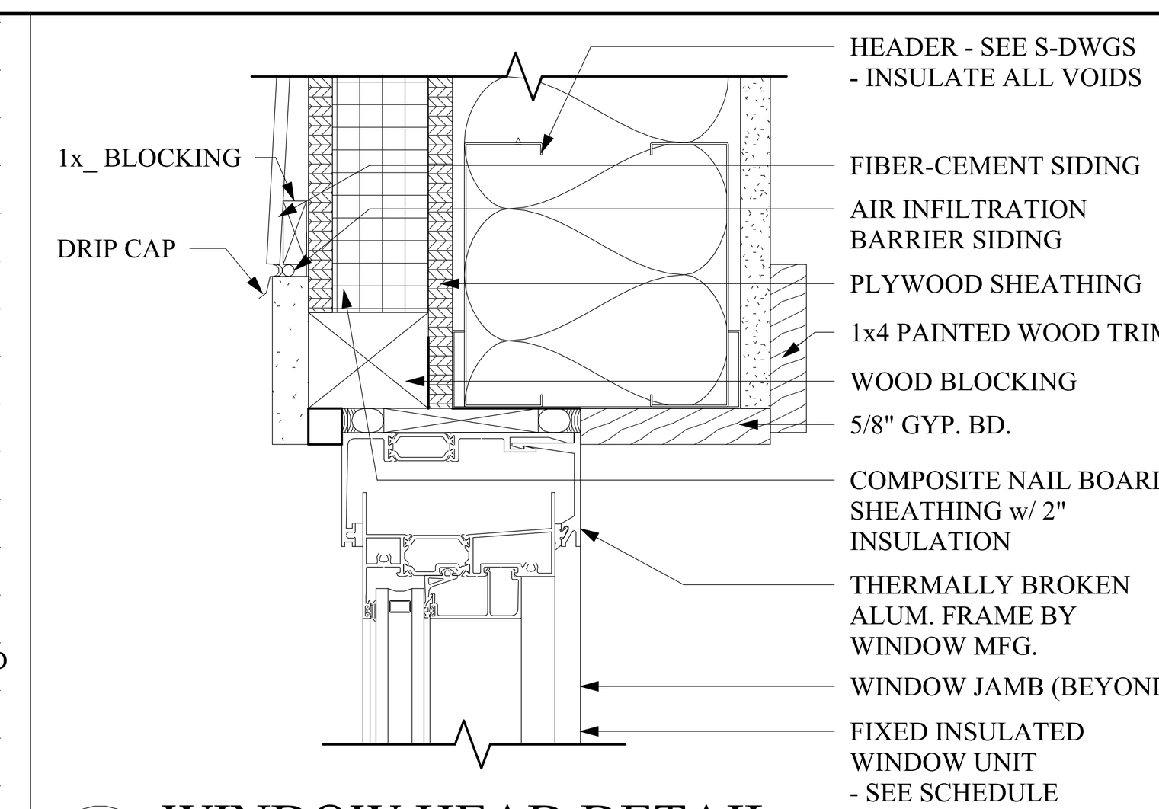
SHEET NO.

A-906

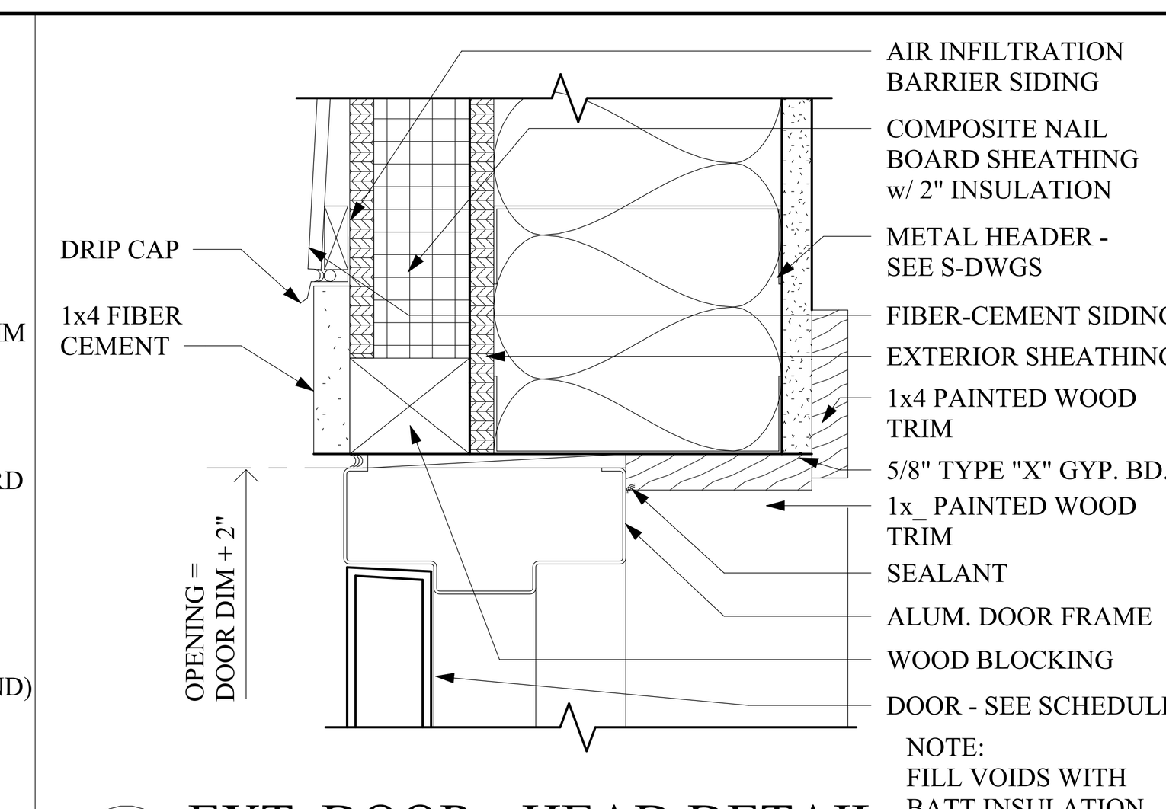
PROJECT # 18-732 PHASE #



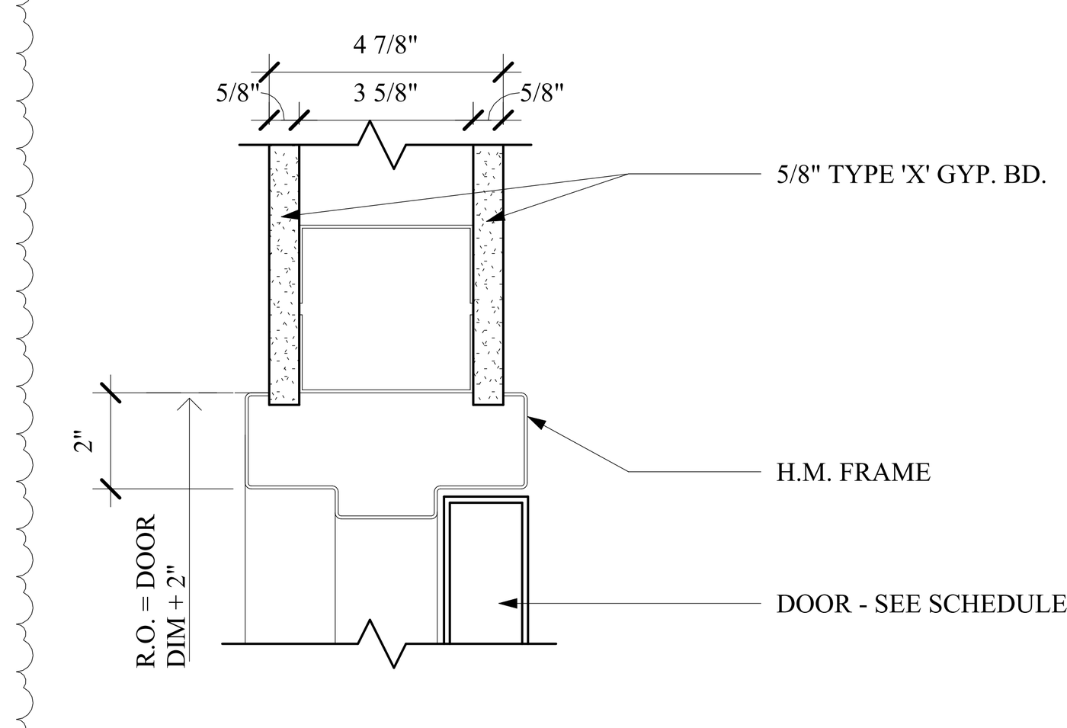
1 A-907 LOBBY WINDOW - HEAD DETAIL
SCALE: 3" = 1'-0"



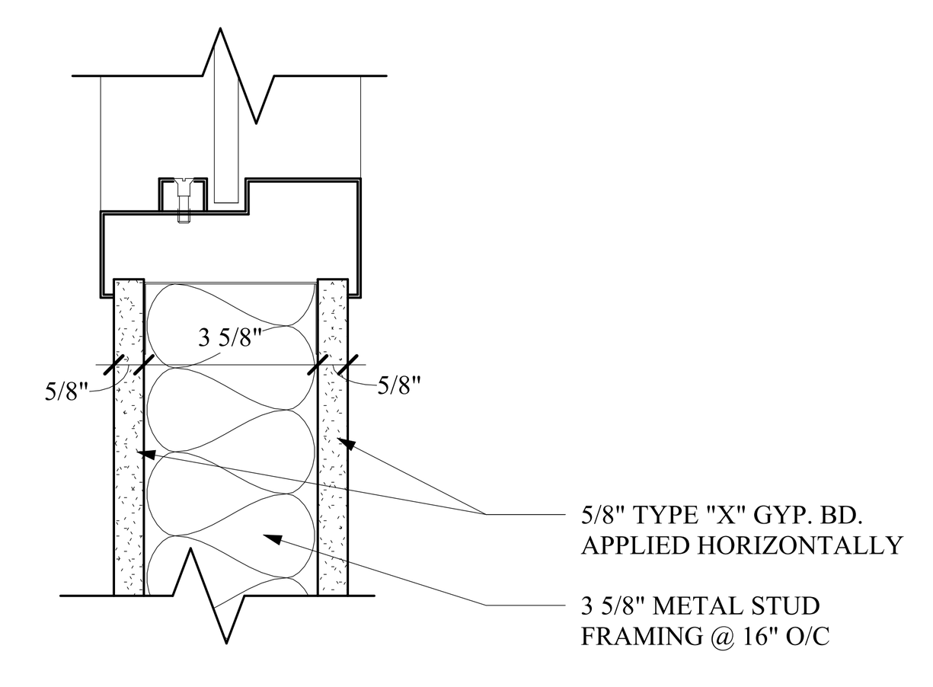
2 A-907 WINDOW HEAD DETAIL
SCALE: 3" = 1'-0"



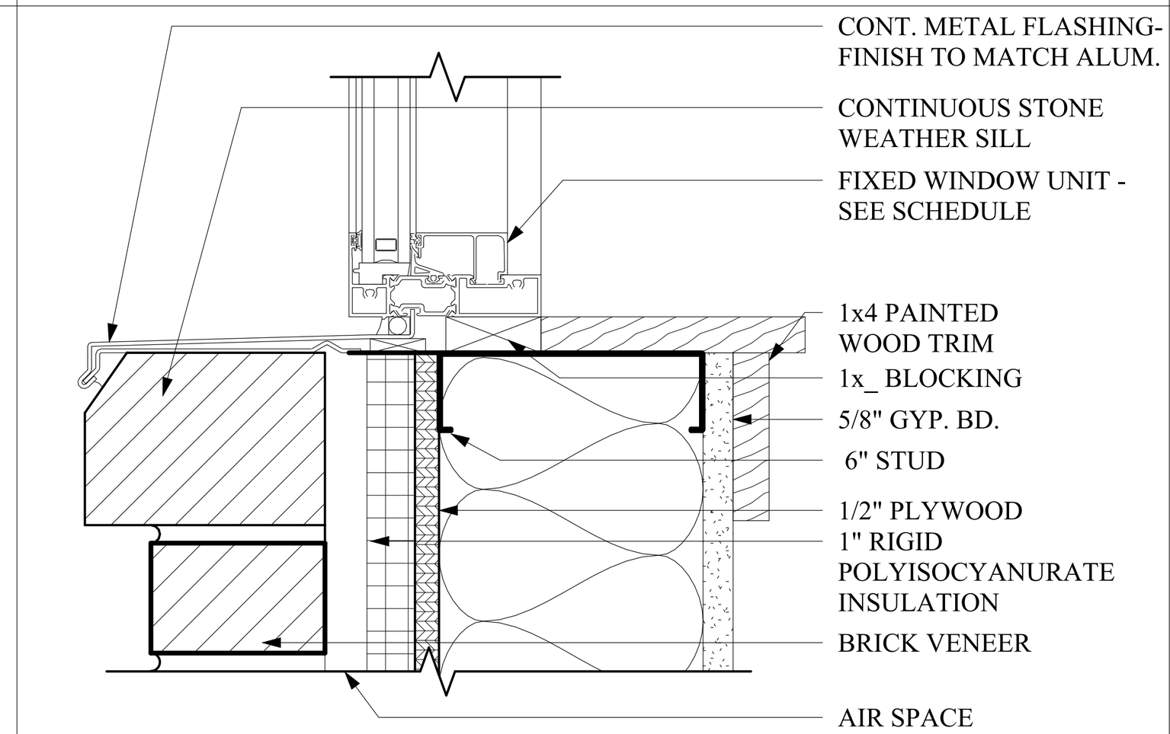
3 A-907 EXT. DOOR - HEAD DETAIL
SCALE: 3" = 1'-0"



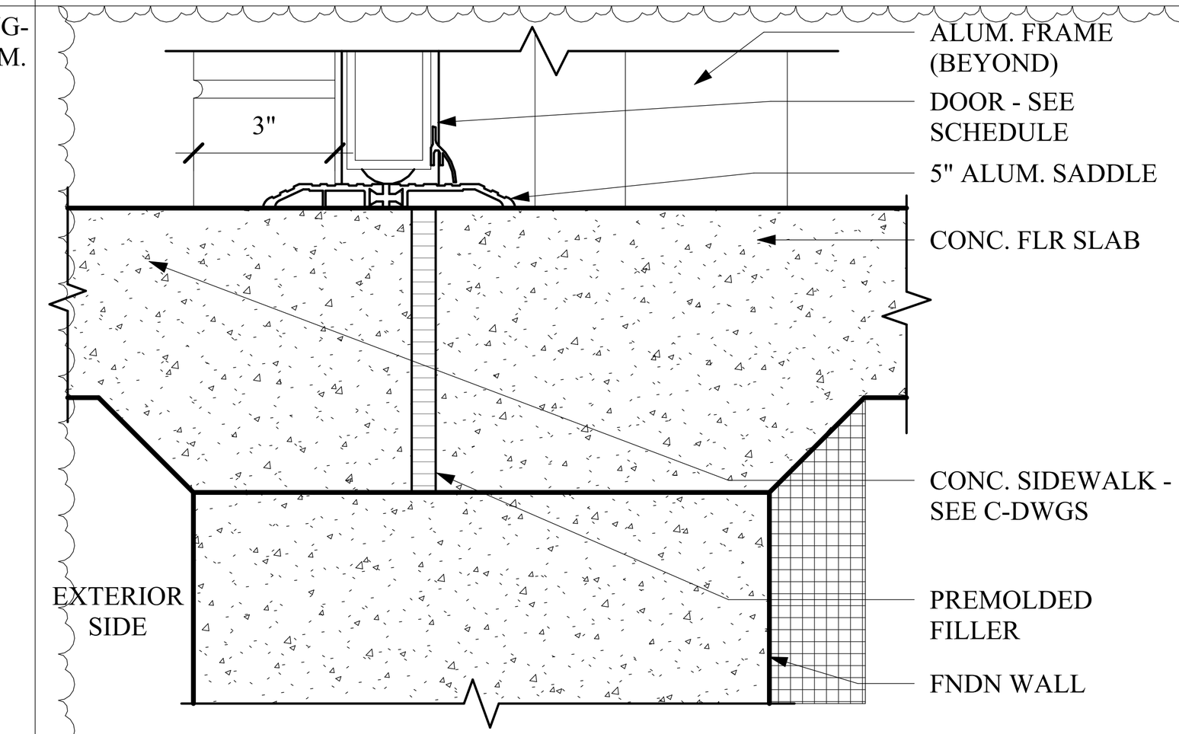
4 A-907 INT. DOOR - HEAD DETAIL
SCALE: 3" = 1'-0"



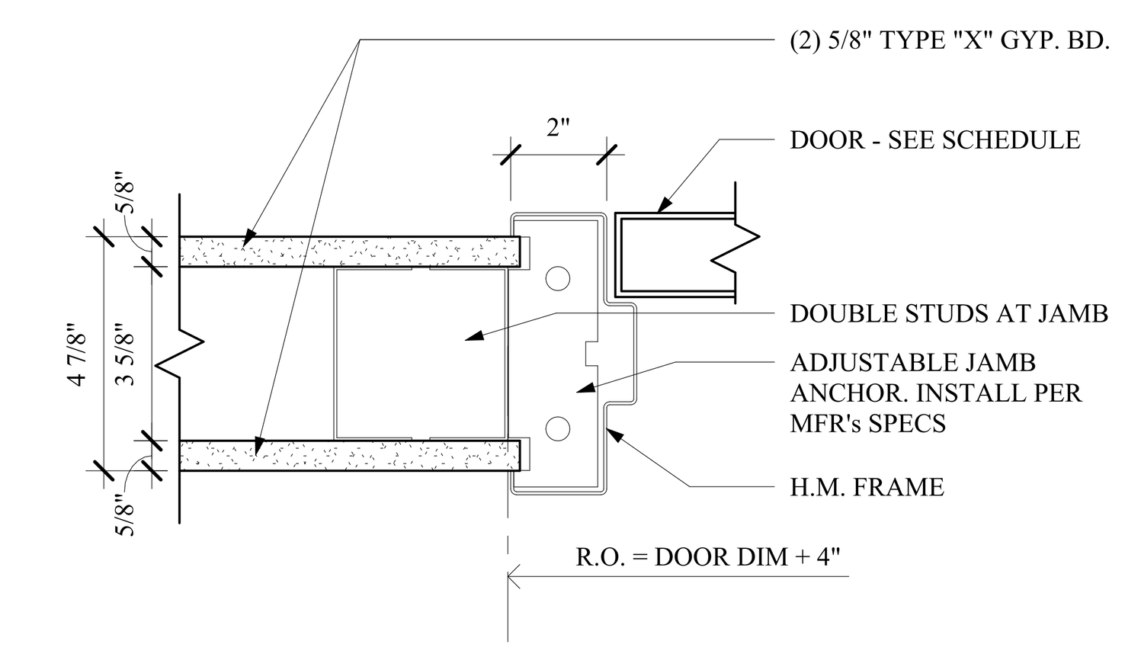
5 A-907 LOBBY WINDOW - SILL DETAIL
SCALE: 3" = 1'-0"



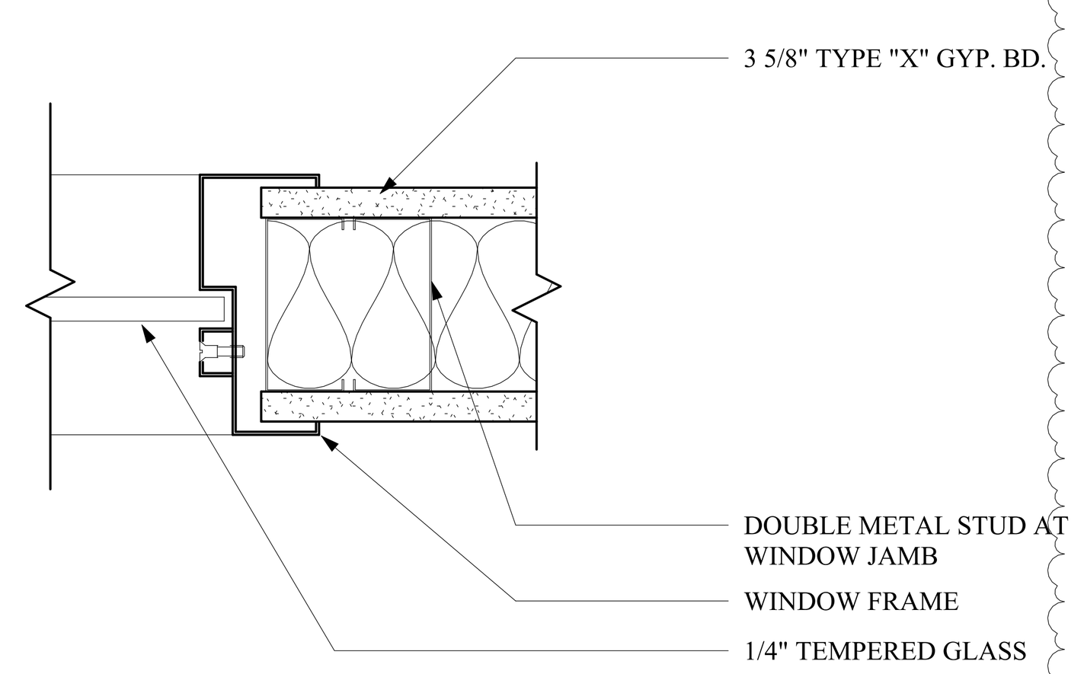
6 A-907 WINDOW SILL DETAIL
SCALE: 3" = 1'-0"



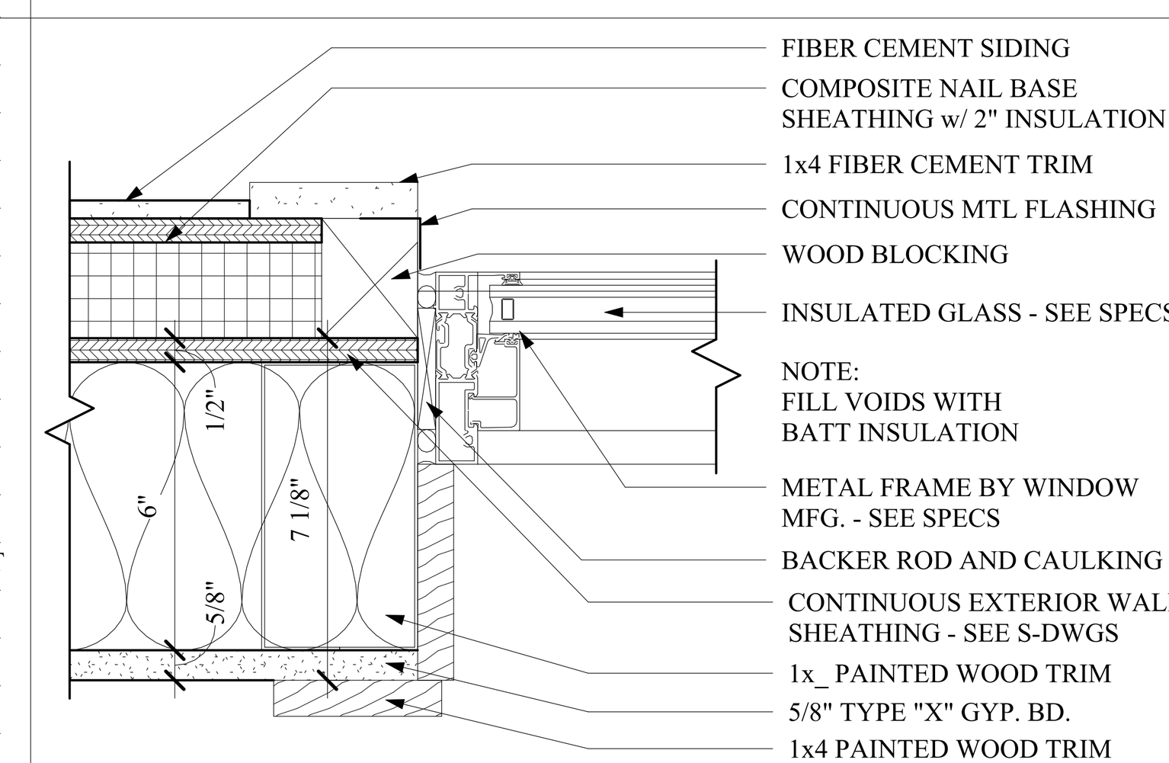
7 A-907 EXT. DOOR - SILL DETAIL
SCALE: 3" = 1'-0"



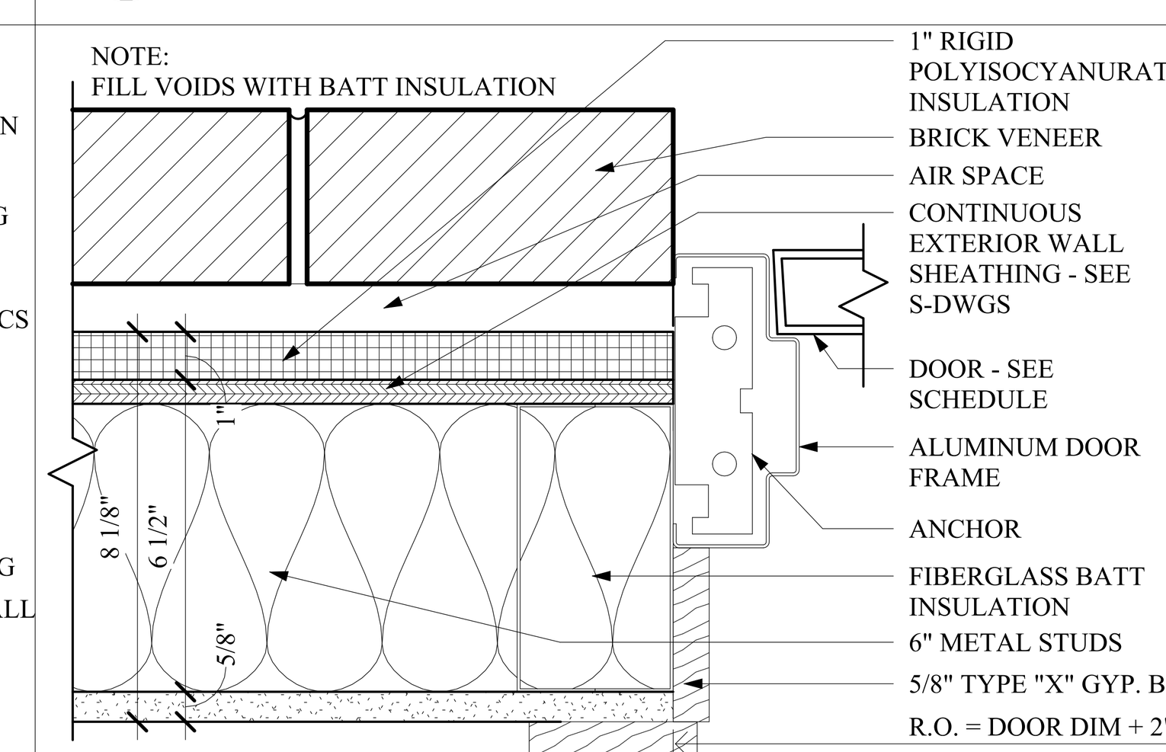
8 A-907 INT. DOOR - JAMB DETAIL
SCALE: 3" = 1'-0"



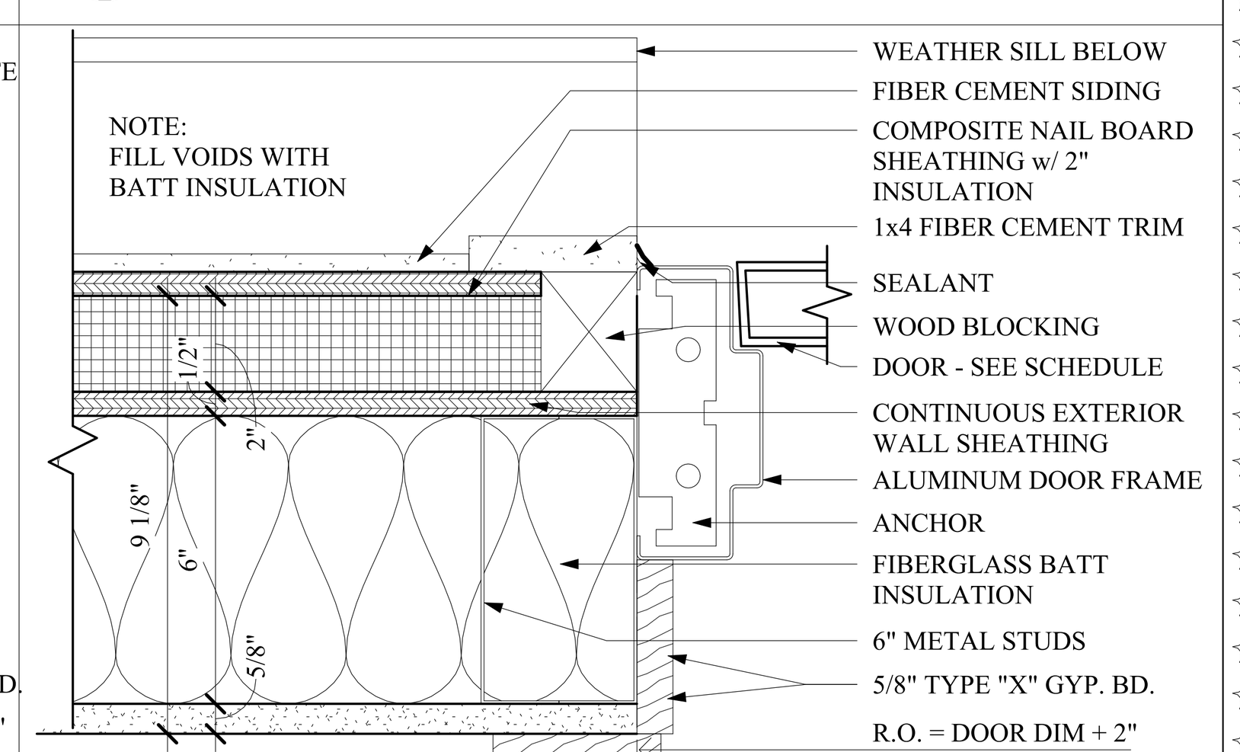
9 A-907 LOBBY WINDOW - JAMB DETAIL
SCALE: 3" = 1'-0"



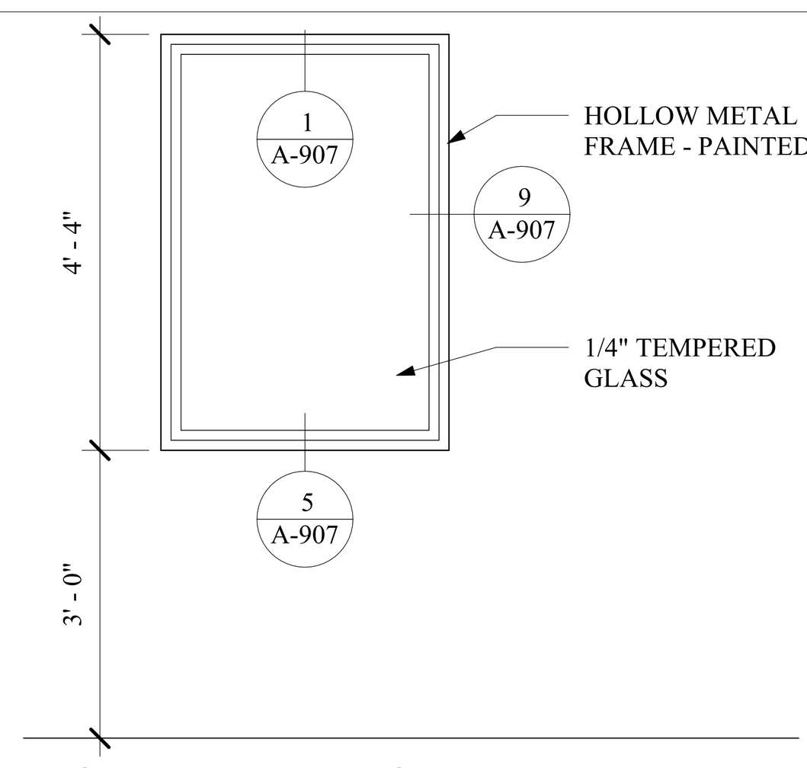
10 A-907 WINDOW JAMB DETAIL
SCALE: 3" = 1'-0"



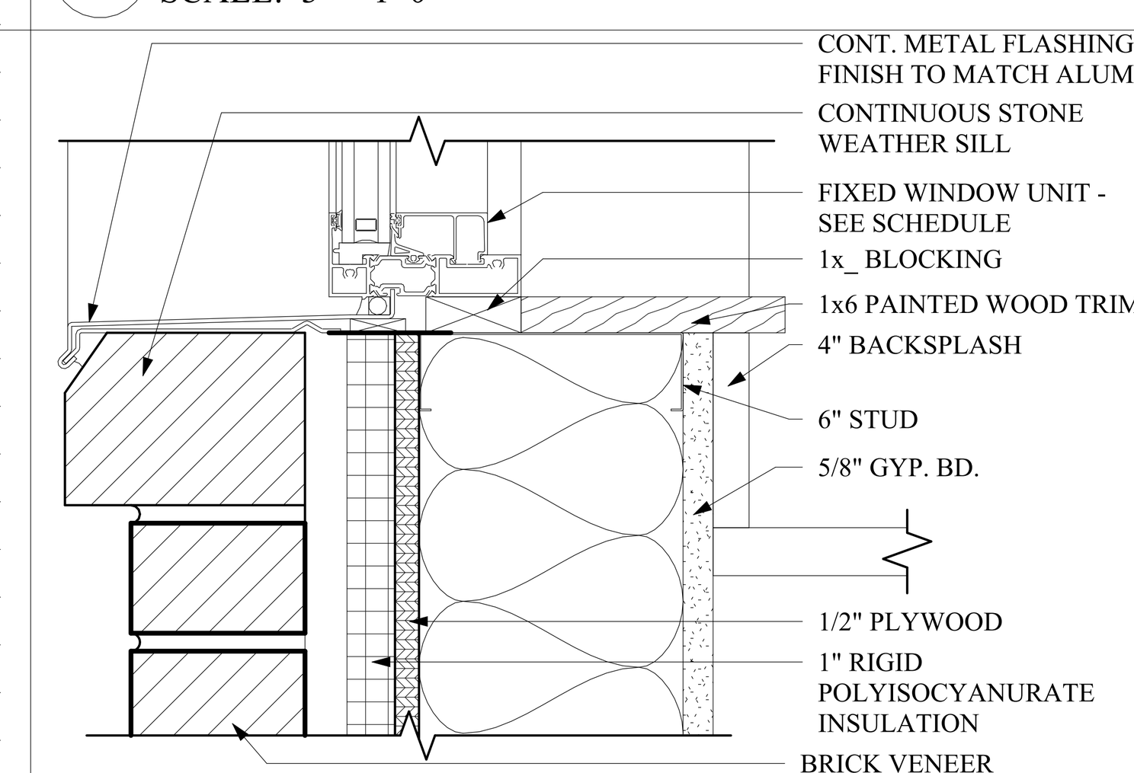
11 A-907 EXT. DOOR - LOWER JAMB DETAIL
SCALE: 3" = 1'-0"



12 A-907 EXT. DOOR - UPPER JAMB DETAIL
SCALE: 3" = 1'-0"

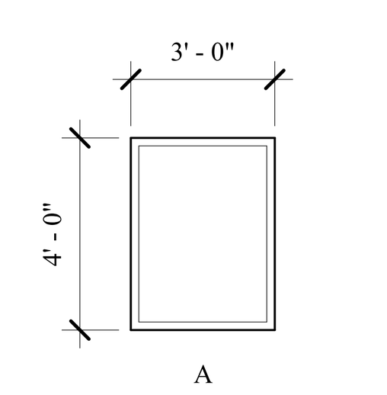


13 A-907 LOBBY WINDOW
SCALE: 1/2" = 1'-0"

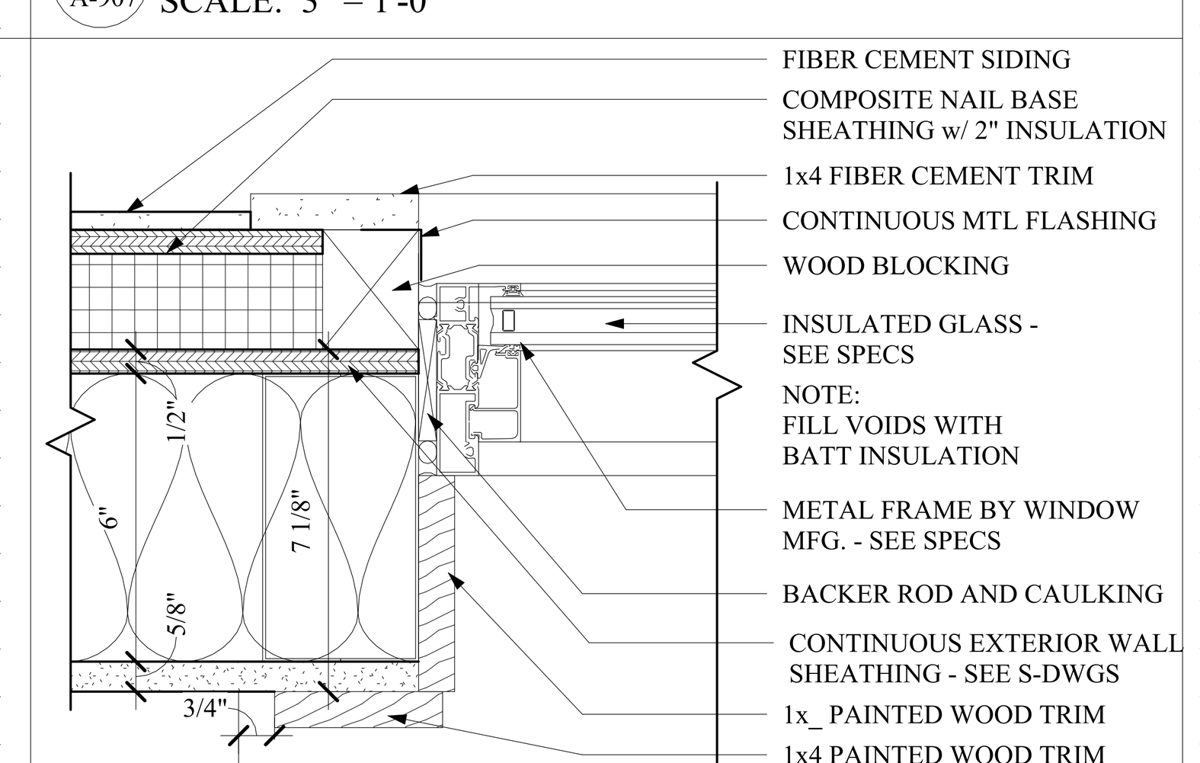


14 A-907 WINDOW SILL AT LAB DETAIL
SCALE: 3" = 1'-0"

WINDOW SCHEDULE					
TYPE	WIDTH	HEIGHT	MATERIAL	QUANTITY	NOTES
A	3' - 0"	4' - 0"	ALUMINUM	17	

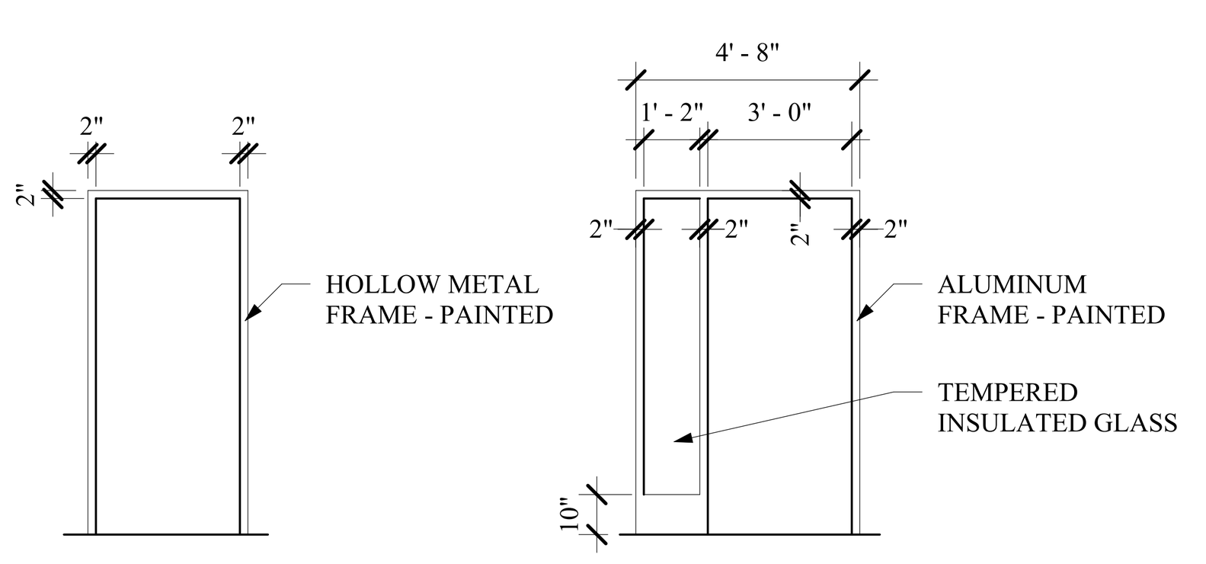


EXT. WINDOW ELEVATION

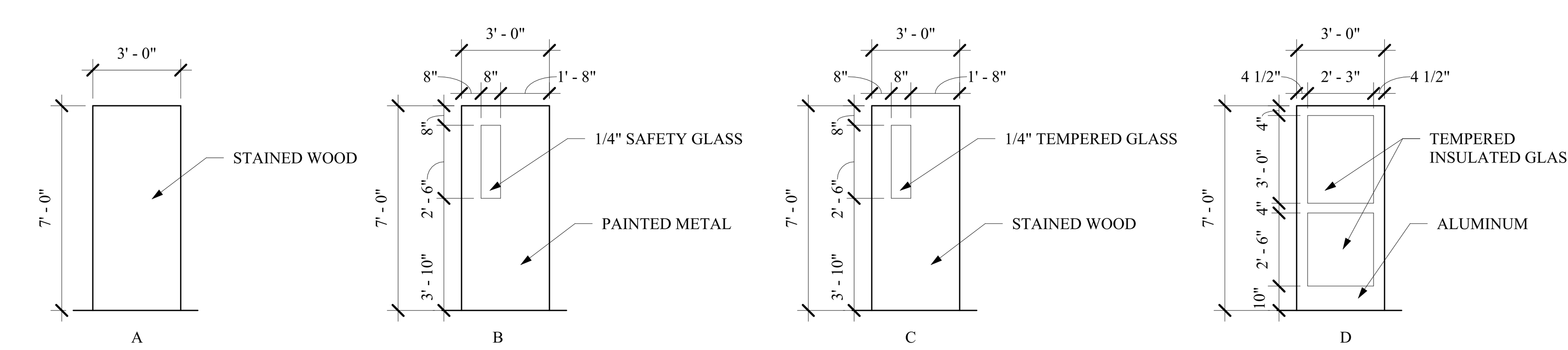


15 A-907 WINDOW JAMB AT LAB DETAIL
SCALE: 3" = 1'-0"

DOOR SCHEDULE												
DOOR No.	LOCATION	WIDTH	HEIGHT	THICKNESS	QTY	DOOR TYPE	FRAME TYPE	SADDLE	HARDWARE GROUP	FIRE RATING	DETAILS	REMARKS
901A	ROOM 901 - EXTERIOR	3' - 0"	7' - 0"	1 3/4"	1	D	2	ALUM.	8			
901B	ROOM 901 - ROOM 910	3' - 0"	7' - 0"	1 3/4"	1	C	1		1			
902A	ROOM 910 - ROOM 902	3' - 0"	7' - 0"	1 3/4"	1	C	1		9			
902B	ROOM 902 - ROOM 902	6' - 0"	3' - 0"	1 3/4"	2	A	1		4			
903A	ROOM 902 - ROOM 903	3' - 0"	7' - 0"	1 3/4"	1	A	1		9			
903B	ROOM 903 - ROOM 903	6' - 0"	3' - 0"	1 3/4"	2	A	1		4			
904	ROOM 904 - ROOM 910	3' - 0"	7' - 0"	1 3/4"	1	A	1		10			
905	ROOM 910 - ROOM 905	3' - 0"	7' - 0"	1 3/4"	1	C	1		11			
906	ROOM 910 - ROOM 906	3' - 0"	7' - 0"	1 3/4"	1	A	1		3			
907	ROOM 907 - ROOM 910	3' - 0"	7' - 0"	1 3/4"	1	A	1		3			
908	ROOM 910 - ROOM 908	3' - 0"	7' - 0"	1 3/4"	1	A	1		3			
909	ROOM 910 - ROOM 909	3' - 0"	7' - 0"	1 3/4"	1	C	1		11			
911	ROOM 911 - ROOM 912	6' - 0"	3' - 0"	1 3/4"	2	A	1		4			
912A	ROOM 913 - ROOM 912	3' - 0"	7' - 0"	1 3/4"	1	C	1		6			
912B	ROOM 910 - ROOM 912	3' - 0"	7' - 0"	1 3/4"	1	C	1		5			
913A	ROOM 913 - EXTERIOR	3' - 0"	7' - 0"	1 3/4"	1	D	2	ALUM.	7			
913B	ROOM 914 - ROOM 913	3' - 0"	7' - 0"	1 3/4"	1	C	1		2			
915	ROOM 914 - ROOM 915	3' - 0"	7' - 0"	1 3/4"	1	A	1	MARBLE	12			
916	ROOM 914 - ROOM 916	3' - 0"	7' - 0"	1 3/4"	1	A	1	MARBLE	12			



FRAME TYPES



DOOR TYPES

MHE ENGINEERING

33 Airport Center Drive, Suite 202
New Windsor, NY 12553
(845) 567-3100

111 Wheatfield Drive, Suite 1
Milford, PA 18337
(570) 296-2765

BID SET

UDIG·NY SAFE DIGGING STARTS HERE CALL 811

CAESARS LANE WWTP EXPANSION PROJECT: PHASE 1
145 CAESARS LN.
NEW WINDSOR, NY 12553
FOR TOWN OF NEW WINDSOR
555 UNION AVE.
NEW WINDSOR, NY 12553

CONTROL BUILDING - WINDOW, DOOR & MISCELLANEOUS DETAILS & SCHEDULES

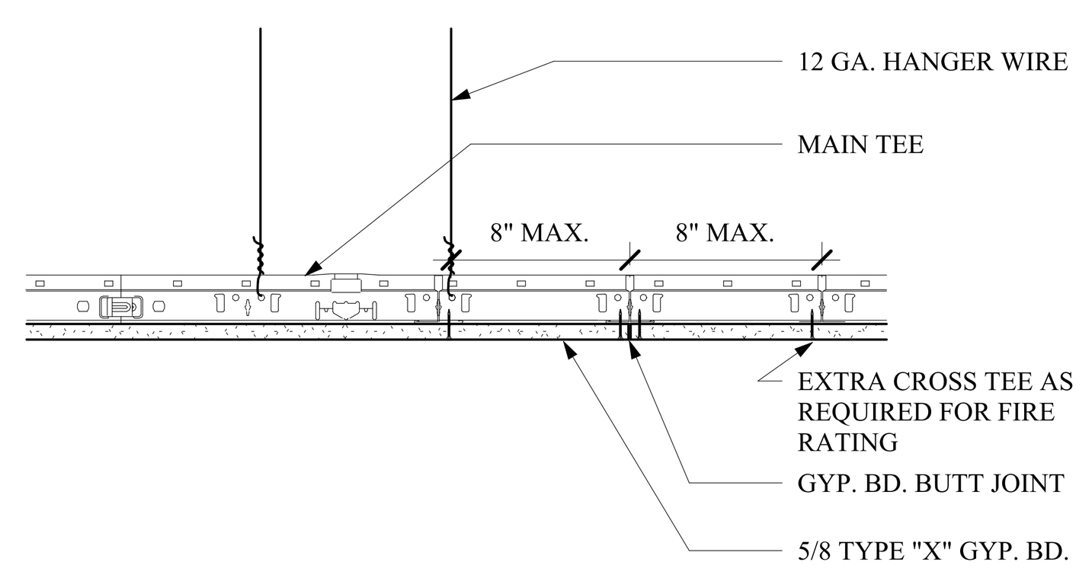
REVISIONS

NO.	DESCRIPTION	DATE
1	REV PER ADDENDUM 2	1/16/2025

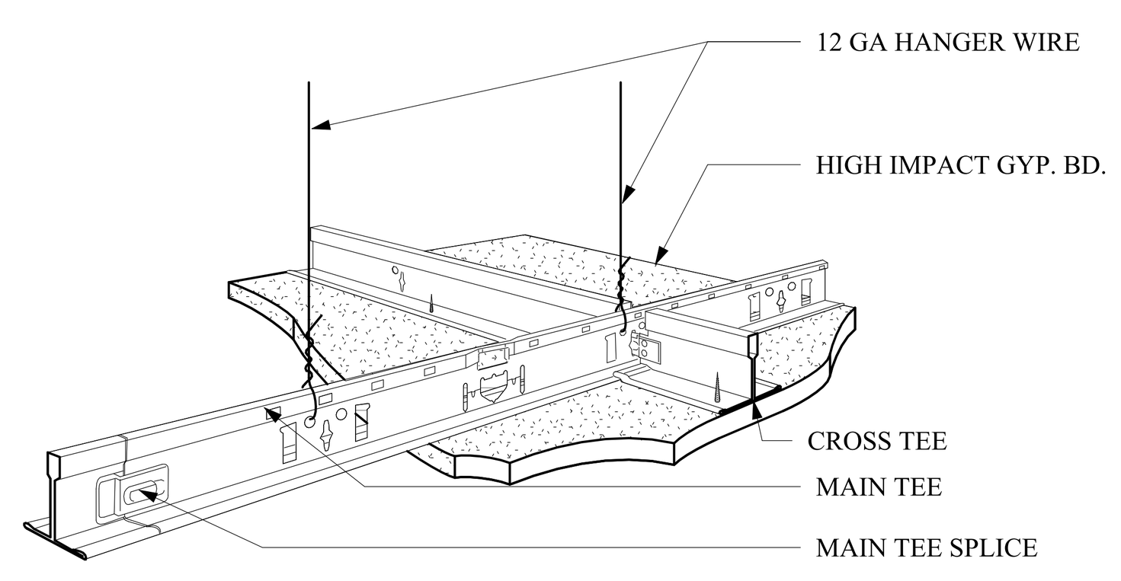
ISSUED DATE:	21 NOV, 2024
DESIGNED BY:	AW
DRAWN BY:	CH, EDIII
CHECKED BY:	AW
REVIEWED BY:	ML

SHEET NO.
A-907

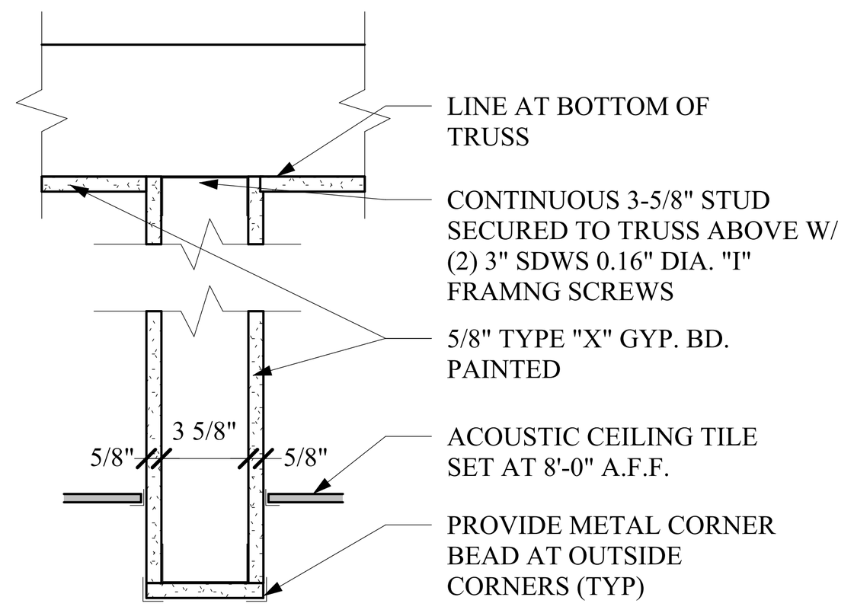
PROJECT # 18-732 PHASE #



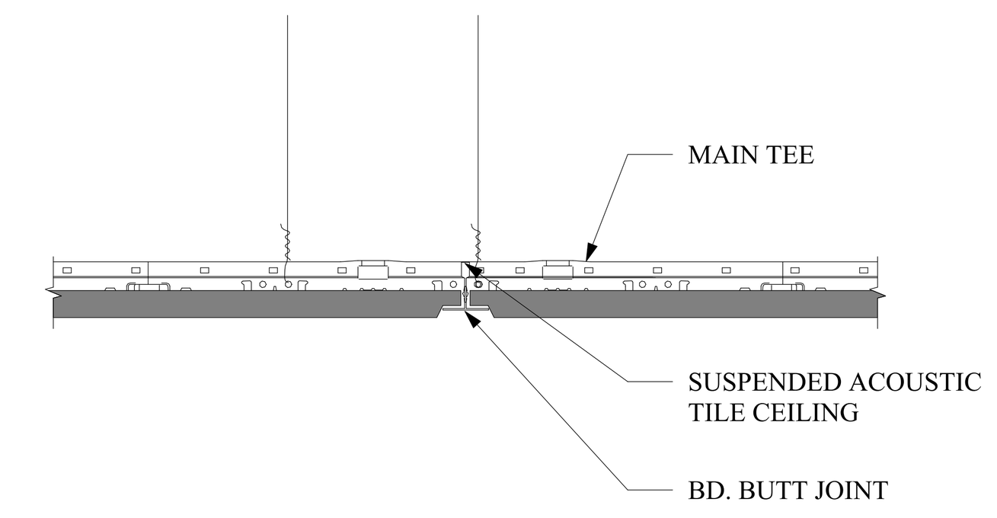
1 A-908 GYP. BD. SUSPENSION DETAIL
SCALE: 3" = 1'-0"



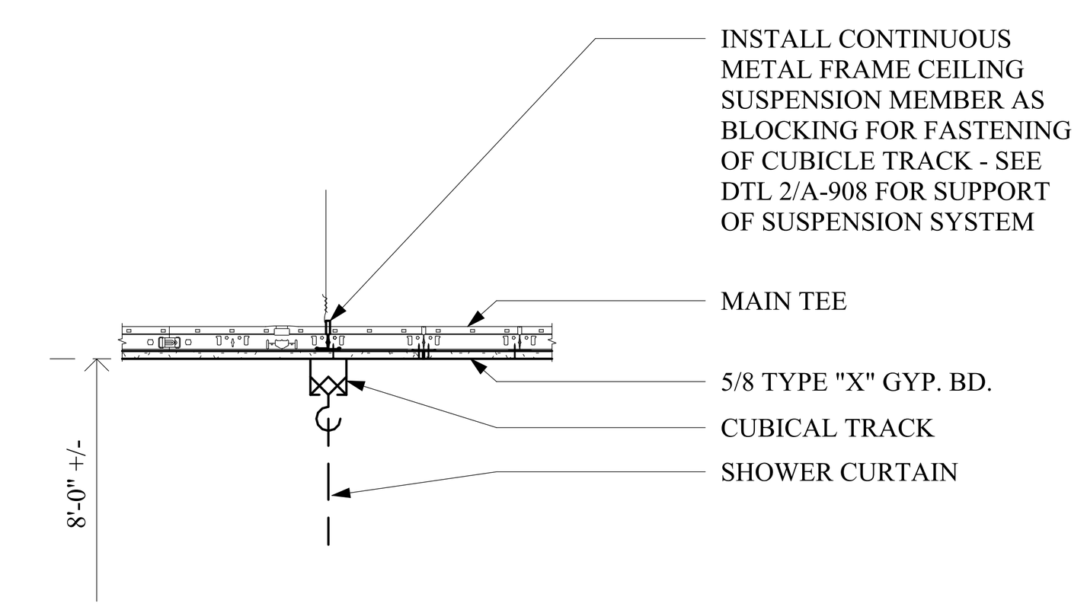
2 A-908 GYP. BD. SUSPENSION DETAIL
SCALE: 3" = 1'-0"



3 A-908 CEILING HEIGHT CHANGE DETAIL
SCALE: 1 1/2" = 1'-0"



4 A-908 ACOUSTIC CEILING TILE DTL
SCALE: 3" = 1'-0"



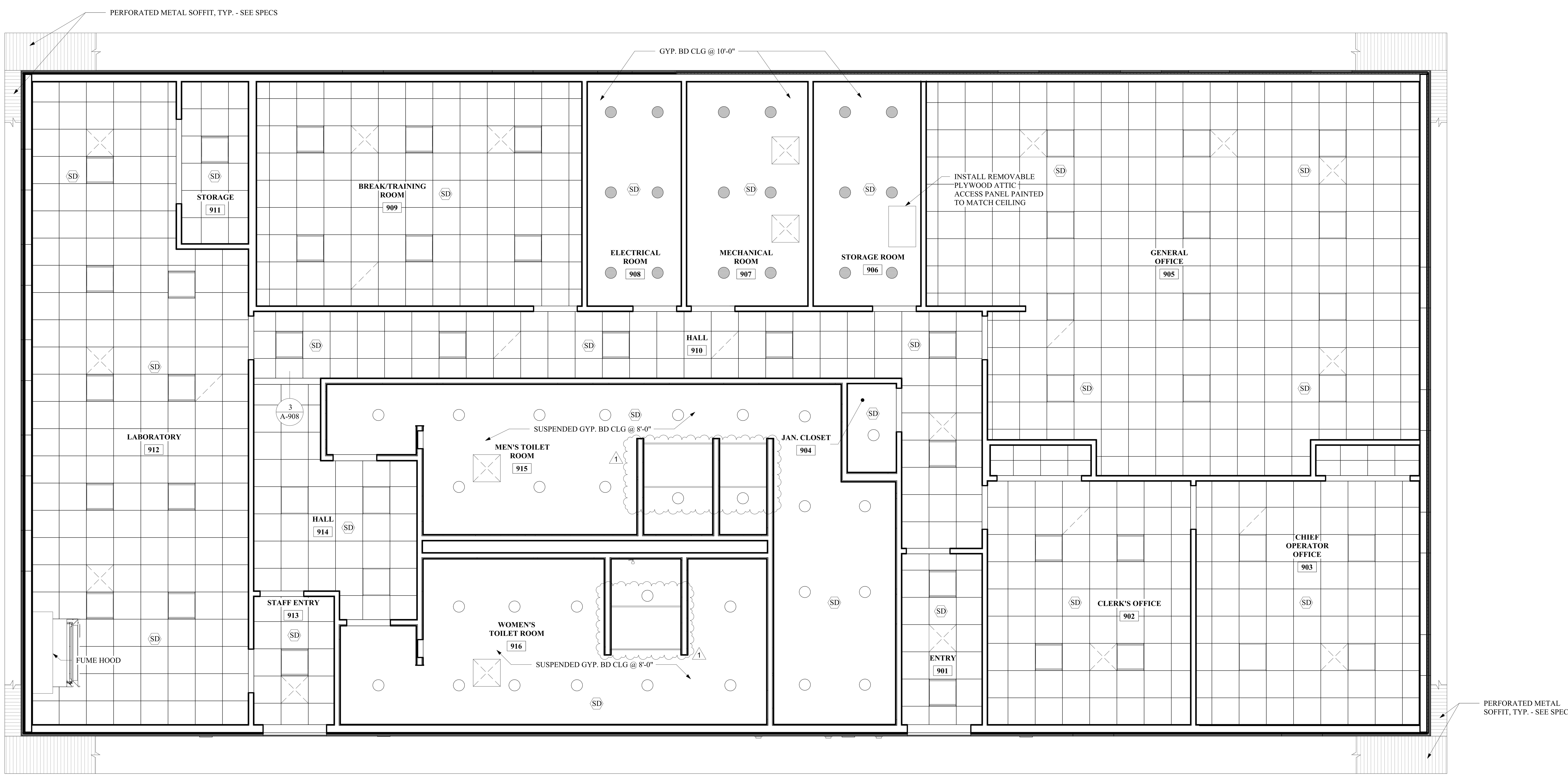
5 A-908 SHOWER CURTAIN TRACK DETAIL
SCALE: 1 1/2" = 1'-0"

1

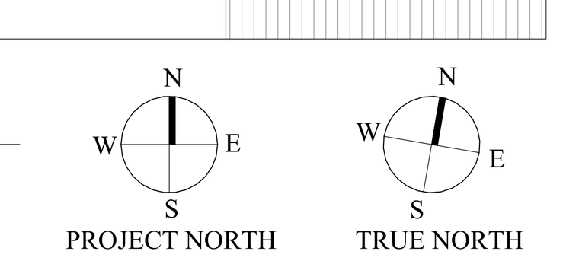
LEGEND

2' x 2' LED LIGHT -SEE ELECTRICAL DWG	CO CARBON MONOXIDE DETECTOR -SEE ELECTRICAL DWG
RECESSED CEILING LIGHT -SEE ELECTRICAL DWG	SD SMOKE DETECTOR -SEE ELECTRICAL DWG
SURFACE MOUNTED CEILING LIGHT -SEE ELECTRICAL DWG	H HEAT DETECTOR -SEE ELECTRICAL DWG
CEILING DIFFUSER -SEE MECHANICAL DWG	OS OCCUPANCY SENSOR -SEE ELECTRICAL DWG
RETURN AIR GRILL -SEE MECHANICAL DWG	

NOTES:
1. ALL CEILING HEIGHTS TO BE AT 8'-0" A.F.F. UNLESS NOTED OTHERWISE
3. INSTALL 5/8" GYP. BD. AT BOTTOM OF TRUSSES THROUGHOUT ENTIRE BUILDING



REFLECTED CEILING PLAN
SCALE: 1/4" = 1'-0"



MHE ENGINEERING
33 Airport Center Drive, Suite 202
New Windsor, NY 12553
(845) 567-3100
111 Wheatfield Drive, Suite 1
Milford, PA 18337
(570) 296-2765

BID SET

UDIG·NY SAFE DIGGING STARTS HERE CALL 811

CAESARS LANE WWTP EXPANSION PROJECT: PHASE 1

145 CAESARS LN.
NEW WINDSOR, NY 12553
FOR TOWN OF NEW WINDSOR
555 UNION AVE.
NEW WINDSOR, NY 12553

CONTROL BUILDING - REFLECTED CEILING PLAN & CEILING DETAILS

REVISIONS

NO.	DESCRIPTION	DATE
1	REV PER ADDENDUM 2	1/16/2025

ISSUED DATE:	21 NOV, 2024
DESIGNED BY:	AW
DRAWN BY:	TS, EDIII, CH
CHECKED BY:	AW
REVIEWED BY:	ML

SHEET NO.
A-908

PROJECT # 18-732 PHASE #