AUGUST 22, 2025

CONTRACT NO. 1800

WET WEATHER PUMP STATION

ADDENDUM NO. 9

All bidders bidding **Contract No. 1800** shall read and take note of this **Addendum No. 9.** The Procurement Documents for **Contract No. 1800 WET WEATHER PUMP STATION** are hereby revised and/or clarified as stated below.

Acknowledgement of Contract No. 1800 Addendum No. 9

The Acknowledgement attached to **Addendum No. 9** is to be signed and returned immediately via email at contract.clerks@alcosan.org and acknowledged with Bidder's Proposal.

~~**Kimberly Kennedy, P.E.**~~

~~Director – Engineering and Construction~~

Jefferson Argyros, P.E. (on behalf of Kimberly Kennedy)
Manager of Capital Projects – Treatment

3300 Preble Avenue • Pittsburgh, PA 15233-1092 • ph: 412.766.4810
www.alcosan.org

ACKNOWLEDGEMENT OF

CONTRACT NO. 1800 G, E, H, P – WET WEATHER PUMP STATION

ADDENDUM NUMBER 9

FIRM NAME: _____

SIGNATURE: _____

TITLE: _____

DATE: _____

August 22, 2025

CONTRACT NO. 1800

WET WEATHER PUMP STATION

ADDENDUM NO. 9

ADDENDUM NO. 9

ALLEGHENY COUNTY SANITARY

AUTHORITY

PITTSBURGH, PENNSYLVANIA

CONTRACT NO. 1800

WET WEATHER PUMP STATION PROJECT

August 22, 2025

ATTENTION

NEW BID OPENING DATE

THURSDAY, OCTOBER 2, 2025

11:00 A.M.

NEW DEADLINE FOR QUESTIONS IS THURSDAY, SEPTEMBER 4, 2025

This Addendum No. 9 consists of 16 pages and the following attachments:

Attachment A – Addendum No. 9 Specifications (96 pages)
Attachment B – Addendum No. 9 Drawings – 22” x 34” (20 pages)

ATTENTION BIDDERS

The following additions to and modifications of the Contract Documents will be included in and become part of the Contract for the Allegheny County Sanitary Authority (ALCOSAN) Wet Weather Pump Station Project. Bidders are instructed to take the following into account in rendering any Bid for this work

The Bidder is responsible for verifying that he/she has received and reviewed all of the pages of the Contract Documents as well as all of the pages and attachments of all addenda. The Bidder shall verify all pages with the table of contents in the Contract Documents and the first page of all Addenda. Receipt of this Addendum No. 9 must be noted on the Bid Form. These items modify the portions of the documents specifically noted; all other provisions of the Contract Documents shall remain in effect

1. CHANGES TO PRIOR ADDENDUM

1.1 In Addendum No. 5 **CHANGE** Item 1.2 as it relates to Volume 1of 5, Article 1 Bidding Documents to read as follows:

REVISE second paragraph on page 1-17G to state,

"The Bidder further certifies that they understand that they are required to submit, within 5 days of Owner's request, a specific proposal indicating the manner in which it will attempt to comply with this requirement. This proposal shall include the four pages following page 1-17G in Article 1 (Bidding Documents)."

REVISE second paragraph on page 1-14E to state,

"The Bidder further certifies that they understand that they are required to submit, within 5 days of Owner's request, a specific proposal indicating the manner in which it will attempt to comply with this requirement. This proposal shall include the four pages following page 1-14E in Article 1 (Bidding Documents)."

REVISE second paragraph on page 1-14H to state,

"The Bidder further certifies that they understand that they are required to submit, within 5 days of Owner's request, a specific proposal indicating the manner in which it will attempt to comply with this requirement. This proposal shall include the four pages following page 1-14H in Article 1 (Bidding Documents)."

REVISE second paragraph on page 1-14P to state,

"The Bidder further certifies that they understand that they are required to submit, within 5 days of Owner's request, a specific proposal indicating the manner in which it will attempt to comply with this requirement. This proposal shall include the four pages following page 1-14P in Article 1 (Bidding Documents)."

1.2 In Addendum No. 6 Item 1.1 as it relates to Volume 1of 5, Article 1 Bidding Documents, Legal Notice,

In the first paragraph **CHANGE** the words "Wednesday, September 17, 2025" to read "Thursday, October 2, 2025".

1.3 In Addendum No. 6 Item 1.2 as it relates to Volume 1of 5, Article 2.06 SUBMISSION OF BIDS,

In the second paragraph **CHANGE** the words Wednesday, September 17, 2025" to read "Thursday, October 2, 2025".

1.4 In Addendum No. 6 Item 1.3 as it relates to Volume 1of 5, Article 2.13 QUESTIONS REGARDING CONTRACT DOCUMENTS/ERRORS,

REVISE the second paragraph, first sentence to read as follows:

"To receive consideration, any question, inquiry or request for interpretation or clarification shall be submitted to the Owner in writing, by 4:00 PM local time, Thursday, September 4, 2025."

2. CHANGES TO THE SPECIFICATIONS

2.1 In Volume 2 of 5, Specification Section 01 50 00 Construction Facilities and Temporary Controls, **REPLACE** this Section in its entirety.

2.2 In Volume 2 of 5, Specification Section 01 71 16 Manufacturer Acceptance of Conditions, **REPLACE** this Section in its entirety.

2.3 In Volume 2 of 5, Specification Section 01 75 00 Facility Startup Manufacturer Acceptance of Conditions, **REPLACE** this Section in its entirety.

2.4 In Volume 2 of 5, Specification Section 07 10 00 Dampproofing and Waterproofing,

ADD "(Below Grade)" to the end of Paragraph 2.02.B

ADD "(Below Grade)" to the end of Paragraph 3.03.

2.5 In Volume 2 of 5, Specification Section 07 51 00 Built-Up Bituminous Roof, **REPLACE** this Section in its entirety.

2.6 In Volume 2 of 5, Specification Section 08 91 19 Fixed Louvers, **REPLACE** this Section in its entirety.

2.7 In Volume 2 of 5, Specification Section 10 14 00 Signage, Part 3.03 B Information Signage,

In the second column of the Table, **REPLACE** the text "Building Name" with the text "Wet Weather Pump Station" and **REPLACE** the text "Building

Number" with the text "410".

In the Table Notes, **REPLACE** Note 1 with the following text:

" 1. Location, text and style shall be as approved by OWNER. Each character shall be to be clearly visible from 50 feet. Locate building signs 15-feet above grade."

2.8 In Volume 3 of 5, Specification Section 40 05 02.43 Pressurized Wastewater and Drainage, **REPLACE** this Section in its entirety.

2.9 In Volume 3 of 5, Specification Section 40 05 19 Ductile Iron Piping, **REPLACE** this Section in its entirety.

2.10 In Volume 2 of 5. Specification Section 07 10 50 Shaft Membrane Waterproofing System

REPLACE 2.01 B.1.a with "SikaPlan WP 1130 or WP1100-HL2 by SIKA Corporation"

2.11 In Volume 3 of 5, Specification Section 40 05 02.04 Non-Potable Water, **REPLACE** this Section in its entirety.

3. CHANGES TO THE DRAWINGS

3.1 **REPLACE** Sheet 430-M-20 with Sheet 430-M-20 Rev. 01, refer to Attachment B.

3.2 **REPLACE** Sheet 430-S-12 with Sheet 430-S-12 Rev. 01, refer to Attachment B.

3.3 **REPLACE** Sheet 430-S-52 with Sheet 430-S-52 Rev. 01, refer to Attachment B.

3.4 **REPLACE** Sheet 430-A-12 with Sheet 430-A-12 Rev. 01, refer to Attachment B.

3.5 **REPLACE** Sheet 430-A-13 with Sheet 430-A-13 Rev. 01, refer to Attachment B.

3.6 **REPLACE** Sheet 430-A-14 with Sheet 430-A-14 Rev. 01, refer to Attachment B.

3.7 **REPLACE** Sheet 430-A-28 with Sheet 430-A-28 Rev. 02, refer to Attachment B.

3.8 **REPLACE** Sheet 430-A-29 with Sheet 430-A-29 Rev. 01, refer to Attachment B.

3.9 **REPLACE** Sheet 430-A-30 with Sheet 430-A-39 Rev. 01, refer to Attachment B.

3.10 **REPLACE** Sheet 430-A-31 with Sheet 430-A-31 Rev. 01, refer to Attachment B.

3.11 **REPLACE** Sheet 430-A-32 with Sheet 430-A-32 Rev. 01, refer to Attachment B.

3.12 **REPLACE** Sheet 430-A-33 with Sheet 430-A-33 Rev. 01, refer to Attachment B.

3.13 **REPLACE** Sheet 430-A-34 with Sheet 430-A-34 Rev. 01, refer to Attachment B.

3.14 **REPLACE** Sheet 430-A-36 with Sheet 430-A-36 Rev. 01, refer to Attachment B.

3.15 **REPLACE** Sheet 430-AD-01 with Sheet 430-AD-01 Rev. 01, refer to Attachment B.

3.16 **REPLACE** Sheet 430-AD-02 with Sheet 430-AD-02 Rev. 01, refer to Attachment B.

3.17 **REPLACE** Sheet 430-AD-03 with Sheet 430-AD-03 Rev. 01, refer to Attachment B.

3.18 **REPLACE** Sheet 430-AD-04 with Sheet 430-AD-04 Rev. 01, refer to Attachment B.

3.19 **REPLACE** Sheet 430-AD-06 with Sheet 430-AD-06 Rev. 01, refer to Attachment B.

3.20 **REPLACE** Sheet 430-AD-10 with Sheet 430-AD-10 Rev. 01, refer to Attachment B.

4. CHANGES TO VOLUME 1 OF 5

4.1 In Article 3SC, on page "Exhibit A-3SC-5", **ADD** 2.a under the first paragraph to say:

"a. Insurance coverage for flood and flooding from ground water inflows and surface water inflows shall be sub-limited to $5,000,000."

5. QUESTIONS AND ANSWERS

Q1: Reference drawing 430-A-28 wall sections 1, detail 1: This detail calls for “continuous air and vapor membrane”. There is no spec section for air and vapor barriers or membranes. Is the continuous air and vapor membrane

reference meant to be dampproofing as specified ? If not, please provide the spec section for an air and vapor membrane or barrier.

A1: Refer to Items 2.4 and 2.5 and 3.7 of Addendum No. 9.

Q2: Reference interior and exterior stairs and railings throughout the project : It is noted that this work is delegated design that is the responsibility of the Contractor. This is reasonable for the Pump Station building interior and exterior. However, there is a concern with the type of stairs to be designed and installed in the two shaft stair towers. They are noted as steel pan stairs. This type of stair is problematic in the shaft location for two reasons. Constructability: placing concrete fill in pans 200-feet down. Durability: continuous painting maintenance of steel. We suggest five other options: stainless-steel system with grating as treads, galvanized-steel system with grating as treads, fiberglass system with grating as treads, painted-steel system with painted checker-plate treads (similar to the existing wet well), or a precast system with stainless-steel connections. Please provide direction for an appropriate baseline delegated design for these two stair towers inside the shaft.

A2: Contractor to bid metal pan stairs. Alternatives will be considered after bid. Refer to Items 3.4 to 3.20 in Addendum No. 9 to clarify stair materials.

Q3: After speaking with several of the ductile iron piping suppliers and manufacturers it has been brought to our attention that the fusion bonded epoxy coating specified in 40 05 02.23 and 40 05 19 is not available as a coating option on buried or fabricated ductile iron piping. We were also made aware that the coating is available on the fittings, but the standard coating thickness would be 6-8 mils, per AWWA C116 as referenced in the specs.

All of the manufacturers recommended a liquid applied epoxy system that would meet the service requirements.

1. Is the 6-8 mil thickness acceptable for the FBE coating on the ductile iron fittings?

2. Is a liquid applied epoxy coating for the interior and exterior of the ductile iron piping acceptable?

A3: Refer to Items 2.8, 2.9 and 2.11 of Addendum No. 9 for revisions to coatings.

Q4: Regarding ALCOSAN Wet Weather Pump Station, Distributed Antenna System, Spec 40 66 10. We are trying (unsuccessfully) to find someone to provide this antenna system and required services. We have initial contacts in to CommScope AND Corning Mobile Access. Do you know of a particular local company or Point of Contact that can provide this equipment and services and is possibly already familiar with this project? Maybe the Basis of Design company?

A4: Suggest contacting these vendors within the Pittsburgh service area.

Berk-tel: 866-206-5967

Seamless Cellular: 866-721-9357

CTS: 800-834-5838

Q5: Reference specification section 43 23 16 paragraphs 2.01.A & 2.03.H. We are having difficulties finding an Intermediate shaft manufacturer. Johnson Power is not bidding due to specified coupling type and KTR has not responded with a solution. Would an alternate shaft-coupling combination other than what is specified be acceptable ?

A5: Alternative shaft-coupling systems may be proposed, subject to review and approval by the Engineer. Pumping unit manufacturer shall provide sufficient evidence that the proposed system performance will be equivalent to the specified shaft-coupling system and ensure that it is not already disallowed in the specifications (e.g. needle bearing U-joints).

Q6: Reference detail S33002 on drawing 430-SD-02 and keynote 3 on drawing 430-M-20 : Please specify the dimensions of the weir.

A6: Refer to Item 3.1 in Addendum No. 9.

Q7: The GBR states the Contractor is to expect steady state groundwater infiltration of 1500 GPM in the shaft after grouting operations. Section 01 45 25, Paragraph 3.02 WATERTIGHTNESS TESTING, A., 1. lists the Maximum Water Leakage at various locations. In four of the five cases, "No Measurable Loss" is required with the fifth one being "0.05 percent per day". These are unreasonable requirements to meet in a shaft that is anticipated to produce 1500 GPM of water infiltration after grouting. Please revise the water leakage requirements to something more reasonable considering 1500 GPM of infiltration after grouting listed in the GBR.

A7: The watertightness testing criteria specified in Section 01 45 25 applies to completed permanent structures and the requirements shall remain. Referencing the infiltration criteria in the GBR, which is a baseline

to be used for shaft construction, is inaccurate.

Q8: Sheet 132 of 405 shows a 10'-0" spacing between the Primary 1 and 3 grout holes. Ten feet is a wide spacing considering the anticipated 1500 GPM infiltration after grouting listed in the GBR. Is the intent of the verification/secondary holes to be used to reduce this spacing if the Primary 3 grouting does not achieve the desired results?

A8: Yes, verification holes will be used to verify the performance of the primary 1, 2, and 3 grouting and be used as secondary grouting holes if desired results are not achieved.

Q9: Is the intent to drill and grout the secondary holes from the surface to reduce the infiltration of water into the shaft? Will the established bid items 04, 05, 07 and 24 be used to compensate the Contractor for the secondary grouting?

A9: Yes, verification holes will be used to verify the performance of the primary 1, 2, and 3 grouting and be used as secondary grouting holes if desired results are not achieved. Bid items 04, 05, 07, and 24 will be used to compensate the contractor for secondary grouting.

Q10: Specification Section 03 30 00 - Cast-In-Place Concrete states that the Temperature Thermal Control Plan must limit the concrete peak temperature differential to 35 degrees Fahrenheit or less. Please consider a performance based specification given the thermal control plan can satisfactorily demonstrate that thermal damage to concrete can be avoided when exceeding the specified temperature differential, based on the use of thermal analysis which inputs measured properties of the concrete mixture into the thermal computer program.

A10: Contract requirements to remain. Alternatives will be considered after award.

Q11: One of the local waterproofing companies is going to submit our MiraWeld or MiraPly (use at the airport) system for review via RFI. I think both systems match up well with the BOD SikaPlan WP 1130 but instead of automatically submitting 2 systems I thought I would ask if you definitely wanted a heat weldable system or are you open to looking at a system without heat welded laps as well.

A11: Heat welded systems are required.

Q12: Reference the stainless-steel drop pipe shown on drawings 430-S-02 & 430-

S-12 : What specification is applicable to the fabrication and installation of this pipe ?

A12: Refer to Item 3.2 and Item 3.3 in Addendum No. 9.

Q13: Reference drawing 430-S-12 : Please provide the grade of stainless steel required for the drop pipe that is indicated on this drawing

A13: Refer to Item 3.2 and 3.3 in Addendum No. 9

Q14: Reference Spec Section 07 10 50 Shaft Membrane Waterproofing System, paragraph 2.01.B.1.a : The specification section lists SikaPlan "WP 1125 - HL2" as a compatible PVC membrane, but the manufacturer refers to the product as Sikaplan "WP 1100-25 HL2". Please provide the correct product number for this application.

A14: Refer to Item 2.10 in Addendum 9.

Q15: Q&A No. 34 does discuss the MV Cable to the Switchgear in each building however it doesn't address my question below.
Is it the intent of the contract to replace the Medium Voltage Cable from the Switchgear at the Electrical Substation 650 to the Switchgear in each building for the following Cable Numbers listed on Drawing 430-ES-11 – Cable Schedule 1?
Cable Number:
BLDG 410 F-SWG-003A-410-1, F-SWG-003A-410-2, F-SWG-003B-410-1 & F-SWG-003B-410-2
BLDG 501 F-USS002-501(4A) & F-USS001-501(4B)
BLDG 923 F-USS002-923(13A) & F-USS001-923(13B)
BLDG 500 F-MSP-001-500, F-MSP-002-500, F-MSP-003-500,
BLDG 810 F-SWG003A-810-1, F-SWG003A-810-2, F-SWG003A-810-3, F-SWG003B-810-1, F-SWG003B-810-2, F-SWG003B-810-3

If the intent is to replace the complete circuit does ALCOSAN want to replace the new cable that is scheduled to be installed or is installed as part of the 1760E Project? Note: The change in routing for the feed to Building 923.
If the intent is to NOT replace the complete circuit can the designer designate the manholes that Medium Voltage Splices will be made?

A15: Intent is to replace all medium voltage cable listed on 430-ES-11. Contractor is to field verify the existing medium voltage runs then replace the conductors, this includes the cable being installed for the 1760E project that is listed in 430-ES-11.

Q16: Please confirm that the testing listed Specification Section 43 23 16-3.05.A.2, 3, 5 & 6 can be performed at Substantial Completion and only the performance testing (Specification Section 43 23 16-3.05.A.4) will need to be performed after the Ohio River Tunnel has reached Substantial Completion and a wet weather event resulting in wet weather pump station flow has/is occurring.

A16: Equipment Startup, Acceptance Testing, and Performance Testing are required before Facility Startup which is required prior to Substantial Completion. Refer to Section 01 75 00.

Refer to Item 2.3 of Addendum No. 9 which includes clarifications on testing of various systems prior to the connection of the Ohio River Tunnel and Item 2.1 of Addendum No. 9 which includes clarifications on sources of water for testing. Refer to Item 2.2 of Addendum No. 9 which includes clarifications to the Manufacturers Onsite Services.

Q17: Please confirm that once the WWPS Pumps have been installed, tested and commissioned and a Certificate of Substantial Completion has been issued the contractor is not responsible for the operation or maintenance of the pumps during the time between substantial completion and the performance testing, where the performance testing can not be completed until the wet weather pump station is experiencing flow from the Ohio River Tunnel.

A17: Contractor is not responsible for operation and maintenance of pumps after Substantial Completion.

Refer to the answer to Question #16 with respect to the timing of Performance Testing.

Section 43 23 16 Part 1.04B describes manufacturer's services that would occur after the Ohio River Tunnel is connected to the WWPS and is able to receive wet weather flow.

Q18: Please provide a draft "Start-Up Schedule" as described in Specification Section 01 75 00.1.91.A so the contractor may schedule the appropriate time and resources in its cost proposal.

A18: Refer to Item 2.3 of Addendum No. 9.

Q19: It says to REVISE second paragraph on page 1-17G, 1-17E, 1-17H, and 1-17P to state... but these pages are not the same for each set of bid documents. 1-17G is the Certificate of Minority and Womens Business Enterprise Participation but for the rest of the trades it is the Certificate of Compliance with the PA Steel Products Procurement Act.

A19: Refer to Item 1.1 in Addendum No. 9.

Q20: Paragraph 1.3, A., 11. of Addendum 4 on page 6 of 25 states " Contractor shall remove the barge within 2-weeks if requested in writing by the Owner" Does Alcosan anticipate the need to utilize the river wall frontage? Would the use be sporadic on an as-needed basis or a long-term continuous use?

A20: Specification Section 01 50 00 Parts 1.04.C and 1.02.B have been revised. Refer to Item 2.1 of Addendum No. 9.

Q21: Paragraph 1.3, A., 11. of Addendum 4 on page 6 of 25 states "Contractor access to the river wall shall be limited to two years from NTP." The real benefit of using the river wall occurs during the concrete operations in the shaft which starts at the end of the two-year window. The concrete construction period requires the most storage space for reinforcing steel, formwork, miscellaneous metals, and process piping. This is also the time period the HVAC, Electrical, and Plumbing Prime Contractors are on-site vying for the same realestate to store their materials. The use of the river wall frontage will reduce the congestion and construction traffic on a very compact site. Will Alcosan consider extending the two years to the life of the contract?

A21: See response to Question #20.

Q22: "Referring to Vol. 1, Art. 3, Sec 3.10-INDEMNIFICATION, can you please confirm whether the intent of this Section is for the Contractor to assume full indemnification responsibility even in circumstances where the Owner, Engineer, or Construction Manager is primarily (but not solely) at fault?

a. Specifically, is the Contractor expected to indemnify the Indemnified Parties (Owner, Engineer, Construction Manager) in cases where the Indemnified Parties are, for example, 99% responsible for the issue, so long as their fault does not rise to the level of sole negligence?"

A22: Yes; however, the language of Section 3.10 limits the indemnity obligation to those liabilities arising out of Contractor's Work on the Project "resulting in any way from any act or commission or omission of the Contractor, any subcontractor of the Contractor of any tier, or any person or organization directly or indirectly employed or engaged by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable." The sole negligence provision is an exception to the indemnification obligation whereby Contractor is not required to indemnify the Indemnified Parties for damages arising solely from the negligence of

the Indemnified Parties.

Q23: "Referring to Vol. 1, Art. 3, Sec 3.10-INDEMNIFICATION, "The Contractor shall be liable for, and shall protect, defend, indemnify and save harmless the Owner, the Consulting Engineer(s), the Construction Manager, and their officers, members, employees, agents and invitees, along with any other parties Owner has agreed to indemnify in connection with Work for the Project (hereinafter, the ""Indemnified Parties"")"

a. Please advise what other parties Alcosan has agreed to indemnify."

A23: None at this time.

Q24: Referring to Vol. 1, Art. 3, Sec 3.23-AUTHORITY OF THE OWER, Can you please clarify whether the Owner's authority under Section 3.23—to serve as the sole judge of the intent and meaning of the Contract Documents, with its interpretations being final, conclusive, and binding—supersedes or otherwise limits the applicability or effectiveness of the dispute resolution procedures outlined in Sections 2.38 (Dispute Review Board) and 3.56 (Disputes and Claims)?

a. Specifically, is it the intent of the contract that the dispute resolution process effectively starts and ends with the Owner's interpretation (Per Section 3.23), unless the Owner elects to engage the DRB (Section 2.38) or arbitration/legal proceedings (Section 3.56) at its sole discretion??

A24: This is not the intent. Section 3.23 provides that the Owner's interpretation of the contract documents is final and binding. However, Vol. 1, Art. 3SC, Sec. 3.56-DISPUTES AND CLAIMS provides a mechanism by which the Contractor may dispute the Owner's decision. That Section provides both the Contractor and Owner the right to refer disputes to the DRB, provided the conditions precedent to doing so have been satisfied.

Q25: Reference Article 3SC, Supplemental Contract Conditions, Property Insurance, pages Exhibit A-3SC-4 & Exhibit A-3SC-5 : "The Contractor shall purchase and maintain property insurance upon the Work at the site in the amount of the full replacement cost thereof. This insurance shall:" … "Be written on a Builder's Risk 'all-risk' or open peril or special causes of loss policy form that shall at least include insurance for physical loss and damage to the Work. … shall insure against at least the following perils: … flood, … flooding from ground water inflows and surface water inflows." Flood insurance for the full replacement value of the project, as stated in the Special Conditions, is not commercially available. Please sub-limit the flood, flooding from ground water inflows and surface water to a $2,500,000 limit

A25: Refer to Item 4.1 of Addendum No. 9.

Q26: Exhibit A – 3SC - Property Insurance section requires “flood” coverage. What is the flood coverage $ limit are you requiring?
A26: Refer to Item 4.1 of Addendum No. 9.

Q27: Is there a personal property and-or equipment use tax on this project ?
A27: ALCOSAN will not provide any tax advice, and bidders should direct this question to their accountant or tax professional.

END OF ADDENDUM No. 9

ATTACHMENT – A

Addendum No. 9 Specifications

SECTION 01 50 00
CONSTRUCTION FACILITIES, TEMPORARY CONTROLS AND UTILITIES

PART 1 GENERAL

1.01 SUMMARY

A. Furnish labor, materials, tools, equipment, and services for construction facilities, temporary controls and utilities, as indicated, in accordance with provisions of Contract Documents.

B. Completely coordinate with work of other trades and Owner.

C. Comply with the ALCOSAN Contract No. 1800 Wet Weather Pump Station "Contractor Personnel and Delivery Control Procedure" attached to this section (Attachment A).

1.02 SUBMITTALS

A. Administrative Submittals: Copies of permits and approvals for construction as required by Laws and Regulations, the Contract Documents, and governing agencies.

B. Shop Drawings: Contractor shall provide the following:

1. Temporary Utility Submittals:
   a. Electric power supply and distribution plans.
   b. Temporary utility relocation plans to accommodate plan relocation and/or Prime Contractor's temporary facilities/earth support for installation of planned work.
2. Temporary Construction Submittals:
   a. Contractor's field office, storage yard, and storage building plans, including gravel surfaced area.
   b. Staging area location plan.
   c. Plan for maintenance of existing plant operations.
   d. Submittals required as described in Part 1.04.C. Add. No. 9
3. Temporary Control Submittals:
   a. Noise, traffic, dust and access control plans.
   b. Plan for disposal of waste materials.

1.03 MOBILIZATION

A. Staging areas are designated on the Overall Laydown Storage and Site Access Plan within the Contract Drawings. The Contractor will be responsible to coordinate any required additional locations for staging of equipment, materials, and parking with the Construction Manager.

B. Use of Premises:

1. Separate areas will be designated for the Contractors' office and storage trailers, staging areas, and the Contractors' employee parking areas. The Contractor (and Subcontractors) shall use these areas only and shall not park at other areas of the plant site, including access roads, except to receive deliveries of materials. All plant roadways must be kept open at all times to allow for plant deliveries and normal operations of the plant personnel.

C. The Contractor shall coordinate the individual mobilization activities within this contract package. Mobilization shall include, but not be limited to, these principal items:

1. Obtaining necessary permits as may be required.
2. Moving Contractors' temporary facilities onto site.
3. Providing onsite communication facilities.
4. Submitting required schedules, submittals, etc.
5. Arranging for and erection of Contractors' work and storage yard.
6. Posting OSHA required notices and establishing safety programs and procedures.
7. Having the Contractors' Project Manager and/or Superintendent at the site full time during the period when work in the individual Contract is proceeding.
8. Early construction activities such as structural, mechanical and electrical demolition.

1.04 CONTRACTOR USE OF PREMISES

A. Property for use by the Contractor outside of ALCOSAN property is not furnished by the Owner for the Contractor to perform the work associated with this project. The Contractor is responsible to document coordination and approval of the ALCOSAN work site prior to mobilization.

B. Premises furnished by Owner upon which the Contractor shall perform the work are described below:

1. Contractor shall coordinate use of premises with the Construction Manager and shall assume properties on which Contract work takes place will be temporarily transferred to the custody of the Contractor. The Contractor then becomes responsible for all site activities except for those O&M activities which ALCOSAN staff must perform and for which purpose the Contractor will facilitate continuous access. Uses of premises includes, but is not limited to:
   a. Use the area(s) designated for Contractors' temporary facilities as shown on the Contract Drawings and directed by Construction Manager

C. Contractor may use the riverwall area along the load limit boundaries shown on Drawing 000-G-007 for barging provided the following conditions are met. Add. No. 4

1. Obtain written approval from the Owner.
2. Intended water access and riverwall uses must conform to the load limits defined on Drawing G-007 at all times.
3. Mooring of barges or otherwise imposing loads to the riverwall from the river side is not allowed.
4. Dredging outboard of the riverwall is not allowed.

5. Equipment that can be used for lifting, hoisting, conveying, excavating and trucking associated with barge operations cannot be placed on the riverwall.
6. Contractor is solely responsible for obtaining all permits for water access, river navigation, and temporary storage of barges along the river from authorities and agencies having jurisdiction. Contractor must provide all navigational controls and protection measures in compliance with permits.
7. The Contractor shall engage a qualified Professional Engineer licensed in the Commonwealth of Pennsylvania to: Add. No. 4
    a. Perform pre- and post- construction condition surveys of the riverwall in conformance with Specification 02 20 00.
    b. Prepare an engineering report and supporting calculations demonstrating that the Contractor's intended access points and riverwall uses maintain imposed loads below the limits defined on Drawing 000-G-007.
    c. Prepare a work plan detailing barge locations, access points, load locations, and protective measures during all work.
    d. Submit all surveys, reports and work plans sealed by Contractor's Professional Engineer for review by the Owner prior to start of work.
    e. Submit qualifications demonstrating that the Contractor's Professional Engineer is specialized in the design and analysis of cellular cofferdams, river walls, and waterfront structures, with a minimum of five years of recent experience and analysis of three cellular cofferdams projects of similar scale and complexity, where the Contractors' Engineer was the engineer-of-record in responsible charge.
8. Contractor must conform to the Geotechnical Monitoring requirements and limits defined on Drawing 430-GT-02 and Specification 31 09 13
9. Contractor is responsible for providing their own water side access equipment. No use of the Owner's ladders, gang ways or other equipment is acceptable.
10. Contractor shall repair any damage to the riverwall caused by barge storage, water side access, or coffer cell use for site access or work.
11. Contractor access to the riverwall shall be limited to the following periods:
    a. Owner will relocate Owner's barge through September 1, 2029.
    b. An attempt by the Owner will be made to extend this period but is not guaranteed at the time of Bid.
    c. Contractor shall remove the Contractor's barge within 2-weeks if requested in writing by Owner for issues including but not limited to cleaning of the stormwater and Main Pump Station overflow structures located along the river wall in this general vicinity. Add. No. 9
    d. Contractor shall remove the Contractor's barge within 72-hours if requested by Owner for emergency repairs.

1.05 RESPONSIBILITIES

A. The Prime Contractors shall provide whatever temporary facilities and controls as may be needed in their disciplines (as specified throughout this Section) for use by all Contractors and Subcontractors in this contract package at the site or sites of the work until the project is complete, on an as needed basis, and the project facilities are placed under the Owner's operation.

B. The Prime Contractors shall remove temporary facilities and controls in their disciplines and restore the affected area(s) when the temporary facilities and controls are no longer needed or required by Contract Time and extensions thereof.

C. The Prime Contractors shall include in the Bid the costs associated with the temporary utilities, facilities and controls provided in their respective contract and required by their means and methods in the execution of the work and subject to this specification section.

D. The Owner will pay for Prime Contractors' utilities consumption.

E. When shown on the plans or required by specification, relocation of utilities and appurtenances that impact finished work shall be the sole responsibility of the respective Prime Contractor described in Specification 01 11 00. In the event utilities and appurtenances require support and/or relocation for the convenience of the Prime Contractor's temporary facilities and/or support of earth, it shall be that Prime Contractor's responsibility to pay all support and/or relocation costs.

1.06 PERMITS

A. Permits, Licenses, or Approvals: Contractor shall obtain (and retain on site) any permits, licenses, and approvals necessary for the completion of the work as identified in this document, including but not necessarily limited to:

1. City of Pittsburgh Building permits for all applicable sub-codes.
2. The General Contractor shall obtain and pay for the City of Pittsburgh and Allegheny County Health Department Asbestos Abatement and Demolition Permits for removal of asbestos covered piping, if encountered.
3. The General Contractor shall obtain and pay for the City of Pittsburgh and Allegheny County Health Department permits for the removal of lead-based paint, if encountered, and any other required permits.
4. The General Contractor shall obtain and pay for the City of Pittsburgh and Commonwealth of PA Department of Labor and Industry elevator permits.
5. Each Prime Contractor shall install all facilities required under that permit in accordance with the Contract Drawings. The Drawings and Specifications associated with the permit shall be available at the Contractor's Office for review.
6. Each Prime Contractor shall obtain and pay for the City of Pittsburgh Building permits required for execution of the Contractor's work, including final Building permit issuance costs. The Owner has paid $17,650.00 toward BDA-2024-05947 permit application's Planning and Zoning plan review. This amount will be credited to the General Contractor's Building Permit amount. Prime Contractors shall obtain further PLI Building

Permits including Land Operations, HVAC, Electrical, Fire Alarm, Demolition System, and Suppression System.

7. The General Contractor shall obtain and pay for all blasting related permits and removal of river water permits.

B. The Owner will obtain any permits required by the regulating agencies of the Commonwealth of Pennsylvania and the United States of America. The Construction Manager will coordinate required Owner signatures on Contractor permit applications.

1.07 QUALITY ASSURANCE

A. Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to following:

1. NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations.
2. International Building Code, Chapter 33, Safeguards During Construction.
3. Local building codes.
4. Health and safety regulations.
5. Utility company regulations.
6. Police, fire and rescue rules.
7. Environmental protection regulations.
8. Local agencies requirements and regulations.

B. Maintain required exits, existing structural elements, fire protection devices and sanitary safeguards during remodeling, alterations, repairs or additions to any building or structure, except; make adequate substitute provisions when such required elements or devices are being remodeled, altered or repaired, or when existing building is not occupied.

C. Arrange for authorities having jurisdiction to inspect and test each temporary utility before use.

D. Obtain and include in base bid certifications, permits for temporary utilities, fees, labor and materials for necessary services.

E. Locate facilities to serve Project adequately and result in minimum interference with performance of work.

F. Relocate and modify facilities as required.

1.08 TEMPORARY UTILITIES – GENERAL NOTES

A. Unless otherwise specified, the Contractor is responsible and pays for the installation of the temporary utility system.

B. Telephone Service:

1. Contractor shall arrange and provide for onsite telephone service for Contractor use during construction Contractor shall pay for the cost of installation, equipment and monthly bills. No incoming calls to the Contractor will be allowed via the Owners telephone system.

C. Maintain temporary services and facilities clean and neat in appearance, including those furnished or provided by Owner for Contractor's use.

D. Coordinate with Owner to relocate temporary services and facilities as work progresses.

E. Do not overload facilities or permit them to interfere with progress.

F. Take necessary fire prevention measures.

G. Preclude hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on site.

H. Prepare schedule indicating dates for implementation, shutdowns, tie-ins, and termination of each temporary utility and coordinate with Owner.

I. At earliest possible time, when acceptable to Owner, change over from use of temporary service to use of permanent service.

J. Remove temporary equipment and connections and leave premises and existing permanent apparatus in an equivalent condition as existed prior to making temporary connections.

1. Service utility connections shall be discontinued and capped in accordance with the approved rules and the requirements of the authority having jurisdiction.
2. At completion of work, remove and replace damaged parts of permanent systems.

K. Extend warranty or guarantee period on permanent systems used during construction period so they commence on date of Substantial Completion.

L. Abuse of any Owner-paid utility by the Contractor will warrant to the Owner the right to discontinue use of said utility and force the Contractor to supply said utility needs.

1.09 WEATHER PROTECTION

A. Prior to enclosure of building, provide temporary heating, ventilation, and cooling as required to perform work activities.

B. Provide temporary insulated weathertight closure of exterior openings to accommodate acceptable working conditions and protection for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual Sections and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.10 TEMPORARY HEATING, VENTILATION, AND COOLING

A. Maintain temperature of spaces where concrete is being placed or cured as well as other temperature and humidity sensitive operations (i.e. painting). See Division 03 Concrete, and Division 09, Finishes.

B. Provide temporary heating, ventilation, and cooling equipment; and provide temporary heating ventilation, and cooling as required to perform work. All costs of temporary heating, ventilation and cooling is the responsibility of the Contractor whose work requires the conditioned space.

1. Substantially complete exterior envelope prior to start of energy systems.
2. Make temporary electrical connections and disconnect temporary connections at completion of temporary heating, ventilation and cooling period.
3. Operate system, furnishing necessary labor and supervision.
4. Maintain interior temperature and humidity at service temperature and service humidity for at least 48 hours prior to, concrete slab moisture emission and relative humidity testing, and continue through placement of interior finishes, and until Substantial Completion. Heating units shall be vented.
    a. Provide temperature and humidity range required by interior-finish manufacturer's instructions.

C. Select equipment that is harmless on occupants, elements being installed and completed installations.

D. Coordinate requirements to produce condition required and minimize consumption of energy.

E. Provide adequate forced ventilation of enclosed areas for welding, painting, curing of installed materials and fume producing equipment, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors, or gases.

F. Prior to operation of permanent equipment for temporary heating purposes, verify that installation is acceptable for operation, equipment is lubricated, and filters are in place.

G. Provide and pay for operation, maintenance and regular replacement of filters, and worn or consumed parts.

H. Use devices complying with codes and ordinances.

1.11 TEMPORARY ELECTRICITY AND LIGHTING

A. Electrical Energy:

1. The Owner will make available a 480-volt power supply connection points for use by the project. The available temporary power and capacity may be sourced from:
    a. Building 410 Energy Recovery Facility – East Side, Second Floor Level from:
        - MCC022-410, Bucket (71) - 150A, 480V, 3PH

- MCC025-410, Bucket (4E) – 250A, 480V, 3PH and Bucket (7B) – 250A, 480V, 3PH.

b. Coordinate with the Owner for protective device restrictions and maximum settings.

2. During the construction phase of this contract, some existing power distribution equipment, located within the contract area, will be required to be de-energized and/or removed. It will be the Electrical Contractor's responsibility to supply and maintain a temporary electrical service to equipment requiring electrical service, and/or replacement in order to maintain plant operations per Section 01 52 00, Maintenance of Plant Operations. Unless noted otherwise, equipment requiring electrical service is not limited to just the specific pieces of equipment shown or stated in the Contract Documents, but to all loads serviced by the de-energized and/or removed distribution equipment.
3. The Electrical Contractor shall provide and pay for all temporary wiring switches and connections required as shown per plan. Any other temporary wiring and connections not shown or required for other Prime Contractor's means and methods in execution of the work shall be the responsibility of that Prime Contractor.
4. All temporary electrical installations shall be removed by the respective prime Contractor that installed the temporary installation as referenced in the previous paragraph at the time required by construction scheduling or upon completion of the contract work, at no additional cost to Owner.
5. Each Prime Contractor may provide portable electrical generating equipment for electrical requirements as long as said equipment complies with federal, state and local environments regulations.
6. Electrical Contractor shall be responsible for providing power to all field office trailers onsite.

B. Lighting:

1. The Electrical Contractor shall provide sufficient electric lighting where needed so that all work may be done in a workmanlike manner when there is not sufficient daylight and in accordance with OSHA guidelines.
2. Temporary Site Lighting shall be provided as follows:
   a. Fixed temporary lighting shall be provided for primary road access and entry, laydown areas and general site perimeter affected by the work within the Limits of Disturbance.
   b. Portable lighting shall be provided associated with all open excavations and hazardous areas to protect personnel from sunset to dawn while work is being performed.

1.12 TEMPORARY WATER

A. The Contractor shall provide temporary facilities and piping required to bring temporary water to the points of use and remove them when no longer required.

B. Water for testing concrete structures for water tightness is described in Section 01 45 25.

C. Water for testing wet weather pumping systems shall be river water as described in Section 01 75 00.

D. Water for any required retesting is the Contractor's sole responsibility.

E. Other water for construction purposes shall be obtained from the existing water system as directed by the Construction Manager.

Add. No. 9

F. No guarantee is made of available pressure or flowrate of temporary water made available by Owner.

G. Provide reduced pressure zone backflow preventers in accordance with applicable codes for all temporary connections to potable water.

H. Each Prime Contractor shall furnish drinking water for Contractor personnel connected with their work.

1.13 TEMPORARY SANITARY FACILITIES

A. The Contractor is advised that the work to be performed under the contract is in an operating sewage system. The Contractor is advised that it should consider all factors that may affect employee hygiene, including, but not limited to, air quality, ventilation, contact with process liquids, chemicals and other elements of the environment.

B. The Contractor must take all precautions required for compliance with all applicable regulatory requirements and as necessary to provide an appropriate hygiene program for its employees.

C. Provide temporary sanitary facilities for use of construction workers during construction, remodeling or demolition activities. Owner will not provide nor maintain sanitary facilities for the Contractor workforce.

D. Use of Owner's existing sanitary facilities will not be allowed.

E. Provide toilet facilities complying with local, State and Federal sanitary laws and regulations.

F. Maintain and service in clean and sanitary condition.

G. Provide adequate supplies of toilet paper, cleaning and other required items.

1.14 TEMPORARY OWNER STAFF PROTECTION

A. Protect Owner staff from injury due to construction activities by temporary barriers or covered walkways or both, and by construction railings in accordance with following guidelines:

1. Provide temporary barrier and covered walkway when distance from construction activities is not more than one-fourth height of construction.
2. Provide temporary barrier protection when distance from construction activities is between one-fourth and one-half height of construction.
3. Provide temporary construction railings when distance from construction activities exceeds one-half height of construction.

B. Provide signage to direct pedestrian traffic.

C. Provide walkway staff to travel in front of construction site, or as directed by authority having jurisdiction.
   1. Provide walkways minimum 4 feet in width.
      a. Increase width as required to accommodate pedestrian traffic.
   2. Provide walkways in accordance with governing Accessibility Code with well- drained, durable non-slip walking surface.
   3. Design walkways to support imposed loads no less than a design live load of 150 psf.
   4. Provide construction railings minimum 42 inches in height.
      a. Railings direct pedestrians around construction areas.

D. Install barriers minimum of 8 feet in height on side of walkway nearest construction.
   1. Extend barriers entire length or width of construction site.
   2. Protect pedestrian openings in barriers with doors or gates which shall be accessible only by Owner, Contractor and authorized visitors.
   3. Design barriers to resist loads required in accordance with International Building Code, Chapter 33.

E. Erect covered walkway with minimum clear height of 8 feet measured from floor surface to canopy overhead.
   1. Extend covered walkway entire length or width of construction site for safe, protected passage of individual persons along adjacent public streets.
   2. Provide as minimum protective plywood sheathed enclosure walls.
   3. Provide adequate lighting and warning signs.
   4. Designed to support imposed loads in accordance with International Building Code, Chapter 33 and requirements of authorities having jurisdiction.

F. Protect pedestrian traffic by directional barricades where walkway extends into street or drives.
   1. Construct directional barricade of sufficient size and construction to direct vehicular traffic away from pedestrian path.

G. Pedestrian protection shall be maintained in place and kept in good order for entire length of time pedestrians may be endangered.
   1. Upon completion of construction activity, immediately remove walkways, debris and other obstructions and leave such property in as good a condition as it was before such work was commenced.

H. Enclose excavations on a site located 5 feet or less from street lot line with a barrier not less than 6 feet high.
   1. Where located more than 5 feet from the street lot line, erect a barrier as required by authorities having jurisdiction.
   2. Resist wind pressure specific to location.

1.15 PARKING AREAS

A. Contractor shall control vehicular parking, subject to the Construction Manager's approval, to preclude interference with plant traffic or parking, access by emergency vehicles, Owner's operations, or other concurrent construction operations.

B. The Construction Manager will coordinate parking facilities for the Contractor's employees working on the Project. The Contractor's employees or equipment parking will not be permitted on the Owner's site unless written permission has been granted by the Construction Manager. Contractors' equipment will only be allowed on Owner's property when the equipment is being utilized on this project.

C. As defined in **Attachment A**, each Prime Contractor is allowed a limited number of Contractor vehicles to be parked or driven onto the Owner's plant site and must be registered with the main gate guardhouse to receive a vehicle identification tag. Vehicle identification must be displayed whenever the vehicles are on the site.

D. Owner may adjust Contractor and subcontractor allowances for vehicular parking dependent upon Contractor compliance with contract requirements for parking and staging areas, plant traffic, access for emergency vehicles, Owner's operations and maintenance needs, or other concurrent construction operations.

1.16 PROTECTION OF WORK AND OWNER PROPERTY

A. Perform all work within contract limits in a systematic manner that minimizes inconvenience to the Owner's operations.

B. Wherever completion of work requires the temporary or permanent removal and/or relocation of an existing utility, coordinate all activities and perform all work to the satisfaction of the Construction Manager. Keep all valves and other controls required for regular operations of the Owner's facilities free from obstruction and available for use at all times.

C. Finished Construction:

1. Protect finished floors, walls and ceilings, architectural items, doors and windows, and all other finished work as necessary until work is completed.

D. Provide approved containers for collection and disposal of waste materials, debris, and rubbish. At least at weekly intervals, dispose of such waste materials, debris, and rubbish off site.

E. When requested by the Construction Manager, Contractor will clean work areas, pick up and properly dispose of all debris.

1.17 PROTECTION OF ADJOINING PROPERTY

A. Protect adjoining public and private property from damage during construction, remodeling and demolition work.

1. Protect footings, foundations, party walls, chimneys, skylights and roofs.

2. Control water runoff and erosion during construction or demolition activities.
3. Provide written notice to owners of adjoining properties advising of construction plans and excavations to be undertaken 14 calendar days prior to the scheduled date of excavation.

B. Comply with all health, safety and environmental laws in the General Contract Conditions while on the Owner's property.

C. Inform the Construction Manager of accidents resulting in personal injury or damage to Owner's facilities on the site or damage to other public or private property, as well as, related claims.

D. Use of Explosives:
1. No blasting or use of explosives will be allowed with the exception of work described in Section 31 71 16.

E. During the performance of the work, the Contractor shall adapt his/her means, methods, techniques, sequences and procedures of construction so as to allow the Owner to maintain the plant's operation at the existing level of wastewater treatment. In performing such work, and in cooperating with the Owner to maintain operations, it may be necessary for the Contractor to plan for, design, and install various temporary services, utilities, temporary piping, heating, access, and similar items which will be included within the Contract Price.

1.18 TEMPORARY STORAGE AND STAGING AREAS

A. Store and place construction equipment and materials so as not to endanger public, workers or adjoining property for duration of project.

B. Comply with provisions of authority having jurisdiction for temporary use of streets or public property for storage or handling of materials or of equipment required for construction or demolition, and the protection provided to the public shall.

C. Construction materials and equipment shall not be placed or stored so as to obstruct access to fire hydrants, standpipes, fire or police alarm boxes, catch basins or manholes, nor shall such material or equipment be located within 20 feet of a street intersection, or placed so as to obstruct normal observations of traffic signals or to hinder the use of public transit loading platforms.

D. Building materials, fences, sheds or obstruction of any kind shall not be placed so as to obstruct free approach to any fire hydrant, fire department connection, utility pole, manhole, fire alarm box or catch basin, or so as to interfere with the passage of water in gutter. Protection against damage shall be provided to such utility fixtures during the progress of work, but sight of them shall not be obstructed.

E. Prior to start of work, meet with installers to arrange and prepare plotted plan defining staging, storage, field office and traffic areas.
1. Obtain Owner's approval of plan.

2. Except as specifically provided, working and storing outside these areas will not be permitted.
3. Arrange and locate temporary structures and storage to avoid interfering with construction.

F. Within area designated for Contractor and subcontractor's use, Contractor and subcontractors shall provide suitable and sufficient enclosed and covered spaces, with raised flooring, to protect materials and equipment from damage by weather or construction work.
1. Maintain storage and working areas in clean and orderly condition.

G. Temporary Storage Facilities: Contractor shall construct temporary storage facilities so that stored equipment and materials are not subject to damage by weather conditions.

H. Contractor shall maintain temporary storage and laydown areas in a clean condition, free from debris and regularly mow grass and cut vegetation.

1.19 TEMPORARY FIRE EXTINGUISHERS

A. Structures under construction, alteration or demolition shall be provided with not less than one approved portable fire extinguisher and sized for not less than ordinary hazard as follows:
1. At each stairway on floor levels where combustible materials have accumulated.
2. At each storage, construction shed and temporary construction office.
3. Provide additional portable fire extinguishers where special hazards exist, such as storage and use of flammable and combustible liquids.

B. Strictly observe provisions of codes to safeguard against fire hazards attendant upon construction operations.

1.20 TEMPORARY STAIRWAYS

A. Provide stairways required for access and egress from construction.

B. Where a building has been constructed to a height greater than 50 feet or four stories, or where an existing building exceeding 50 feet in height is altered, at least one temporary lighted stairway shall be provided unless one or more of the permanent stairways are erected and lighted as construction progresses.

C. Required means of egress shall be maintained at all times during construction, demolition, remodeling or alterations and additions to any building.

1.21 FIRE PROTECTION STANDPIPES

A. Contractor shall provide temporary standpipes as required by NFPA 241, the Authority Having Jurisdiction and other applicable governing codes.
1. Such standpipes shall be provided with fire department hose connections at accessible locations adjacent to usable stairs.

2. Such standpipes shall be extended as construction progresses in such a manner that they are always ready for use.
3. Standpipes shall be either temporary or permanent in nature, and with or without a water supply, provided that such standpipes conform to the requirements of codes as to capacity, outlets and materials.
4. Water supply for fire protection, either temporary or permanent, shall be made available as soon as combustible material accumulates.

1.22 AUTOMATIC SPRINKLER SYSTEM

A. In buildings where an automatic sprinkler system is required by Code, it shall be unlawful to occupy any portion of a building or structure until the automatic sprinkler system installation has been tested and approved.

B. Operation of sprinkler control valves shall be permitted only by properly authorized personnel and shall be accompanied by notification of duly designated parties.

1. When sprinkler protection is being regularly turned off and on to facilitate connection of newly completed segments, the sprinkler control valves shall be checked at end of each work period to ascertain that protection is in service.

1.23 TEMPORARY FENCES AND BARRICADES

A. Furnish, install and maintain temporary fences, barricades, trench and hole covers, warning lights and safety devices necessary to prevent injury to persons and damage to property.

1. Provide padlocks manufactured by Knox keyed to the Fire Department keying system to the construction areas.
2. Provide 24-foot wide gates to facilitate Fire Department access.
3. Fire Department apparatus shall be able to turn into construction site in one turn.

B. Contractor is responsible to design construction barricades and fences with proper sizes of members and with adequate supports to protect public from injuries or accidents, arising from construction work.

C. Each Contractor shall provide acoustical barriers so noise from tools or equipment will neither exceed legal noise levels nor interfere with plant operations.

D. Each Contractor shall provide and maintain temporary dust tight partitions, bulkheads, or other protective devices during construction to permit normal operation of existing facilities. Construct partitions of plywood, insulating board, plastic sheets, or similar material(s). Construct partitions in such a manner that dust and dirt from demolition and cutting will not enter other parts of existing building or facilities. Remove temporary partitions as soon as the need no longer exists.

1.24 TEMPORARY ACCESS

A. Provide and maintain required stairs, runways, guard rails, platforms, floor openings and similar temporary construction, for duration of work and performance of construction operations.

1. Provide type and arrangements as required for their specific use; shall be substantially constructed throughout, strongly supported, and well secured.

B. Permanent stairways may be used if protected against damage.

C. Contractor's access to construction area will be permitted only through designated approaches in such a manner that traffic will not interfere with Owner's activities.

1.25 TEMPORARY SIGNAGE

A. Provide, maintain, and remove temporary signage throughout Project, both interior and exterior, when no longer required, including those required by prevailing code requirements and Authorities having jurisdiction.

1. Such signage shall include, but not be limited to, signage as may be required for issuance of Certificates of Occupancy (CO), both Temporary (TCO) and Final (FCO).

1.26 TEMPORARY PROTECTION

A. Protect work in progress and adjoining materials in place during handling and installation.

B. Supervise construction operation to assure that work, completed or in progress, is not subject to harmful, dangerous, damaging or otherwise harmful exposure throughout construction period.

1. Prevent accumulation of water on site:
   a. Remove standing water.
   b. Pump or direct away from site and adjoining property.
2. Prevent accumulation of water on slabs, adjacent to building or foundations, or in utility trenches.
3. Prevent damage to structural members.

C. Apply protective covering to assure protection of work from damage or deterioration.

1. Remove coverings at Substantial Completion.

D. Adjust, lubricate and maintain operable components to assure operability without damaging effects throughout construction period.

1.27 SECURITY

A. All of the Contractors' employees will be issued identification badges, which must be worn whenever the employees are on the plant site.

B. Provide security and facilities to protect work and existing facilities and Owner's operations from unauthorized entry, vandalism or theft. Coordinate with Owner security force.

C. The Contractor's employees must enter the Owner's plant site at the Main Gate unless directed otherwise by the Construction Manager.

1.28 TEMPORARY ACCESS ROADS

A. Provide access on building site as required to perform work.

B. Maintain construction site access roads free of obstruction.

C. Clean up debris, materials, etc., that falls from vehicles in route to and from site.

D. Do not block access to Owner's facilities. Refer to Drawings for general traffic routes.

E. When this access is no longer required, restore to its original condition.

F. Provide means of removing mud from vehicle wheels before leaving site and entering public streets or Owner's roads.

1.29 TEMPORARY PARKING

A. Approved Prime Contractor and subcontractor parking must be limited to staging areas designated in the contract documents.

B. For parking requirements above those allowed in this specification, provide additional off-site parking and transport employees to the plant.

C. Do not allow heavy vehicle or construction equipment on existing plant parking areas without Owner approval.

1.30 TRAFFIC CONTROL

A. Contractor's vehicular traffic must comply with the Owner's requirements. The Construction Manager will coordinate vehicular traffic and identify for the Contractor all access points (gates), parking areas, and off-limits areas within the plant.

B. Provide traffic control necessary to effect smooth Owner operations.

C. Provide and maintain adequate traffic control and flagmen's services at points where transporting of equipment and materials engaged on work, enters and exits from project site and on site.

D. During the performance of the work, General Contractor shall furnish labor, equipment, and materials to control dust always in and around the work area, including evenings, holidays, and weekends.

1.31 WASTE MANAGEMENT FACILITIES

A. Maintain facilities for separate collection of construction wastes and materials.

B. Do not dispose of volatile or hazardous wastes into storm or sanitary drains. Disposal of wastes into streams or waterways is prohibited. Contractor shall provide acceptable containers for collection and disposal of waste materials, debris, and rubbish.

1.32 COMPLETION OF WORK

A. Upon completion of work or as progress of work dictates or sooner if directed by Construction Manager, remove temporary facilities, and return improvements on or about site and adjacent property which are not shown to be altered, removed or otherwise changed; to condition which existed previous to starting work.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

ATTACHMENT A

ALCOSAN Contract No. 1800, Wet Weather Pump Station

Contractor Personnel and Delivery Control Procedure

Contractor is responsible for controlling its personnel and on-site traffic on the property of ALCOSAN Woods Run WWTP. The following procedure is incorporated into the Project Manual for implementation beginning with Notice to Proceed.

1) REGULAR WORKFORCE PERSONNEL – ENTERING PLANT PROPERTY NORMAL WORKING HOURS

a) Each Prime Contractor (Contractor) is allowed **two** autos or pick-ups (vehicles) onto the project site. The vehicles shall be registered with ALCOSAN to **two** Contractor personnel who will be issued card-reader (access) Cards for access to the Plant through the right gate at the ALCOSAN Security (Security) Station off of Preble Avenue. These access passes shall not be shared for security reasons.

b) **One** vehicle per subcontractor will be allowed on site when the subcontractor is working on site. This vehicle and its passengers will register at the Security Station as a subcontractor. This allowance is conditional upon contractor control of vehicle parking in its staging areas.

c) Security will need the make, model, color license plate of the Contractor vehicles parked on site. They have a vehicle registration form that should be filled out when ALCOSAN ID access badge is issued.

d) Excluding the Contractor personnel mentioned above, all Contractor regular workforce personnel shall park off site. This parking shall be coordinated/arranged by the Contractor. Off-site parking shall not violate public or private restrictions.

e) Contractor regular workforce personnel parking offsite shall enter the Plant in a Contractor provided bus or van (bus) which can be parked on site in an assigned staging area after discharging regular workforce personnel at the Contractor's site office/staging area. The bus driver shall be an employee of the Contractor and must follow the approved Contractor access route and speed limits at the time through the Plant.

f) Bus driver, or some responsible Contractor employee on the bus, shall maintain a daily roster of Contractor personnel identifying who is on the bus at the time it pulls up to the Security Station in the left lane. The passenger roster shall be given to the Security Guard who will verify the identity of the passengers. It will be the responsibility of the Contractor to provide an accurate roster of daily personnel entering the Plant. The roster shall remain with the Guard who will keep the original and provide Contractor with a copy of the roster. Contractor should keep this copy of the roster to identify who is on the bus when the bus leaves the Plant at quitting time. Contractor personnel on the roster that leave the plant prior to the expected end of their shift shall sign out at Security so that their name can be taken of the roster of remaining personnel on site.

g) New union personnel may be on the bus/van when it enters the site, but their name must be on the roster and identified as new personnel. After new personnel have been registered at the Contractor's site office he/she will be given a color-coded badge by the Contractor (see Badging Section).

h) Contractor bus shall discharge passengers at the Contractor's site office/staging area .

i) Contractor regular workforce personnel wanting to enter the Plant during the course of the workday shall park off site, walk to the Security Station and identify themselves and who they work for. That person's employer will be notified by Security to come to the Security Station to retrieve them. This person's name will be added to Security's copy of the Contractor's daily roster of regular workforce personnel in order to track all of the Contractor's personnel on site that day.

2) AFTER-HOUR WORKFORCE PERSONNEL – ENTERING PLANT PROPERTY BEYOND NORMAL WORKING HOURS

a) Contractor shall identify and give Security 24 hours' notice of Contractor after-hour personnel working before or after normal shifts and on weekends and holidays. These personnel will not be part of shift personnel but persons entering on site to do maintenance or refueling work on equipment, prep work for early morning/next day concrete pours, etc..

b) 24-hour advance notice shall include a list/roster of after-hour workforce personnel requiring access on site and who the responsible on-site person in charge is for the Contractor. This can be part of a Visitor Request Form (VRF). (CM will provide.)

c) After-hour personnel working before and after regular/scheduled shift work, weekends and holidays will be allowed vehicles on site. At no time shall the number of Contractor vehicles on site exceed the number allowed. After-hour workforce personnel will report to the left lane of the Security Station, identify themselves and Security will check their names against the Contractor-provided list/roster on the VRF. After-hour personnel not on the roster will not be signed in and allowed into the Plant unless they are retrieved by a responsible person-in- charge for the Contractor.

d) On second and third shifts, weekends or holidays when the Contractor has a large complement of its forces working it shall follow the procedures outlined above in Step 1.

e) Regular workforce personnel who are to remain on site after normal shift work shall be considered after-hour workforce personnel. See Step 3.

3) REGULAR WORKFORCE PERSONNEL – EXITING PLANT PROPERTY

a) Contractor regular workforce personnel exiting the Plant at the end of the work-day shall exit on the same or similar bus/van/truck (bus) that brought them to work that morning. The bus driver shall be an employee of the Contractor and must follow the approved Contractor access route and speed limits at the time through the Plant. The bus shall leave the Plant immediately after Contractor personnel are on board.

b) Bus driver, or some responsible Contractor employee on the bus, shall use that day's roster of Contractor regular workforce personnel identifying who is on the bus at the time it pulls up to the west side of the Security Station. The passenger roster shall be given to the Security Guard who will verify the identity of the passengers who are leaving the Plant and who is still on site. The roster shall remain with the Guard who will make a copy for the Contractor.

c) Using the Contractor's daily roster submitted and updated during the course of the workday in Steps 1d, 2b and 3b Security is aware of Contractor regular workforce personnel entering and leaving the Plant. The roster is critical in identifying who is and is not on the Plant in case of emergencies and evacuations.

d) Those regular workforce personnel remaining on the site beyond normal quitting time will be considered after-hour workforce personnel. See Step 4.

4) AFTER-HOUR WORKFORCE PERSONNEL – EXITING THE PLANT PROPERTY BEYOND NORMAL WORKING HOURS

a) After-hour workforce personnel will be on site weekdays before and after normal working hours, weekends and holidays. Documentation of their presence at the Plant is addressed in Steps 2 and 3.

b) When exiting the Plant after-hour workforce personnel will identify themselves to Security who will verify whether or not they are on that day's roster of remaining on site personnel.

c) If for some reason the after-hour workforce personnel leaving the site in Step 4b is not on that day's roster that person(s) will confirm their identity with Security and be allowed to leave the site. Security will notify the CM the next working day of the discrepancy in the Contractor's roster information.

5) CONTRACTOR VISITORS TO THE SITE

a) This procedure applies to visitors to the Contractor at the Plant. This could include but not be limited to corporate staff, meeting attendees, salespersons, business agents, suppliers, manufacturer representatives – any persons not a regular on-site member of the Contractors site work forces covered on their daily roster.

b) CM shall give ALCOSAN Security advance notice of Visitors expected to the site by way of a Visitor Request Form (VRF). (CM to Provide). Contractor shall fill out this Form and send to the CM with the information necessary so that the CM can submit it to ALCOSAN Security. Contractor shall submit the information to the CM 24 hours in advance of the Visitors expected arrival time.

c) Security will direct Visitors to park in any available parking space closest to the location of their meeting but no further **north than the parking places in front of the ALCOSAN Administration Building** after checking in at the left lane of the Security Station off of Preble Avenue. Visitors shall present identification and sign in. Security shall verify the VRF against the information presented by the Visitor. Visitor will be issued a temporary badge.

d) Once Visitor credentials are confirmed Security will call the Contractor contact given on the VRF notifying them that their Visitor has arrived. Contractor shall retrieve their Visitor where they are parked.

e) Should there not be a VRF with Security in anticipation of a Visitor that arrives at the Plant the Visitor will not be allowed entrance to the Plant. Security must have a VRF to allow entry into the plant.

f) Exiting Visitors shall be escorted by the Contractor to their parking spot. Visitors shall exit through west side of Security Station signing out.

6) CONTRACTOR DELIVERIES TO THE SITE

a) There will be various types of deliveries/traffic in and out of the Plant to support Contractor work activity. In general, they can be categorized as the following:

i. Type 1 - 'Light' deliveries – FedEx/UPS type deliveries in the way of vans, pickups, two-axle box truck and the like.
ii. Type 2 - 'Medium' deliveries/traffic – dump trucks, concrete trucks, and the like that will enter and exit the site in a continuous repetitive manner over a period of time. Contractor will submit to the CM a Delivery Notice Form for Type ii deliveries.
iii. Type 3 - 'Heavy' deliveries – 18-wheeler semi-trailer truck, low boys, large equipment deliveries, and the like. Contractor will submit to the CM a Delivery Notice Form for Type 3 deliveries.

b) There are two entrances into the Plant – through the Security Station off of Preble Avenue and the Tracy Street Entrance at the southwest corner of the Plant at the end of Tracy Street. Generally, traffic will be routed as follows. Exceptions can be made at ALCOSAN's discretion, in advance of traffic arrival/departure.
   i. Preble Street Entrance – Types 1 & 3 traffic, and Type 2 traffic when directed by Alcosan and as described below in paragraph d.)
   ii. Tracy Street Entrance – Type 2 traffic as described below in paragraph d.)

c) 'Type 1' deliveries will be made through the Security Station.
   i. Driver shall check in at the left lane. Driver shall have its contact and contractor information on the deliverable. Deliveries shall not be made care of ALCOSAN or the CM or the delivery will be turned away.
   ii. Contractors will be notified by Security of the delivery. Because of the volume of construction work and traffic on site these delivery vehicles will not be allowed on site to drive to the Contractors site office so the Contractor will have to retrieve deliveries **at the Security Entrance**.

d) 'Type 2' deliveries /traffic will generally be limited through the Tracy Street entrance based on the scheduled traffic restrictions during shaft construction as described on the Overall Site Utilization and Access Plan. A specific exception request due to anticipated volume (concrete and earthwork) and time sensitivity (concrete) of traffic and location of the related work may be permitted by ALCOSAN. Upon ALCOSAN approved exception or ALCOSAN direction Type 2 deliveries/traffic may be allowed or may be required to enter the Plant at the Preble Avenue entrance.
   i. 24 hours prior to the day of the anticipated truck traffic the Contractor will notify the CM via a Construction Delivery Notice Form (DNF) of the anticipated truck volume. (DNF form provide by the CM) Contractor shall fill out this Form and send to the CM with the information necessary so that the CM can submit it to ALCOSAN Security.
   ii. Vehicle must follow the approved Contractor access route and speed limits at the time through the Plant.
   iii. CM will submit to Security the DNF with the Contractor's delivery/traffic information. CM will coordinate Plant Entrance to be used for the deliveries/traffic with Security and notify Contractor.
   iv. At the Preble Avenue entrance drivers will enter the left side visitor entry and Security will document the entry on the ALCOSAN Daily Delivery Log. Outbound traffic will be checked out at the west side of the Preble Avenue gate, the exit time recorded and their exit time will be recorded on the delivery log. A similar process will be followed at the Tracy Street gate during the restricted time period for shaft construction or when traffic is directed to the Tracy Street gate by ALCOSAN.

v. There may be a line placed on the road or a sign erected at self-opening gates so that drivers know how closely they should approach the gate to get it to open. Leaving the east road gates open during the day is only an option on a high volume delivery day if traffic is backing up and deemed necessary. ALCOSAN priority will always be to secure the plant by keeping the gates closed unless an exception is needed. There will always be the pull up option and gate will automatically open.

vi. At the Tracy Street entrance: This entrance will be manned every day with a computer. The same documentation process applies at both Tracy and Preble Main entrances; the officer assigned to Tracy entrance will have the same access to the DNF as the main security office and he/she will record entry/exit times for all deliveries.

e) 'Type 3' deliveries will be made through the Security Station.

i. Generally, these types of deliveries will involve large deliveries of heavy construction equipment, sheeting and rebar, construction materials, etc. transported by 18-wheel semi-trailer trucks or 'low boys' with limited turning radius and backing up capabilities.

ii. CM will submit to Security the DNF with the Contractor's delivery information.

iii. Use of the Tracy Street Entrance for these vehicles is restricted by Alcosan and may not be practical because of road conditions on site that do not suit these types of vehicles. Therefore, the Preble Street Entrance will be most likely be used. There are width considerations the Contractor must consider for wide loads at the Preble Street Entrance location. Therefore, some oversized loads may have to go through the Tracy Street Entrance with Alcosan's permission.

iv. Vehicle must follow the approved Contractor access route and speed limits at the time through the Plant.

v. Delivery vehicle shall pull up to the Security Station in the Visitor's lane and the Driver will present identification and paperwork on deliverables. Security will check against the DNF for that delivery.

vi. Vehicle will be allowed to pull up in proximity to the WWPS jobsite where the contractor will retrieve it to take it back to the site. Contractors should be expecting the call from Security so they can receive the delivery in a timely fashion; this is crucial to ensure there is not a delay in the communication process which could potentially cause a traffic back-up on site.

vii. Contractor becomes responsible for the delivery vehicle from the time it retrieves it until it returns it to the point of retrieval

viii. If the delivery does not meet the information on the DNF it will not be allowed further into the Plant until the Contractor accurately reconciles with Security the content of the deliverables.

ix. Delivery vehicle, escorted by the Contractor, will exit the Plant through the incoming right lane at the Security Station stopping at the barrier Arm. Special exceptions such as these will need to be coordinated with Security to ensure a safe traffic pattern for all; when possible, the Contractor will escort the delivery vehicle to exit out the Tracy Street gate exit if directed by ALCOSAN to mitigate issues that may arise by using the Preble Avenue entrance/exit area.

7) BADGING CONTRACTOR PERSONNEL

a) ALCOSAN will turnover color-coded badges to the Contractor to give to its personnel at the start of their employment with the Contractor. The Contractor will assign badge numbers to its personnel and keep a record of badge number/personnel assignments. This record shall be copied to Security. At the end of personnel employment, the Contractor will recover the badge from the terminated personnel.

b) All Prime Contractors that receive a parking space will receive a project-term Alcosan Photo ID access badge granting them right side arm gate access for the main plant entrance during standard business hours. ALCOSAN screening is only required of Contractor personnel getting access cards. Each Contractor will provide four names and ALCOSAN will schedule them to get the badge made with ALCOSAN (HR) See Step 1A.

c) Contractor personnel Badges will be color coded by project so that employees can be identified with the project/ area of the Plant that they are working on. The Badge will also have additional identification information such as CONTRACTOR and a number.

d) If a Contractor has more than one active project at the Plant and its personnel are pooled with more than one project in different areas of the site those personnel shall be registered for both projects obtaining more than one badge, each colored according to the area they are working in.

e) Badges shall be visibly worn by Contractor personnel at all times – including on the bus into and out of the Plant. It will be the responsibility of the Contractor superintendent to ensure that this requirement is met by all its personnel. Security may conduct spot checks for this and other compliance issues. Contractor has the option to assign a color coded badge to personnel to be kept on site and displayed daily throughout their time working on site. Security will need a copy of the assigned badge list to include the names of the personnel and badge number assigned to each individual. These badges signify the zone the employee should be working in.

f) If contractor personnel are observed not wearing a Badge by ALCOSAN they shall report it to the CM inspector or Resident Engineer. He/she will report this to the Contractor superintendent. This process is the same if the observation is made by a CM employee.

g) It will be the responsibility of the Contractor superintendent to recover identification cards of personnel who are dismissed from the Contractor's workforce. Dismissed personnel shall be escorted off the site by the Contractor superintendent. Security can assist the superintendent if there are workplace violence concerns).

END OF ATTACHMENT A

SECTION 01 71 16
MANUFACTURER ACCEPTANCE OF CONDITIONS

PART 1 GENERAL

1.01 SUMMARY OF WORK

A. This section defines manufacturer's requirements for equipment installation, start-up, testing and training.

B. Training under this section includes separate training sessions for Operations Staff and Plant Maintenance Staff which is further divided into groups. Product-specific training to be included based on Owner's input.

C. Plant Maintenance staff is divided into the following functional groups:
   1. Plant Mechanics
   2. Lubrication Mechanics
   3. Instrument Techs
   4. Electricians
   5. HVAC Techs

D. Manufacturer's training shall be structured to provide focused training to each of these functional groups. This will include development and delivery of separate training materials for each functional group.

E. Training shall be structured to accommodate training on different shift schedules.

F. Training content for each functional group shall, at a minimum, include the items listed in Section 01 75 00, Facility Startup, paragraph 3.2.C.8, and be tailored for each functional group audience. Format of Course Outline/Lesson Plan is to follow examples provided at the end of this section.

1.02 DEFINITIONS

A. Refer to the Contract Provisions, as well as Section 01 75 00, Facility Startup.

B. Person-Day:
   1. One person for eight continuous working hours regardless of time of day exclusive of travel time to and from the site.

C. Owner-Furnished Equipment Supplier:
   1. The party under separate contract with Owner to furnish identified equipment.

D. Time Periods:
   1. Those given in Technical Specifications for field services by manufacturers' representatives and each type of field service to be provided, as further described in Article 6, are approximate and may be redistributed by the Owner, at its sole discretion, to meet the needs of the work. This contract is based upon the Owner's purchasing of the amounts of time for each component of work, and the Owner shall be entitled to receive the total of the number of days listed for all field activities for any such purposes it may deem necessary or appropriate.

1.03 SUBMITTALS

A. Initial Training Plan:
   1. Submit no later than 120 calendar days before initial startup of each piece of

equipment.
2. Revise and resubmit within 7 calendar days following receipt of comments on Initial Training Plan.

B. Final Training Plan:
1. Submit no later than 60 calendar days before initial startup of each piece of equipment.

C. Quality Control Submittals: When specified in the individual Specifications, submit:
1. Manufacturer's Certificate of Proper Installation appended to this section.
2. Testing Reports: For all Shop, Acceptance and Performance Testing required by the Contract Documents and performed.

D. Resume of manufacturer's representative for Contractor-supplied equipment shall be submitted for acceptance and record.

1.04 QUALIFICATION OF MANUFACTURER'S REPRESENTATIVE

A. The manufacturer’s representative shall be an authorized representative of the equipment manufacturer, factory trained, and experienced in the technical applications, installation, operation, and maintenance of respective equipment, subsystem, or system. Representatives are subject to acceptance by Owner and Consulting Engineer. No substitute representatives will be allowed unless prior written approval by Engineer has been given.

1.05 FULFILLMENT OF SPECIFIED MINIMUM SERVICES

A. Where manufacturers' services are specified, furnish manufacturer's qualified representative.
1. Where time is taken in excess of that stated in the Specifications by manufacturers’ representative for reasons beyond the control of the Owner, additional time required to perform the specified services shall be considered incidental work.
2. Where time taken by manufacturers' representative to perform the specified services is less than that stated in the Specifications, the value of the remaining time shall be credited to the Owner.
3. Where time is taken by manufacturers' representative to perform additional services beyond the scope of that stated in the specification, the value of the surplus time shall be added to the contract by a change order.

B. Contractor will schedule and coordinate with the Construction Manager all furnished equipment manufacturer on-site services to avoid conflicting with other on-site testing or other manufacturer's on-site services.
1. Determine that all conditions necessary to require manufacturer services have been met before requesting same. Verify and coordinate with the Construction Manager.

C. Only those days of service approved by Construction Manager will be credited to fulfill the specified minimum services. Manufacturers’ representative shall document all time spent on site with the Construction Manager.

D. Unless specified otherwise, manufacturer's on-site services shall include, as a minimum:
1. Assistance during equipment installation including observation, guidance, and instruction of Contractor's assembly, erection, installation, and/or application procedures.

2. Inspection, checking, and adjustment as required for equipment to function as warranted by manufacturer and as necessary to furnish written approval of installation.
3. Revisiting the site as required to correct problems and until installation and operation are acceptable to Engineer.
4. Resolution of assembly or installation problems attributable to, or associated with, respective manufacturers' products and systems.
5. Taking the lead role in conducting respective equipment acceptance testing, performance testing, and startup activities until product acceptance by the Owner.
6. Training of Owner's personnel in the operation and maintenance of respective equipment as required herein.
7. Completion of manufacturer's Certificate of Proper Installation (form enclosed at end of this section) with applicable certificates for proper installation, testing and service.
8. Reporting to the Construction Manager any unusual circumstances that occur during installation and testing that may require additional manufacturer representative time at the jobsite which would cause the stipulated time in the contract to be exceeded.

1.06 TRAINING SCHEDULE

A. The Contractor will propose a training schedule for equipment furnished and installed under this contract by the Contractor. The Construction Manager will assist the Contractor by coordinating the scheduling of manufacturer's representative services provided by Owner-furnished equipment suppliers.

B. The Contractor's schedule will identify all equipment and systems installed under this contract that require training services of manufacturers' representatives and show:
   1. Estimated dates for installation completion.
   2. Estimated training dates to allow for multiple sessions for each functional maintenance area per Section 01 75 00, Facility Startup, paragraph 3.2.C.4.d.
   3. Actual dates for each training session will be determined by the Owner, Construction Manager, and Contractor.

C. Adjust training schedule to ensure training of appropriate personnel as deemed necessary by Owner, and to allow full participation by manufacturers' representatives. Adjust schedule for interruptions in operability of equipment.

D. Coordinate with Section 01 75 00, Facility Start-Up.

1.07 TRAINING PLAN

A. Initial Training Plan: Submit the following for each proposed course:
   1. Equipment Reference: Identify spec section, equipment type, location, model name and number, and quantity.
   2. Supporting Documentation: Confirm that all applicable O&M data has been submitted for record.
   3. Audience: Identify which Maintenance Functional Group the training is intended to cover.
   4. Overall Learning Objectives: Describe what each maintenance group should be able to do after the training.
   5. Training Time: Identify total length of training for each maintenance group.
   6. Course Outline: Provide a breakout of training by topics per Section 01 75 00, Facility Startup, paragraph 3.2.C, for start and end times, instructor, and location.
   7. Lesson Plan: Provide detailed description of lesson objectives and sub-topics, for

each topic listed in Course Outline.

B. Final Training Plan: Submit the following after the training coordination meeting with the training schedule.
   1. Updated Items 1 through 7 from above.
   2. Resumes of instructors providing training.
   3. Draft training schedule.
   4. Presentation Materials: Provide copies of all planned hand-outs, and presentation (PPT) slides.
   5. Support Needs: These include audio-visual equipment, white boards, and other equipment to be supplied by the Authority.

1.08 TRAINING COORDINATION MEETING

A. Following receipt of the Final Training Plan, a training coordination meeting will be conducted by the Construction Manager to discuss the training plan associated with the equipment being provided. The purpose of this meeting will be to:
   1. Review the final training plans of both the supplier(s) (if any) and Contractor(s).
   2. Finalize training schedule based upon Owner, Contractor(s), Supplier (if any), Engineer, and Construction Manager input on the:
      a. Status of equipment installation and readiness for testing and operation.
      b. Status of Owner personnel and facility availability for training.
      c. Status of required training, testing, and startup deliverables.
      d. Requirements of the Contract Documents for Owner personnel training, testing, and startup.
   3. Incorporate the above into the Project Schedule for testing and startup of the equipment/sub-system/system/facility.

B. The following shall have the required representatives at this meeting:
   1. Construction Manager (CM).
   2. Consulting Engineer (FDC).
   3. Owner (ALCOSAN).
   4. Program Manager (if any).
   5. Supplier (if any).
   6. Installation Contractor (and Subcontractors as appropriate).

1.09 TRAINING OWNER'S PERSONNEL

A. Furnish training personnel in accordance with Article 1.4 of this section.

B. Provide both detailed classroom and job site hands-on training to Owner's personnel on operation and maintenance of equipment per the list of items included in Section 01 75 00, Facility Startup, paragraph 3.2 C.7.

C. Pre-Startup Training:
   1. Coordinate training sessions with Owner's operating personnel and manufacturers' representatives, and with submission of operation and maintenance manuals.
   2. Complete at least 14 but not less than 30 days prior to actual startup, however functional testing must be successfully completed prior to start of any training.

D. Post-Startup Training:
   1. If required in specifications, furnish and coordinate training of Owner's operating personnel by respective manufacturer's representatives.

1.10 SUPPLEMENTS

A. The supplements listed below, following the end of this section, are part of this specification:
   1. Forms: Manufacturer's Certificate of Proper Installation.
   2. Table: Manufacturer's On-Site Services for Facility Start-Up
   3. Appendix A: Course Outline/Lesson Plan Example

PART 2 PRODUCTS - (NOT USED)

PART 3 EXECUTION

3.01 MANUFACTURER REPRESENTATIVE FIELD INSPECTIONS

A. This applies to Contractor furnished Equipment and Owner-furnished equipment. If so, specified in the Contract Documents.

B. The purpose of the manufacturer representative's field inspections is to assure the Work has been constructed and/or installed in accordance with the Contract Documents including the design Drawings, Specifications, and any manufacturer's recommendations. The Contractor shall coordinate all inspections through the Construction Manager.

C. The manufacturers' representative shall exercise particular care to verify all component interconnecting facilities and such other Items of a critical nature to the proper and safe operation of the Work are in place, protected or otherwise ready for start-up and initial operations.

D. The manufacturers' representative's inspections shall include, but will not be limited to, the following points as applicable: soundness of construction and/or installed equipment, if any (without cracked or otherwise damaged parts); completeness in all details, as specified; correctness of setting, alignment and relative arrangement of various parts; adequacy and correctness of all interface connections, utilities and necessary support facilities.

E. All defective or deficient construction, materials, components or workmanship disclosed through these inspections and tests shall be repaired, replaced or corrected immediately under the supervision of the manufacturer's representative, or provisions shall be made by the Contractor for their prompt repair, replacement or correction. The remedial work shall be done at the expense of the responsible party as determined by the Owner.

F. No electrical power shall be turned on to any of the work until the manufacturer's representative has inspected the construction and/or installed items and certified that the construction and/or installation is satisfactory; that the electrical power may be applied; and that nothing in the construction and/or installation shall negate any warranty which covers any portion of the work, and the manufacturer representative has submitted a signed writing verifying the above.

(continued)

MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

PROJECT: _____ EQPT. SERIAL NO.: _____

CONTRACT NO.:_____ EQPT/SYSTEM: _____

EQUIPMENT NO.:_____ SPEC. SECTION: _____

I hereby certify that the above-referenced equipment/system has been (check applicable):

- □ Installed in accordance with manufacturer's recommendations and approved shop drawings.
- □ Inspected, checked, and adjusted.
- □ Serviced with proper initial lubricants.
- □ Electrical and mechanical connections meet required quality and safety standards.
- □ All applicable safety equipment has been properly installed.
- □ Acceptance and performance tested and meets or exceeds specified performance requirements.

Comments:

_____

I, the undersigned Manufacturer's Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate his equipment and (iii) authorized to make recommendations required to assure that the equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

Date: _____, 202_____

Manufacturer:_____

By Manufacturer's Authorized Representative

_____

(Authorized Signature)

(See attached testing report.)

SECTION 01 71 16 – MANUFACTURERS' ON-SITE SERVICES FOR FACILITY START-UP

Add No. 9

Spec. No.	Technical Specification Equipment Description	Special Requirements	Minimum Number of Trips	Minimum Time in Person-Days			Training	
				Assistance during Installation and Inspection	Acceptance / Performance Testing and Certification of Proper Installation	Facility Startup	Sessions	Total Training Hours
08 31 00	Access Doors and Panels	-	1	1 day	-	-	-	-
08 31 20	Floor Access Doors	-	1	-	-	1 day	-	-
08 33 23	Overhead Coiling Doors	Installation shall be done by the manufacturer's authorized representative	6	3 days	2 days	1 day	-	-
08 51 13	Aluminum Windows	-	2	2 days			-	-
14 21 23.16	MRL Traction Passenger Elevators	-	3	1 day	1 day	1 day	5	8
21 13 13	Wet-Pipe Sprinkler Systems	-	-		-	-	-	-
22 14 29	Sump Pumps	-	-		-	-	-	-

Spec. No.	Technical Specification Equipment Description	Special Requirements	Minimum Number of Trips	Minimum Time in Person-Days			Training	
				Assistance during Installation and Inspection	Acceptance / Performance Testing and Certification of Proper Installation	Facility Startup	Sessions	Total Training Hours
23 31 16	FRP Ductwork	-	1	1 day	-	-	-	-
23 33 00	Electric Domestic Water Heaters	-	-		-	-	-	-
23 09 23	Direct Digital Control Systems	-	2		1 day	1 day	1	2
23 34 23	HVAC Power Ventilators	Manufacturer's trained service technician	2		1 day	1 day	1	2
23 73 13	Packaged Rooftop Units	Manufacturer's trained service technician	2	-	1 day	1 day	1	2
23 73 43	Rooftop 100% Outside Air Units	Manufacturer's trained service technician	2	-	1 day	1 day	1	2
23 81 26	Ductless Split System Air Conditioners	-	2		1/2 day	1/2 day	1	2
23 82 39	Unit Heaters	-	2		1/2 day	1/2 day	1	2
26 12 16	Dry Type Medium Voltage Transformers	Combine training for Sections 26 12 16, Section 26 13 23, 26 18 23 and Section 26 18 43. Total hours of training however shall not be combined.	2		1 day	1 day	2	2

Spec. No.	Technical Specification Equipment Description	Special Requirements	Minimum Number of Trips	Minimum Time in Person-Days			Training	
				Assistance during Installation and Inspection	Acceptance / Performance Testing and Certification of Proper Installation	Facility Startup	Sessions	Total Training Hours
26 13 23	Medium Voltage Metal Enclosed Switchgear	See requirements for Section 26 12 16.	3	1 day	1 day	2 days	2	2
26 18 23	Medium Voltage Surge Arrestors	See requirements for Section 26 12 16.	2	-	1 day	1 day	2	2
26 18 43	Medium Voltage Variable Frequency Motor Controllers	See requirements for Section 26 12 16.	7	2 days	3 days	3 days	2	8
26 22 00	Low Voltage Transformers	-	2		1 day	1 day	-	-
26 24 13	Switchboards	-	2		1 day	1 day	-	-
26 24 16	Panelboards	-	2		1 day	1 day	-	-
26 24 19	Motor Control Centers	-	4	1 day	1 day	1 day	2	2
26 29 23	Variable Frequency Motor Controllers	-	3	1 day	1 day	1 day	2	8
26 33 53	Static Uninterruptable Power Supply	-	2		1 day	2 days	2	2
26 36 13	Automatic Transfer Switch	-	2		1 day	1 day	2	2

Spec. No.	Technical Specification Equipment Description	Special Requirements	Minimum Number of Trips	Minimum Time in Person-Days			Training	
				Assistance during Installation and Inspection	Acceptance / Performance Testing and Certification of Proper Installation	Facility Startup	Sessions	Total Training Hours
28 46 00	Fire Detection and Alarm		3	1 day	1 day	1 day	3	6
33 05 46 and 40 05 02.05	Piping System Schedules - Pressurized Wastewater and Drainage	As it applies to Prestressed Concrete Cylinder Pipe installation	3	1 day	1 day	1 day	-	-
40 05 57.23	Electric Motor Actuators		3	1 day	1 day	1 day	4	8
40 05 59.23	Fabricated Slide Gates		3	1 day	1 day	1 day	4	8
40 05 59.24	Fabricated Bulkhead Gates		3	2 days	2 days	1 day	4	8
40 05 61.43	Knife Gate Valves		3	1 day	1 day	1 day	4	8
40 05 67	Rotary Cone Valves		3	1 day	1 day	3 days	4	8
40 66 10	Network and Communication Equipment		3	1 day	1 day	1 day	2	4
40 68 00	Distributed Control System (DCS)		3	1 day	1 day	3 days	2	8
40 71 00	Flow Measurement		3	1 day	1 day	3 days	2	2

Spec. No.	Technical Specification Equipment Description	Special Requirements	Minimum Number of Trips	Minimum Time in Person-Days			Training	
				Assistance during Installation and Inspection	Acceptance / Performance Testing and Certification of Proper Installation	Facility Startup	Sessions	Total Training Hours
40 72 00	Level Measurement		3	1 day	1 day	1 day	2	2
40 73 00	Pressure Instrumentation		3	1 day	1 day	1 day	2	2
40 76 00	Primary Meters and Transmitters		3	1 day	1 day	3 days	2	2
41 22 00	Bridge Cranes and Hoists	Preferred that all Div 41 equipment training occur on same day	4	2 days	1 day	2 days	4	8
41 22 13.13	Radial Bridge Cranes and Hoists	Preferred that all Div 41 equipment training occur on same day	4	2 days	1 day	2 days	4	8
41 22 13.19	Jib Crane	Preferred that all Div 41 equipment training occur on same day	2	-	1 day	1 day	4	8
41 22 23.19	Monorail Hoist	Preferred that all Div 41 equipment training occur on same day	2	1 day	1 day	1 day	4	8
43 05 22	Medium Voltage Motors	Refer to Section 43 23 16 requirements.	-	-	-	-	-	-
43 11 19.13	Centrifugal FRP Fans		3	2 days	2 days	2 days	4	8
43 23 16	Custom Engineered Vertical Non-	Training sessions to be integrated with motor	7	6 days	12 days	6 days	8	14

Spec. No.	Technical Specification Equipment Description	Special Requirements	Minimum Number of Trips	Minimum Time in Person-Days			Training	
				Assistance during Installation and Inspection	Acceptance / Performance Testing and Certification of Proper Installation	Facility Startup	Sessions	Total Training Hours
	Clog Variable Speed Pumps	training on back to back days.						
43 23 80.13	Submersible Wastewater Pumps - Constant Speed		2	-	1 day	1 day	4	4
43 23 80.15	Submersible Wastewater Pumps -Variable Speed		3	1 day	1 day	1 day	4	4
43 41 45.16	FRP Tanks for Activated Carbon	Combine training among Section 43 41 45.16, Section 44 31 16 Activated Carbon Odor Control Media and Section 44 31 14.	4	1 day	3 days	2 days	4	8
44 31 14	Prefilters	Refer to Section 43 41 45.16 requirements.	1	1 day	-	-	4	8
46 61 73	Automatic Screen Filter	Refer to Section 46 61 73 requirements.	3	1 day	2 days	1 day	4	8

Note: Number of trips refer to separate, non-consecutive visits to the Owner's plant site.

END OF SECTION

SECTION 01 75 00
FACILITY START-UP

PART 1 GENERAL

1.01 GENERAL

A. The exact sequence of the facility start-up, if any, will depend upon a Start-up Schedule to be developed by the Construction Manager with ALCOSAN, Engineer, and the Contractors. The Startup Schedule will be based on a prioritized list of the equipment and systems which are critical and required for start-up, to be determined by the ALCOSAN and the Project Schedule, as well as any relevant information provided to the Construction Manager by the Contractors. The Start-up Schedule will be updated on a periodic basis as determined by the Construction Manager.

B. It is the Contractor's responsibility to make sure that all Work is completed in time to support Facility Start-up and it is the Contractor's further duty to notify the Construction Manager when the work is ready to begin Start-up. Initial operation and testing may begin only after the Owner receives written certification of the complete and correct installation of the Work.

C. All equipment testing, and operation will be witnessed by the Owner, Engineer and/or Construction Manager and shall be performed as required so as to prove that the Work has been constructed and/or installed properly and will operate satisfactorily under the specified conditions of service. No power is to be turned on to any piece of equipment and no equipment is to be started or tested by the Contractor or Manufacturer's representative without the presence of the Owner or Construction Manager unless the Owner directs otherwise.

D. The Contractor must verify the integrity of the Work and make any adjustments; calibrations and/or remedial measures required to prepare the Work for Acceptance and Performance Testing.

E. Section Includes:
   1. Procedures and actions, required of the Contractor, which are necessary to achieve and demonstrate Substantial Completion.
   2. Requirements for Substantial Completion Submittals.

F. Related Sections include but are not necessarily limited to:
   1. Volume One - General Contract Conditions.
   2. Division 01 - General Requirements.
   3. Technical Specifications.

1.02 DEFINITIONS

A. Acceptance Test:
   1. A specified test or series of tests performed by the Installation Contractor in the presence of the Engineer and Construction Manager. Sometimes referred to as functional testing in the technical specifications. Acceptance testing shall be performed:
      a. After performing a physical checkout of the equipment/system by the manufacturer's representative and after the acceptance of a Certificate of Proper Installation is received by the Construction Manager.

b. For the express purpose of proving that the equipment/system operates as intended with operational checks such as rotation, vibration, temperature, amperage draw, functioning instrumentation and controls, alignment, noise, etc.
c. Perform successfully prior to Performance Testing.
d. By the manufacturer's representative who will take the lead on testing Contractor supplied equipment or by the equipment manufacturer's representative who will take the lead on testing Owner-furnished equipment. The Construction Manager will identify interfaces for testing responsibilities.

B. Operation Period:
1. The operation period begins when the facility has been successfully started up as defined under Start-Up Period and the Final Acceptance requirements of the Contract have been met.

C. Project Process System (System, system, PPS):
1. A defined part of the Project, consisting of an arrangement of items, such as equipment, structures, components, piping, wiring, materials, or incidentals, so related or connected to form an identifiable, unified, functional, operational, safe, and independent system.

D. Physical Checkout:
1. The process of verifying that the equipment/system has been installed, adjusted and readied for operation in accordance with the contract and with the manufacturer's recommendations. The proper installation shall be certified by the equipment manufacturer's representative responsible for the equipment. The Manufacturer's Representative will complete and submit to the Construction Manager a Certificate of Proper Installation.

E. Performance Test:
1. A specified test or series of tests performed by the Installation Contractor in the presence of the Engineer, Construction Manager, and Owner. The performance test will be conducted after the specified acceptance testing to demonstrate and confirm that the equipment and/or system meets the specified performance requirements. The performance test will:
a. Demonstrate that the equipment/system meets the functional, technical and/or process design criteria in the contract documents.
b. Be conducted prior to the Start-Up Period and acceptance by the Owner.
c. Be conducted by the Manufacturer's Representative who will take the lead on testing Contractor supplied equipment or by the equipment manufacturer's representative who will take the lead on testing Owner furnished equipment.

F. Substantial Completion:
1. See Volume One, General Contract Conditions.

G. Start-Up Period:
1. The efforts after successful Acceptance and Performance Testing, including the process of putting the facility in operating order, final cleaning, adjusting, and balancing the equipment, initial operation (start-up) of the equipment, operating the equipment and systems, and demonstrating and verifying the successful operations of the completed facility as a unit.

2. Demonstrate proper installation, adjustment, function, performance, and operation of equipment, systems, control devices, and required interfaces individually and in conjunction with process instrumentation and control system.
3. Unless otherwise specified, start-up of the entire facility or any portion thereof shall be considered complete when, in the opinion of the Engineer, the facility or a designated portion thereof has operated in the manner intended for five days of continuous operation without interruption. This period is in addition to any acceptance or performance test periods specified elsewhere. A significant interruption will require the startup, then in progress, to be stopped and restarted after corrections are made.
4. Start-up period shall include all inspection, testing, finishing of handrailing, acceptance of operation and maintenance manuals, training, and applicable restoration to the work area, prior to turning facilities over to the Owner

H. Significant Interruption of Start-Up may include, but are not necessarily limited to, any of the following events:
1. Failure of Contractor to maintain qualified on-site startup personnel as scheduled.
2. Failure to meet specified performance criteria for more than two consecutive hours.
3. Failure of any critical equipment unit, system, or subsystem that is not satisfactorily corrected within five hours after failure.
4. Failure of noncritical unit, system, or subsystem that is not satisfactorily corrected within eight hours after failure; and/or,
5. As may be determined by Engineer.

1.03 SUBMITTALS

A. See Section 01 33 00, Submittals, for requirements for the mechanics and administration of the submittal process.

B. Administrative Submittals:
1. Training: See Section 01 71 16, Manufacturer Acceptance of Conditions.
2. Acceptance and performance test schedules and plan for equipment, units, and systems at least 28 days prior to start of related testing. Include test plans, procedures, and data collection forms.
3. Schedule and plan of facility startup activities at least 28 days prior to commencement.

C. Quality Control Submittals:
1. Manufacturer's Certificate of Proper Installation
2. Physical Checkout, Acceptance and Performance Test Documentation:
a. Presented in a format appropriate for the equipment and for the tests being performed and approved by the Engineer.
b. Data recorded/results acceptable to Engineer.
c. Submitted for each piece of equipment or system tested.

D. O&M Data:
1. See Section 01 52 00, Maintenance of Plant Operations.

E. Certification of Calibration of All Testing Equipment:
1. Calibration must be demonstrated to the Construction Manager to be within the previous 12-month period.

1.04 RESPONSIBILITIES

A. Owner Startup Responsibilities:
   1. Successfully operate process units and devices, with support of Contractor.
   2. Provide sampling, labor, and materials as required and provide laboratory analyses.
   3. Make available spare parts and special tools and operation and maintenance information for Owner-furnished equipment.
   4. Provide water, power, chemicals, and other items as required for testing, unless otherwise specified.
   5. Approve Contractor plans, schedules, materials, test data, etc. for facility start-up process.

B. Construction Manager Startup Responsibilities:
   1. Conduct Pre-Test/Startup Meetings.
   2. Coordinate development of the testing and start-up schedule with Contractor(s) based on information provided by the Installation Contractor and Owner.
   3. Coordinate review with Owner and Engineer of the Installation Contractor's testing and start-up plans and schedules for each piece of equipment and/or system.
   4. Witness and document physical checkout, acceptance and/or performance test.
   5. Coordinate plant operations, if necessary, to facilitate Contractor's tests.
   6. Verify submittal of all required deliverables by Contractor.
   7. Schedule Manufacturer's Representative(s) for Owner furnished equipment.
   8. Document Contractor's completion of start-up requirements.

C. Installation Contractor Startup Responsibilities:
   1. See this Section, Division One, and the Technical Specifications.

1.05 PRE-TEST/START-UP COORDINATION MEETING

A. A pre-test/startup coordination meeting will be conducted by the Construction Manager to discuss the overall testing and startup program associated with the equipment being provided under this contract. The Construction Manager will notify the Contractor, Owner, Engineer and Manufacturer Representative of the time and place of the meeting. The purpose of this meeting will be to:
   1. Review the testing and startup requirements of both the Contractor(s) and Manufacturer Representative.
   2. Develop a testing and startup schedule based upon input from the Owner, Contractor(s), Manufacturer Representative, Engineer, and Construction Manager on the:
      a. Progress of equipment installation and readiness for checkout, testing and operation.
      b. Status of required testing and startup deliverables.
      c. Requirements of the Contract Documents for testing and startup involvement.
   3. Incorporate the above into the Test and Start-Up Schedule for testing and startup of the equipment/sub-system/system/facility.

B. The following persons (or their designated representatives) are required to attend this meeting:
   1. Contractors & Subcontractors
   2. Construction Manager (CM).
   3. Engineer (FDC).
   4. Owner (ALCOSAN).
   5. Manufacturer Representative(s).
   6. Testing Agency/Firm.

1.06 COST OF START-UP

A. Contractor to pay all costs associated with facility start-up.

PART 2 PRODUCTS - (NOT USED)

PART 3 EXECUTION

3.01 PHYSICAL CHECK-OUT

A. Completion of Construction Work:
   1. Complete the work to bring the PPS to a state of Substantial Completion.

B. Equipment Start-up:
   1. Requirements for individual items of equipment are included in the Technical Specification Sections.
   2. Prepare the equipment so it will operate properly and safely and be ready to demonstrate functional integrity during the Demonstration Period.
   3. Perform Equipment Start-up to extent possible without introducing product flow.
   4. Procedures include but are not necessarily limited to the following:
      a. Test or check and correct deficiencies of:
         1) Power, control, and monitoring circuits for continuity prior to connection to power source.
         2) Voltage of all circuits.
         3) Phase sequence.
         4) Cleanliness of connecting piping systems.
         5) Alignment of connected machinery.
         6) Vacuum and pressure of all closed systems.
         7) Lubrication.
         8) Valve orientation and position status for manual operating mode.
         9) Tankage for integrity ~~using clean water~~.
         10) Pumping equipment ~~using clean water~~.
         11) Instrumentation and control signal generation, transmission, reception, and response.
            a) See Section 40 61 13, Process Control Systems General Requirements.
         12) Tagging and identification systems.
         13) All Equipment: Proper connections, alignment, calibration, and adjustment.
      b. Calibrate all safety equipment.
      c. Manually rotate or move moving parts to assure freedom of movement.
      d. "Bump" start electric motors to verify proper rotation.
      e. Perform other tests, checks, and activities required to make the equipment ready for Demonstration Period.
      f. Dry Testing: Perform dry testing for each piece of equipment.
         1) Any malfunctions appearing during the tests shall be corrected by replacement of defective and adjustment of maladjusted parts or equipment. Additional testing shall be performed, as directed by the Engineer, to assure that the replaced or readjusted equipment will perform satisfactorily.
         2) All instruments and controls shall be calibrated and checked for accuracy and any further adjustments made.

ADD NO. 9

ADD NO. 9

3) All control systems shall be run and checked for operation as specified and any corrective action taken.

g. Wet Testing: Refer to Part 3.04 Acceptance Testing.

h. Documentation:

1) Prepare a log showing each equipment item subject to this paragraph and listing what is to be accomplished during equipment start-up.

2) Provide a place for the Contractor to record date and person accomplishing required work.

3) Submit completed document before requesting inspection for Substantial Completion certification.

5. Obtain certifications, without restrictions or qualifications, and deliver to Engineer:

a. Manufacturer's Field Services Report

b. Instrumentation Supplier's Instrumentation Installation Certificate.

3.02 PERSONNEL TRAINING:

A. See individual equipment specification sections and Section 01 71 16, Manufacturer Acceptance of Conditions, Article 1.7.

B. Conduct all personnel training after completion of equipment start-up for the equipment for which training is being conducted.

1. Personnel training on individual equipment or systems will not be considered completed unless:

a. All pertaining deliverables are received and approved before commencement of training on the individual equipment or system.

b. All Operation and Maintenance (O&M) manuals, and detailed process and controls training materials have been distributed to the Operations and Maintenance staff prior to the start of training.

c. No system malfunctions occur during training.

d. All provisions of field and classroom training specifications are met.

2. Training not in compliance with the above will be performed again in its entirety by the manufacturer at no additional cost to Owner.

3. Supplemental process and control overview training will be provided by Owner's Program Manager along with related Field Reference Manual and Distributed Controls System (DCS) Reference Manuals. All native files associated with related training material prepared by Contractor and their Manufacturers shall be provided to Owner.

C. Field and Classroom Training Requirements:

1. All training to be held on site.

2. Notify each manufacturer that the Owner reserves the right to video record any or all training sessions for each equipment.

3. Training Instructor Qualification: Factory trained and experienced in both classroom and "hands-on" training delivery.

4. Training Instructors:

a. Be at classes on time.

b. Session beginning and ending times to be coordinated with the Owner and indicated on the master schedule.

c. Normal time lengths for class periods can vary, but brief rest breaks should be scheduled and taken.

d. Organize training sessions into maintenance functional areas and identify on schedule. Maintenance functional areas include:
    1) Plant Mechanics
    2) Lubrication Mechanics
    3) Instrument Techs
    4) Electricians
    5) HVAC Techs

5. Plan for maximum class attendance of 10 people at each session and provide sufficient classroom materials, samples, and handouts for those in attendance.
6. Instructors to have a typed agenda and well-prepared instructional material.
    a. The use of visual aids, e.g., videos, photos, and presentation slides are required for use during the classroom training programs.
    b. Deliver agendas to the Engineer a minimum of seven days prior to the classroom training.
    c. Provide equipment required for presentation of videos, photos, and other visual aids.
7. In the on-site training sessions, cover the information required in the operation and maintenance manuals submitted according to Section 01 33 04, Operation and Maintenance Manuals, and the following areas as applicable to PPS's.
    a. Local operation of equipment
    b. Lubrication of equipment.
    c. Repair of equipment.
    d. Troubleshooting of equipment.
    e. Preventive maintenance procedures.
    f. Adjustments to equipment.
    g. Inventory of spare parts.
    h. Operational safety.
    i. Takedown procedures (disassembly and assembly.)
    j. Inspections
    k. Installation/removal
    l. VFD control
8. Maintain a log of classroom training provided including Instructors, topics, dates, time, and attendance.

D. Complete the filing of all required submittals:
1. Shop Drawings.
2. Operation and Maintenance Manuals.
3. Training material.

E. Filing of Contractor's Notice of Substantial Completion and Request for Inspection of Project or PPS:
1. File the notice when the following have been completed:
    a. Construction work (brought to state of Substantial Completion).
    b. Equipment Start-up.
    c. Personnel Training.
    d. Submittal of required documents.
2. Engineer and Construction Manager will review required submittals for completeness within five calendar days of Contractor's notice. If complete, Engineer and Construction Manager will complete inspection of the Work, within five calendar days of Contractor's notice.

3. Construction Manager will inform Contractor in writing of the status of the Work reviewed, within five calendar days of Contractor's notice.
    a. Work determined not meeting state of Substantial Completion:
        1) Contractor: Correct deficiencies noted or submit plan of action for correction within five days of Engineer's determination.
        2) Engineer and Construction Manager: Reinspect work within five days of Contractor's notice of correction of deficiencies.
        3) Inspection costs after the first reinspection incurred by Engineer and Construction Manager will be billed by the Owner who will deduct them from final payment due Contractor.
    b. Work determined to be in state of tentative Substantial Completion: Construction Manager may prepare a “Tentative Certificate of Substantial Completion."
    c. Certificate of Substantial Completion:
        1) Certificate issued subject to successful Demonstration of functional integrity.
        2) Issued for Project as a whole or for one or more PPS.
        3) Issued subject to completion or correction of items cited in the certificate (punch list).
        4) Issued with responsibilities of Owner and Contractor cited.
        5) Prepared by Construction Manager.
        6) Signed by Engineer
        7) Accepted by Owner.
        8) Accepted by Contractor.
    d. Upon successful completion of Demonstration Period, Engineer will endorse certificate attesting to the successful demonstration, and citing the hour and date of ending the successful Demonstration Period of functional integrity as the effective date of Substantial Completion.
    e. Warranty of materials and equipment in use begins on the effective date of Substantial Completion.

3.03 TESTING PREPARATION

A. The Contractor must verify the integrity of the Work and make any adjustments; calibrations and/or remedial measures required to prepare the Work for Acceptance and Performance Testing.

ADD NO. 9

B. All equipment testing, and operation may be witnessed by the Owner and shall be performed as required so as to prove that the Work has been constructed and/or installed properly and will operate satisfactorily under the specified conditions of service. No power is to be turned on to any piece of equipment and no equipment is to be started or tested by the Contractor or Manufacturer’s representative without the presence of the Owner or Owner’s Representative unless the Owner directs otherwise.

C. General:
    1. Complete the Work, including related manufacturer's representative services, associated with the unit and related processes before testing.
    2. Furnish related operating and maintenance manuals and have the necessary spare parts and special tools available before testing any unit or system.
    3. A qualified manufacturer's representative(s) must be present to take the lead in the testing.
    4. Utilize the Manufacturer's Certificate of Proper Installation Form from Section 01 71 16, Manufacturer Acceptance of Conditions, supplemented as necessary and as

required in the General Contract Conditions, to document the acceptance and performance test procedures, results, problems, and conclusions.

5. Schedule and attend the pretest (Acceptance and Performance) meetings as necessary to determine the Startup Schedule, test plan, materials, chemicals, and liquids required, facilities' operations interface, Owner's, Engineer's, Manufacturer Representative, and Construction Manager's involvement.
6. Designate and furnish one or more persons to be responsible for coordinating and expediting the Contractor's facility startup duties. This person or persons shall be present during facility startup meetings and shall be available at all times during the facility startup period.
7. Provide whatever temporary piping, bulkheads, valves, gauges test equipment, water, chemicals, fuel and other materials and equipment are needed to conduct the testing.
8. Provide all labor required to aid the manufacturer's representative(s) with their inspection and in making required adjustments to all equipment installed under this contract.

D. Cleaning and checking prior to starting acceptance and performance testing:
   1. Calibrate testing equipment per manufacturer's recommendations to ensure accurate test results.
   2. Inspect and clean equipment, devices, connected piping, and structures so that they are free of foreign material.
   3. Lubricate equipment in accordance with manufacturer's instructions.
   4. Turn rotating equipment by hand and check motor-driven equipment for correct rotation.
   5. Open and close valves by hand and operate other devices to check for binding, interference, or improper functioning.
   6. Check power supply to electric-powered equipment for correct voltage.
   7. Adjust clearances and torques.
   8. Test piping for leaks.
   9. Obtain completion of applicable portions of Manufacturer's Certificate of Proper Installation in accordance with Section 01 71 16, Manufacturer Acceptance of Conditions.

E. "Ready-to-test" will be determined by the Construction Manager based at least on the following:
   1. Notification by Contractor(s) of equipment and system readiness for testing.
   2. Acceptable testing plan.
   3. Acceptable operation and maintenance manuals incorporating review comments.
   4. Receipt of Manufacturer's Certificate of Proper Installation, if specified.
   5. Adequate completion of Work adjacent to, or interfacing with, equipment to be tested, including items to be furnished by Owner.
   6. Availability and acceptability of manufacturer's representative, when specified, to assist in testing of respective equipment, and satisfactory fulfillment of other specified manufacturers' responsibilities.
   7. Equipment and electrical tagging completed.
   8. Necessary spare parts and special tools on hand.
   9. Confirmation that all applicable loop checks and instrument calibrations have been completed and the appropriate Loop Check-out and Instrument /Final Control Element Certification sheets are filled out.

10. Confirmation from the Owner, Construction Manager and Engineer that the WWPS Distributed Control System (DCS) and network hardware is configured, programmed and ready for testing.

3.04 ACCEPTANCE TESTING

A. General:

1. Wet Testing: Provide wet testing for each piece of equipment. Each wet test shall include the following: ADD NO. 9
   a. Any malfunctions appearing during the tests shall be corrected by replacement of defective and adjustment of maladjusted parts or equipment. Additional testing shall be performed, as directed by the Engineer, to assure that the replaced or readjusted equipment will perform satisfactorily.
   b. All instruments and controls shall be calibrated and checked for accuracy and any further adjustments made.
   c. All control systems shall be run and checked for operation as specified and any corrective action taken.
2. Begin testing at a time mutually agreed upon by the Owner, Construction Manager, Engineer, manufacturer's representative(s), and Contractors.
3. Notify, in writing, the Owner, Engineer, Construction Manager, and manufacturer's representative at least 10 days prior to the scheduled date of tests.
4. Items of equipment demonstrated to function properly during subsystem testing may require no further acceptance test if documentation of subsystem testing is acceptable to Engineer.
5. Conduct test until each individual component item or system has achieved eight continuous hours of satisfactory operation. Demonstrate all operational features and controls function during this period while in automatic modes, if applicable.
6. If, in the Engineer's opinion, each system meets the functional requirements specified, the system will be accepted as conforming to the test requirements for purposes of advancing to performance testing phase. If, in Engineer's opinion, acceptance test results do not meet requirements specified, the systems will be considered as nonconforming.
7. Performance testing shall not commence until the equipment or system meets the acceptance test conditions specified.

B. The following systems are grouped by functional area for Acceptance Testing: ADD NO. 9

1. Wet Weather Pumping Systems 1 through 6 (430-I-02, 430-I-03), including:
   a. Wet weather pumps and motors (PWW00X-430, PWW00X-430MO, where X=1 to 6).
   b. Suction and discharge piping.
   c. Wet well level transmitters (P430PWW000A and P430PWW000B)
   d. Suction and discharge pressure transmitters (P430PWW00XA and P430PWW00XB, where X=1 to 6)
   e. Discharge Chamber Isolation Slide Gate (GW0001-430).
   f. Discharge Chamber Level Instrument (L430PWW000).
   g. Pump Suction Isolation Valves (PWW00X-430IV, where X=1 to 6).
   h. Pump Siphon Control Valve (PWW00X-430CV, where X=1 to 6).
   i. Pump Discharge Control Rotary Cone Valve (PWW00X-430RCV, where X=1 to 6).
   j. Plant (EWH) and Seal Water System (Refer to paragraph 3.04-B-4).
2. Emergency Flood Pump System (430-I-04), including:
   a. Emergency Flood Pumps (PED001-430, PED002-430).

b. All associated in-line valves and discharge piping.
c. All associated float switches (L430PED000X, where X=B to E)
d. Sump level transmitter (L430PED000A).

3. Sump Pump System (430-I-05), including:
   a. Sump Pumps (PBP001-430, PBP002-430)
   b. All associated in-line valves and discharge piping.
   c. All associated float switches (L430PBP000X, where X=A to E)
4. WWPS EWH and Seal Water System (430-I-06), including:
   a. Automatic Screen Filter (SEF001-430), including ancillary valves and equipment required for operation.
   b. Seal water equipment, as shown in Detail 7 on Drawing 430-MD-07.
   c. Washdown Snorkel Monitors (WSM001-430, WSM002-430).
   d. Pressure transmitters (P430NPW000, P430EWH000B).
   e. All associated in-line valves, piping and ancillary equipment.
5. Odor Control System (430-I-07)
   a. All odor control ductwork.
   b. Dampers (DAM0XX-430, where XX=01 to 20)
   c. Prefilters (MSE001-430, MSE002-430), flow switches (F430MSE001A, F430MSE002A), and differential pressure transmitters (P430MSE001B, P430MSE002B).
   d. Odor Control Fans and (FOC001-430, FOC002-430) motors (FOC001-430MO, FOC002-430MO).
   e. Carbon Scrubber (TGS001-430) and differential pressure transmitters (P430TSG001C, P430TSG001D).

3.05 PERFORMANCE TESTING

A. Begin testing at time mutually agreed upon by the Owner, Construction Manager, Engineer, manufacturers' representative(s), and Contractors, as appropriate.
   1. Engineer, Manufacturer Representative, Construction Manager, and Owner representative will be present during test.
   2. Notify Engineer and Construction Manager at least 14 calendar days prior to scheduled date of test.
   3. Follow approved test plan and detailed procedures specified.
   4. Source and type of fluid, gas, or solid for testing shall be as specified.
   5. Unless otherwise indicated, furnish all labor, materials, and supplies for conducting the test and performance measurements.
   6. Prepare performance test report summarizing test method and results. Include test logs, pertinent calculations, and certification of performance.

3.06 FACILITY STARTUP PERIOD

ADD NO. 9

A. The exact sequence of the facility start-up, if any, will depend upon a start-up schedule to be developed by the Construction Manager. The startup schedule will be based upon a prioritized list of the equipment and systems which are critical and required for start-up, to be determined by the Consulting Engineer and the Project Schedule, as well as any relevant information provided to the Construction Manager by the Contractors. The start-up schedule will be updated on a periodic basis as determined by the Construction Manager.

B. Prior to Facility Startup, submit test reports from the Acceptance and Performance Testing phases. Certify in writing that:

1. Necessary hydraulic structures, piping systems, and valves have been successfully tested.
2. Equipment systems and subsystems have been checked for proper installation, started, and successfully tested to indicate that they are operational.
3. Systems and subsystems are capable of performing their intended functions.
4. Facilities are ready for intended operation.

C. Attend Pre-Test/Startup Meeting and arrange for attendance of major equipment manufacturer representatives as required by the Contract Documents.

D. Designate and furnish one or more persons to be entirely responsible for coordinating and expediting Contractor's facility startup duties.

E. When facility startup has commenced, schedule remaining Work so as not to interfere with or delay the completion of facility startup. Support the facility startup activities with adequate staff to prevent delays and process upsets. This staff shall include, but not be limited to, major equipment and system manufacturers' representatives, Subcontractors, electricians, instrumentation personnel, millwrights, pipefitters, and plumbers.

F. Supply and coordinate specified manufacturer's facility startup services.

G. Make adjustments, repairs, and corrections necessary to complete facility startup.

H. After the facility is operating, complete the testing of those items of equipment, systems, and subsystems which could not be or were not adequately or successfully tested prior to startup test period.

3.07 BENEFICIAL OCCUPANCY

A. After successful performance testing of a particular equipment type or system, Owner may elect to start up a portion of the equipment or system for continuous operation. Such operation will not interfere with testing of other equipment and systems that may still be underway and shall not preclude the need to startup that portion operated in combination with the rest of the facility when testing is completed.
   1. Owner may request in writing to use any such part of the Work which Owner believes to be ready for its intended use. If Contractor agrees that such part of the Work is ready for Beneficial Occupancy, Contractor will request Consulting Engineer to issue a Beneficial Occupancy certificate for that part of the Work.
   2. No occupancy or separate operation of part of the Work will be accomplished prior to insurers providing property insurance have been notified and acknowledged occupancy. Insurance provisions may be amended, but the insurance cannot be canceled because of Owner occupancy.

3.08 SUBSTANTIAL COMPLETION

A. In accordance with the requirements of the General Contract Conditions, Article 3.

3.09 FINAL ACCEPTANCE

A. In accordance with the requirements of the General Contract Conditions, Article 3.

3.010 CONTINUOUS OPERATION

A. Owner will accept equipment and systems as substantially complete and ready for continuous operation only after successful facility startup is completed and documented and reports submitted, all required spare parts and special tools are turned over by the

Contractor, and manufacturers' services completed. Refer to General Contract Conditions as well as Section 01 61 03, Basic Equipment Requirements.

B. It is the Contractor's responsibility to make sure that all Work is completed in time to support facility start-up and it is the Contractor's further duty to notify the Construction Manager when the work is ready to begin start-up. Initial operation and testing may begin only after the Owner receives written certification of the complete and correct installation of the Work and that the electrical power has been provided.

ADD NO. 9

Table 01 75 00 – A
Startup and Testing Schedule [1]

Tests	Testing Descriptions	Approximate Test Duration (Working Days)	Key External Constraints[1]
Factory Testing	Factory tests of equipment as defined within the specifications and witnessing of factory tests when specified prior to shipment.	Varies by equipment	None
Physical Checkout	Consists of field verification that equipment is properly installed, including component checkout as described in Section 01 75 00. Field testing in this phase is limited to the "dry" condition (e.g. bump testing).	Varies by equipment	None
Acceptance (Functional) Testing	Occurs after Physical Checkout of all components in a process system are complete, and manufacturers of equipment in a system have certified that the equipment is properly installed. Tests demonstrate that a system of equipment, and its subsystems, provides the required process performance at a process system level. Equipment systems to be tested are defined in Section 01 75 00. To the extent possible, manually trigger alarms associated with each system and confirm that the alarms are properly displayed in the DCS. Wet Weather Pumping Systems - Water will be recirculated between the discharge structure and wetwell using the recirculation pipeline to test pumping systems and ancillary systems. Emergency Flood Pump System – EWH water may be used to allow testing and operation of each pump and both pumps in simultaneous	Wet Weather Pumping System: 3 days each pump. Emergency Flood Pump System: 3 days. Sump Pump System: 3 days. WWPS EWH and Seal Water System: 3 days. Odor Control System: 3 days HVAC System: 10 days	Wet Weather Pumps – 700,000 gallons of river water are required in the wetwell to allow testing and operation of a minimum of one pump at a time. See Section 01 50 00. EWH flow diverted for the purposes of pump testing must not affect other plant processes.

Tests	Testing Descriptions	Approximate Test Duration (Working Days)	Key External Constraints[1]
	operation. Sump Pump System - EWH water may be used to allow testing and operation of each pump and both pumps in simultaneous operation. WWPS EWH and Seal Water System - EWH water shall be used for testing and operation. During wet weather pump testing, both EWH and PCW shall be tested as a source of seal water. Odor Control System – Acceptance testing of odor control system does not require introduction of extraneous chemicals. Use air to test the functionality of the system.		
Performance Testing	Occurs after Acceptance Testing is complete. Test systems and subsystems together to verify the station is functional as a whole. Confirm the process criteria is met and demonstrate that control strategies listed in Section 40 61 96 are properly implemented. Demonstrate that all equipment start/stop sequences listed in Section 40 61 96 are functioning properly. Performance Testing shall be performed in the remote mode, controlled through the DCS, to demonstrate remote operation functionality. Pumping systems shall be tested over their entire operating ranges defined in Specification 43 23 16. Filling of the wet well may occur in phases to test wet weather pumps at the various speeds. Minimize draining and re-filling the wet well. All wet weather pumps shall be tested	20 days	Wet Weather Pumps – 3,150,000 gallons of river water is required to allow testing and simultaneous operation of two pumps spanning multiple wetwell elevations from 568.73 ft (minimum) to 722.75 ft (25-year wet weather event). See Section 01 50 00. After Performance Testing is complete, coordinate with the Owner for pumping to East Headworks to ensure there is adequate hydraulic capacity available.

Tests	Testing Descriptions	Approximate Test Duration (Working Days)	Key External Constraints[1]
	in different combinations. Anticipate a maximum of two pumps tested simultaneously. Water shall be recirculated between the discharge structure and wetwell using the recirculation pipeline to test pumping systems and ancillary systems. While pumping, both the PCW seal water system and the EWH seal water system shall be tested.		
Facility Start Up Period	Occurs after Performance Testing is complete. Continuous wet weather pump station operation using river water to test the entire pump station operation to simulate real-world operations. Coordinate with the Engineer to test operational scenarios not specifically tested during Performance Testing. Up to four pumps will be tested to a maximum flow rate of 120 mgd. Continuous operations shall include recirculating flows to the wetwell, pumping flows to East Headworks and flow splitting between the Headworks and recirculation pipeline. After Facility Startup is complete, drain the wet well by pumping to the East Headworks. Coordinate with the Owner for this operation.	15 days	3,200,000 gallons of river water are required to allow four pump operations over the entire pumping system operating ranges. River water shall be introduced as required to simulate operating levels. Coordinate with East Headworks to ensure there is adequate hydraulic capacity available. Transformer D must be fully available to handle WWPS electrical loads. Facility Start Up period must be completed prior to Ohio River Tunnel (ORT) connecting to the Tunnel Junction Structure.
Continuous Operations	Occurs after Substantial Completion. Station operation will be by the Owner during this phase. During this phase, the WWPS will begin operation using actual combined sewer overflow flows.	Varies with storm events	Cannot begin until the ORT has been connected to the Tunnel Junction Structure and the ORT commissioned.

Tests	Testing Descriptions	Approximate Test Duration (Working Days)	Key External Constraints[1]
			Transformer D must be fully available to the WWPS electrical loads.

1. Key external constraints and tests listed in this table are not exhaustive of all external constraints and required tests. Rather they are presented to provide the Contractors with information on the logistics of predecessors, duration and testing medium.

END OF SECTION

SECTION 07 51 00
BUILT-UP BITUMINOUS ROOFING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Section Includes:
   1. Built-up bituminous roofing with aggregate surfacing.

1.02 RELATED SECTIONS

A. This section contains specific references to the following related sections. Additional related sections may apply that are not specifically listed below.
   1. Section 06 10 00 Rough Carpentry
   2. Section 07 22 16 Roof Board Insulation
   3. Section 07 26 00 Vapor Retarder
   4. Section 07 62 00 Sheet Metal Flashing and Trim
   5. Section 07 71 00 Roof Specialties

B. This section contains references to the following documents. They are a part of this section as specified and modified. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

C. Unless otherwise specified, references to documents shall mean the documents in effect at the time of Advertisement for Bids or Invitation to Bid (or on the effective date of the Agreement if there were no Bids). If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, regardless of whether the document has been superseded by a version with a later date, discontinued or replaced.

Reference	Title
ASTM D41	Asphalt Primer used in Roofing, Dampproofing, and Waterproofing
ASTM D312	Asphalt Used in Roofing
ASTM D1863	Mineral Aggregate Used on Built-Up Roofs
ASTM D2178	Asphalt Glass Felt Used in Roofing and Waterproofing
ASTM D2822	Asphalt Roof Cement
ASTM D3617	Sampling and Analysis of New Built-Up Roof Membranes
ASTM D3672	Venting Asphalt-Saturated and Coated Inorganic Felt Base Sheet Used in Roofing

Reference	Title
FM Global Loss Prevention Data Sheets	1-28, Wind Loads to Roof Systems and Roof Deck Securement
FM Global Loss Prevention Data Sheets	1-29, Above-Deck Roof Components
FM Global Loss Prevention Data Sheets	1-28R and 1-29R, Roof Systems
FM Global Loss Prevention Data Sheets	1-49, Perimeter Flashing
FM Approvals 4470	Class 1 Roof Covers
FM Global	Research Technical Reports
UL 790	Tests for Fire Resistance of Roof Covering Materials; Class A
UL BMD	Building Materials Directory
AHJ Adopted Building Codes	

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination

1. Review installation procedures under this and other Sections and coordinate installation of items that must be installed with or before roofing system Work.

B. Pre-Installation Meeting

1. Prior to the installation of the Built-Up Bituminous roofing and associated work, the Contractor shall schedule and meet at the Site with the roofing installer, the roof system manufacturer, the installer of each component of associated work, the installers of deck and insulation to receive roofing work, the installers of other work in and around roofing which must follow the roofing work, including mechanical work, Engineer and other representatives directly concerned with performance of the Work. Review foreseeable methods and procedures related to the Built-Up Bituminous roofing work, including but not necessarily limited to, the following:

ADD NO.9

   a. Review project requirements, including Contract Documents.
   b. Review required submittals, both completed and yet to be completed.
   c. Review status of substrate including drying, structural loading limitations and similar considerations.
   d. Review availability of materials, tradesmen, equipment, and facilities required to make progress and avoid delays.
   e. Review required inspection, testing, certifying, and accounting procedures.
   f. Review weather and forecasted weather conditions, and procedures for coping with unfavorable conditions.

g. Review regulations concerning code compliance, FM compliance, environmental protection, health, safety, fire, and similar considerations.

h. Review procedures required for protection of roofing during the remainder of the Work.

C. Sequencing

1. Proceed with roofing system Work when preceding Work is ready to receive the Work of this Section.
2. Proceed with roofing system and associated Work:
   a. After curbs, blocking, substrate board, nailer strips, vents, drains and other projections through the substrates have been installed.
   b. When substrate construction and framing of openings is complete.
   c. When vapor retarder is installed.
   d. When roof board insulation is installed.
   e. When coverboard is installed.
3. Proceed with and complete the Work when materials, equipment and tradesmen required for the installation of building insulation and backfilling operations are at the Site and ready to follow with the Work in manner that does not leave the Work vulnerable to damage or deterioration.
4. Do not advance installation of building insulation beyond that necessary for proper sequencing of the Work. Do not advance the Work when there is no proper and secure protection from damaging weather and construction activities.

D. Scheduling

1. Environmental Conditions:
   a. Install roofing system when weather and temperature conditions comply with building insulations manufacturers' written recommendations.
   b. Install roofing system when damaging environmental condition are not forecasted for the time when exposed systems materials components would be exposed to potential damage from the elements.
   c. Product in this Section shall be subjected to environmental conditions in accordance with Section 01 11 80 Environmental Conditions.
   d. Do not apply roofing membrane during inclement weather
   e. Do not apply roofing membrane to damp or frozen deck surfaces
   f. Do no expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during the same day. The entire roof system (modified membrane base and cap sheets) shall be installed on the same day. Phasing of membrane installation is not allowed.

ADD NO. 9

   g. Record decisions, conditions, and agreements to proceed with the Work when weather conditions may be unfavorable. State reasons for proceeding, along with names of persons involved, and changes or revisions (if any), if required, to allow the Work to proceed.

1.04 SUBMITTALS

A. Action Submittals: The following information shall be provided in accordance with Section 01 33 00:

1. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with addendum updates included, with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (✓) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the Contractor, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The Construction Manager shall be the final authority for determining acceptability of requested deviations. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.
2. Shop Drawings: Submit the following:
    a. Copy of drawings completely dimensioned using field-verified dimensions on plans of each roof area and the accurate location of all roof penetrations roof mounted equipment, curbs, skylights and other features present on the roof areas specified by Engineer to be included under the Work of this Section and all details of construction and erection, including all flashing details coordinated with referenced specification sections under section 1.02, and FM Publications specified, and the location of all walkway pad patterns required by the Manufacturer for warranted construction and as shown. Contractor shall submit all details requiring consideration and the performance of the details shall be approved by the built-up roofing manufacturer for guaranteed construction as specified.
3. Product Data
    a. Manufacturer's specifications and product manuals indicating product information correlated to specified requirements, Manufacturer's installation instructions, maintenance instructions and other data as may be required by Engineer.
    b. Copies of the FM Global Loss Prevention Data Sheets and appropriate FM Global Research Technical Reports, indicating compliance with wind uplift pressure-resistant performance criteria, and the requirements for FM Approved 1-90 system construction and perimeter securement conditions.
4. Qualification Statements
    a. Provide qualification statements in section 1.05.B
5. Certificates
    a. Provide certificates specified in section 1.05.B
6. Samples
    a. Provide samples specified in section 1.05.C

B. Informational Submittals
   1. Copy of warranty as specified in paragraph 1.08.
   2. Operation and maintenance information in accordance with Section 01 33 04 Operating and Maintenance Manuals.

C. Closeout Submittals
   1. Procedures: Section 01 78 39.
   2. Operating and maintenance submittals: Section 01 33 04
   3. Provide warranty as specified in paragraph 1.08.
   4. Provide statement of application as specified in paragraph 1.05.B.4
   5. Test Reports as specified in paragraph 3.05.

1.05 QUALITY ASSURANCE

A. Qualifications
   1. Installer
      a. Engage a single installer skilled, trained and with successful experience in the installation of the type of Built-up Bituminous roofing system specified, who is a recognized roofing installer with specific skill and successful experience in the type of roofing specified in this Section, and equipped to perform workmanship in accordance with the Contract Documents, manufacturer's written instructions for guaranteed construction and the approved Shop Drawings and who agrees to employ only tradesmen with specific skill and successful experience in this type of work. Submit names and qualifications to the Engineer along with the following information on a minimum of three successful projects:
         1) Names and telephone numbers of owners, architects, or Engineers responsible for projects.
         2) Approximate contract cost of the Built-up Bituminous roofing.
         3) Amount of area installed.
      b. The roofing installer shall be an approved roofing applicator who has qualified for appointment and has been trained by the Manufacturer.
         1) Submit proof of acceptability of installer by the Manufacturer to Engineer
   2. Supplier
      a. The Manufacturer shall have ten (10) years of experience manufacturing Built-up Bituminous roofing in similar-sized projects. A minimum of three (3) on-site inspections per week with weekly photographic inspection reports.

ADD NO. 9

B. Certifications
   1. Installer and Supplier Qualification Statements complying with 1.05.A.
   2. Contractor’s Review: Accompanying approval request, submit to Engineer a written statement signed by the Contractor, stating that the Contract Documents for roofing, insulation, vapor retarder and flashing have been reviewed with an agent of the roofing material manufacturer and that they are in agreement that the selected systems are proper, compatible and that the details shown are not in conflict with the roofing manufacturer's roofing, insulation, and flashing details. Show by copy of

transmittal form that a copy of the statement has been transmitted to the Manufacturer.

3. Material Certifications: Certificates shall be provided from the manufacturer certifying that materials provided conform to all requirements specified herein and are chemically and physically compatible with each other and are suitable for inclusion within the total roof system specified herein.
4. Statement of Application: Upon completion of the Work, submit a statement to Engineer signed by the Contractor stating that the Work complies with the requirements of these Specifications and the installation methods comply with the Manufacturer's printed instructions and were proper and adequate for the condition of installation and use.

C. Field or Site Samples
   1. 12-inch by 12-inch sheet of each item specified and 6-inch-long pieces of each required system component to be used in the Work.
   2. Each fastener type required marked as to type of material and with their intended purpose in the Work.
   3. All components of the built-up roofing and flashing labeled with their intended use in the Work. Compliance with all other requirements is exclusive responsibility of the Contractor.
   4. Color samples of cap sheet

1.06 DELIVERY, STORAGE AND HANDLING

A. Procedures: Section 01 65 50

B. Manufactured roofing materials shall be delivered in manufacturers' original unopened containers and rolls with labels intact and legible. Where materials are covered by a referenced specification, the containers shall bear the specification number, type, and class as applicable. Materials shall be delivered in sufficient quantity to allow continuity of work. Roll materials shall be handled to prevent damage to edges and ends, and shall be protected against wetting and moisture absorption; they shall be stored on pallets and covered with canvas tarpaulins to keep them clean and dry. Polyethylene covering is not an acceptable method of protecting materials. Materials temporarily stored on the roof shall be located in approved areas and shall be distributed to stay within the indicated live load limits of the roof construction.

1.07 PROTECTION OF PROPERTY

A. Flame heated equipment shall be located and used so as not to endanger the structure or other materials on the site or adjacent property. Flame heated equipment shall not be placed on the roof of any structure.

B. Protective coverings shall be provided at all paving and building walls adjacent to hoist and kettles prior to starting the work. Protective coverings shall be lapped at least 6 inches, shall be secured against wind, and shall be vented to prevent collection of moisture on covered surfaces. Protective coverings shall remain in place for the duration of the roofing work.

1.08 WARRANTY

A. Provide the following warranties:
   1. A manufacturer's warranty shall be furnished for the roofing system. The warranty shall provide, but not be limited to the following:
      a. The warranty shall be issued directly to the Owner.
      b. The warranty period shall be not less than 20 years from the date of acceptance of the work.
   2. The warranty shall cover the overall performance of the system including membrane flashing and the certification that all materials have been installed in accordance with the drawings and specifications.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. The Engineer believes that the Manufacturers indicated in this Section are capable of producing equipment and products, which will satisfy the requirements of this Section. This statement, however, shall not be construed as an endorsement of a particular Manufacturer or product, nor shall it be construed that a named Manufacturer's standard product will comply with the requirements of this Section.
   1. The Garland Company
   2. Soprema
   3. Tremco Roofing
   4. Or Approved Equal

2.02 ROOFING SYSTEM

A. Unless otherwise specified, roofing systems shall be as follows:
   1. Vapor Barrier ~~Type A~~:
      a. 110 SBS (Styrene-Butadiene-Styrene) rubber modified base sheet reinforced with fiberglass scrim. Designed for torch applications with burn-off backer that indicates when the material is hot enough to be installed,
         1) Tensile Strength, ASTM D 5147
            a) 2 in/min. @73.4 +/- 3.6 deg. F MD 210 lbf/in XD 210 lbf/in
            b) 50 mm/min. @23 +/- 2 deg. C MD 36.75 kN/m XD 36.75 kN/m
         2) Tear Strength, ASTM D 5147
            a) 2 in/min. @73.4 +/- 3.6 deg. F MD 300 lbf/in XD 300 lbf/in
            b) 50 mm/min. @23 +/- 2 deg. C MD 1,334 N XD 1,334 N
         3) Elongation at Maximum Tensile, ASTM D 5147
            a) 2 in/min. @73.4 +/- 3.6 deg. F MD 6% XD 6%
            b) 50 mm/min. @23 +/- 2 deg. C MD 6% XD 6%

   2. Base (Ply) Sheet:

ADD NO. 9

a. 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified base sheet reinforced with fiberglass and polyester composite scrim, performance requirement according to ASTM D 5147. ADD NO. 9
   1) Tensile Strength, ASTM D 5147
      a) 2 in/min. @73.4 +/- 3.6 deg. F MD 310 lbf/in XD 310 lbf/in
      b) 50 mm/min. @23 +/- 2 deg. C MD 54.25 kN/m XD 54.25 kN/m
   2) Tear Strength, ASTM D 5147
      a) 2 in/min. @73.4 +/- 3.6 deg. F MD 650 lbf/in XD 650 lbf/in
      b) 50 mm/min. @23 +/- 2 deg. C MD 2,891 N XD 2,891 N
   3) Elongation at Maximum Tensile, ASTM D 5147
      a) 2 in/min. @73.4 +/- 3.6 deg. F MD 8% XD 8%
      b) 50 mm/min. @23 +/- 2 deg. C MD 8% XD 8%
   4) Low Temperature Flexibility, ASTM D 5147
      a) Passes -30 deg. F (34.4 deg. C)

~~b. Four ply, hot asphalt applied modified bitumen membrane system with mineral granule surface cap sheet as the fourth ply~~

~~c. Provide manufacturer's recommended high density fiberboard, 1/2 inches thick, above insulation where required by the Contract Documents or where required by the manufacturer to meet design requirements.~~ ADD NO. 9

~~d. Provide vapor retarder.~~

~~e. Color shall be white.~~

3. Modified Cap (Ply) Sheet:
   a. 115 mil SBS (Styrene-Butadiene-Styrene) rubber modified membrane incorporating post-consumer recycled rubber and reinforced with fiberglass and polyester composite scrim, ASTM D 6162, Type III Grade G. ADD NO.9
      1) Tensile Strength, ASTM D 5147
         a) 2 in/min. @73.4 +/- 3.6 deg. F MD 550 lbf/in XD 500 lbf/in
         b) 50 mm/min. @23 +/- 2 deg. C MD 96.25 kN/m XD 87.5 kN/m
      2) Tear Strength, ASTM D 5147
         a) 2 in/min. @73.4 +/- 3.6 deg. F MD 900 lbf/in XD 950 lbf/in
         b) 50 mm/min. @23 +/- 2 deg. C MD 2,557 N XD 2,535 N
      3) Elongation at Maximum Tensile, ASTM D 5147
         a) 2 in/min. @73.4 +/- 3.6 deg. F MD 10% XD 10%
         b) 50 mm/min. @23 +/- 2 deg. C MD 10% XD 10%
      4) Low Temperature Flexibility, ASTM D 5147
         a) Passes -30 deg. F (34.4 deg. C)
      5) Recycled Content (Pre-Consumer):27%
      6) Recycled Content (Post-Consumer): 12%
      7) Bio-Based Content: 1%

4. Interply Adhesive: ADD NO. 9

a. Generic Type III Asphalt: Hot Bitumen, ASTM D 312, Type III steep asphalt having the following characteristics:
   1) Softening Point 185 deg. F -205 deg. F
   2) Flash point 500 deg. F
   3) Penetration @ 77 deg. F 15-35 units
   4) Ductility @ 77 deg. F 2.5 cm

5. Flashing Base-Ply:
   a. 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified base sheet reinforced with fiberglass and polyester composite scrim, performance requirement according to ASTM D 5147.

ADD NO. 9

      1) Tensile Strength, ASTM D 5147
         a) 2 in/min. @73.4 +/- 3.6 deg. F MD 310 lbf/in XD 310 lbf/in
         b) 50 mm/min. @23 +/- 2 deg. C MD 54.25 kN/m XD 54.25 kN/m
      2) Tear Strength, ASTM D 5147
         a) 2 in/min. @73.4 +/- 3.6 deg. F MD 650 lbf/in XD 650 lbf/in
         b) 50 mm/min. @23 +/- 2 deg. C MD 2,891 N XD 2,891 N
      3) Elongation at Maximum Tensile, ASTM D 5147
         a) 2 in/min. @73.4 +/- 3.6 deg. F MD 8% XD 8%
         b) 50 mm/min. @23 +/- 2 deg. C MD 8% XD 8%
      4) Low Temperature Flexibility, ASTM D 5147
         a) Passes -30 deg. F (34.4 deg. C)

6. Flashing Cap (Ply) Sheet
   a. 115 mil SBS (Styrene-Butadiene-Styrene) rubber modified membrane incorporating post-consumer recycled rubber and reinforced with fiberglass and polyester composite scrim, ASTM D 6162, Type III Grade G.

ADD NO. 9

      1) Tensile Strength, ASTM D 5147
         a) 2 in/min. @73.4 +/- 3.6 deg. F MD 550 lbf/in XD 500 lbf/in
         b) 50 mm/min. @23 +/- 2 deg. C MD 96.25 kN/m XD 87.5 kN/m
      2) Tear Strength, ASTM D 5147
         a) 2 in/min. @73.4 +/- 3.6 deg. F MD 900 lbf/in XD 950 lbf/in
         b) 50 mm/min. @23 +/- 2 deg. C MD 2,557 N XD 2,535 N
      3) Elongation at Maximum Tensile, ASTM D 5147
         a) 2 in/min. @73.4 +/- 3.6 deg. F MD 10% XD 10%
         b) 50 mm/min. @23 +/- 2 deg. C MD 10% XD 10%
      4) Low Temperature Flexibility, ASTM D 5147
         a) Passes -30 deg. F (34.4 deg. C)
      5) Recycled Content (Pre-Consumer):27%
      6) Recycled Content (Post-Consumer): 12%
      7) Bio-Based Content: 1%

7. Flashing Ply Adhesive:
   a. Generic Type III Asphalt (Base Flashing): Hot Bitumen, ASTM D 312, Type III steep asphalt having the following characteristics:

ADD NO. 9

1) Softening Point 185 deg. F -205 deg. F
2) Flash point 500 deg. F
3) Penetration @ 77 deg. F 15-35 units
4) Ductility @ 77 deg. F 2.5 cm

b. Asphalt roofing mastic V.O.C. Compliant, ASTM D 4586, Type II trowel grade flashing adhesive.
1) Non-Volatile Content ASTM D 4479 70 min.
2) Density ASTM D 1475 8.3 lbs./gal. (1kg/l)
3) Flash point ASTM D 93 103 deg. F (39 deg. C)

8. Surfacing Flood Coat/ Aggregate:
a. Coal Tar protective roof coating; heavy-bodied, fiber reinforced, cold process polymer modified, coal tar roof coating having the following characteristics: ADD NO. 9
1) Weight/ Gallon 9.0 lbs./gal/ (1.07 g/cm3)
2) Solids by weight 87%
3) Viscosity; Brookfield Heliopath, 2.5 rpm 120,000 cPs
4) Roofing Aggregate: ASTM D 1863
a) Texas White #7

b. Flashings: White elastomeric roof coating:
1) Weight/Gallon 8.4 lbs./gal. (1.40 g/cm3)
2) Non-Volatile % (ASTM D 1644) 64 min

2.03 MATERIALS

A. Asphalt Bitumen:

Roof slope, in/ft	¼" per foot
Specification	ASTM D312
Type	Type IV

1. Each container of asphalt shall be plainly marked with the flash point (FP), equiviscous temperature (EVT) and finished blowing temperature (FBT).

~~B. Felts:~~

~~1. Felts for built up bituminous roofing and flashing shall conform to specifications and requirements listed in the following table:~~ ADD NO. 9

~~Designation~~	~~Use~~	~~Felt~~	~~Impregnant~~	~~Coating~~	~~Specification~~
~~GB~~	~~Base/Ply Felt~~	~~Glass – 6 Ply~~	~~Asphalt~~	~~Asphalt~~	~~ASTM D2178, Type VI, UL TYPE G1 BUR~~

ADD NO. 9

~~GA~~	~~Cap Felt~~	~~Premium Fire Retarding Glass~~	~~Asphalt~~	~~Aggregate~~	~~ASTM D6162, Type III, 140 mils min. thickness, 400 lbs tensile/tear strength (ASTM D5147)~~
~~FF~~	~~Flashing Felt~~	~~Glass~~	~~Asphalt~~	~~Asphalt~~	~~–~~

~~*Notes:*~~

~~1. *Glass base sheet shall be an asphalt impregnated glass mat consisting of uniformly distributed monofilament type glass fibers with glass textile yarn reinforcing and specifically manufactured for use as a base sheet for built up roofs. The base sheet shall be coated with asphalt on both sides.*~~

ADD NO. 9

~~2. *Flashing felt shall be of a type specifically prepared in the manufacturing process for use in two-ply base flashing construction and shall be one of two types: a single thickness of glass felt conforming to the properties listed in ASTM D2178 for Type IV, or glass felt factory laminated to a woven glass fiber scrim or cotton fabric. Both types of flashing construction shall be factory-coated on both sides with an asphaltic coating which may include a fine mineral stabilizer insoluble in water and fine mineral surfacing.*~~

C. Asphalt Primer:
   1. Asphalt primer shall conform to ASTM D41.

D. Asphalt Roof Cement:
   1. Asphalt roof cement shall be asbestos free, meeting the requirements of ASTM D2822; Type I for horizontal surfaces, or Type II for vertical surfaces and built-up bituminous base flashings.

E. Aggregates:
   1. Aggregates for surfacing built-up roofings shall be ~~light colored~~ white, water- worn gravel, crushed stone, crushed slag, all conforming to ASTM D1863; or marble, expanded slag, or expanded shale, all conforming to ASTM D1863 except that density shall not be less than 55 lb/cu ft. Aggregate shall be opaque.

ADD NO. 9

F. Fasteners:
   1. General:
      a. Fasteners shall be non-ferrous metal or galvanized steel, except that hard copper nails shall be used for copper items; aluminum or stainless steel nails shall be used for aluminum items; and stainless steel nails shall be used for stainless steel items. For roofing felts, fasteners shall be flush-driven through flat metal discs of zinc-coated sheet metal not lighter than 28 gage and not less than 3/8 inch in diameter. Discs shall be formed to prevent dishing. Bell or cup-shaped caps are not acceptable. Metal discs may be omitted when one-piece composite fasteners with heads not less than 1 inch in diameter or 1-inch square with rounded or tapered corners are used.
      b. Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening substrate panel to roof deck.
   2. Wood Fasteners:
      a. Fasteners for securing felts and metal items to wood nailers or wood or plywood substrates shall be 11 gauge annular threaded shank nails with 7/16 to 5/8-inch diameter heads; or one-piece composite nails with annular threaded shanks not

less than 11 gage. Fasteners shall be long enough to penetrate the nailer not less than 1 inch; the wood substrate not less than 5/8 inch, and plywood substrate 3/8 to 7/16 inch, but not to protrude through the underside of the deck.

3. Gypsum and Concrete Fasteners:
   a. Fasteners for securing felts to cast-in-place gypsum and lightweight insulating concrete substrates shall be special self-clinching fasteners of a type approved by the substrate material manufacturer having a resistance to pull out of not less than 40 pounds.
4. Masonry or Concrete Wall Fasteners:
   a. Fasteners for securing felts and metal items to masonry or concrete walls and vertical surfaces shall be hardened steel nails with flat heads, diamond shaped points, and mechanically deformed shanks not less than one inch long.

G. Pressure Relieving Vents: Plastic or Metal one-way valves. Provide vents in accordance with manufacturer's recommendations. Vents may be omitted if manufacturers provided written documentation noting vents are not required to maintain warranty. ADD NO. 9

H. Roof Insulation
   1. Refer to Section 07 22 16 Roof Board Insulation.

I. ~~Substrate~~ Cover Board ADD NO. 9
   1. Provide manufacturer's recommended high density fiberboard, 1/2 inches thick, above insulation where required by the Contract Documents or where required by the manufacturer to meet design requirements.
   2. ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2-inch thick.

~~J. Vapor Retarder:~~
   ~~1. Polyethylene Film: reference section 07 26 00.~~
   ~~2. Tape: Pressure sensitive tape of type recommended by vapor retarder manufacturer for sealing joints and penetrations in vapor retarder.~~ ADD NO. 9

2.04 PRODUCT DATA

A. The following information shall be provided in accordance with Section 01 33 00:
   1. Certificates specified in paragraph 1.03 Material Certification.
   2. Warranty specified in paragraph 1.03 Warranty for Built-Up Roofing.

PART 3 EXECUTION

3.01 CONDITION OF SURFACES

A. The Contractor shall ensure that the following conditions exist prior to application of the roofing materials:

1. Drains, scuppers, curbs, cants, expansion joints, perimeter walls, roof penetrating components, and equipment supports are in place.
2. Surfaces are rigid, dry, smooth, and free from cracks, holes, and sharp changes in elevation. Joints in deck substrate are suitably sealed to prevent drippage of bitumen into building or down exterior walls.
3. The plane of the substrate does not vary more than 1/4 inch within an area 10 feet by 10 feet when checked with a 10-foot straight edge placed anywhere on the substrate in any direction.
4. Substrate is sloped as indicated to provide drainage.
5. Walls and vertical surfaces are constructed to receive counterflashing, and treated wood nailers are in place to permit nailing of the base flashing at a minimum finish height of 8 inches above the finished roofing membrane surface.
6. Treated wood nailers are securely fastened in place at eaves, gable ends, openings, and intersections with vertical surfaces for securing of felts, edging strips, gravel stops, and roof fixtures.
7. Cants are securely fastened in place in the angles formed by walls and other vertical surfaces. The angle of the cant is 45 degrees and the vertical height is not less than 4 inches.
8. Insulation boards are installed smooth and even and are not broken, cracked, or curled.

3.02 PREPARATION

A. General:
   1. Contractor shall coordinate the work with that of other trades to assure that components which are to be secured to or stripped into the roofing system are available and that flashing and counterflashing is installed as the work progresses.

B. Priming of Surfaces:
   1. Surfaces shall be primed at the rate of 0.75 gallons per 100 square feet.
   2. Flanges of metal gravel stops, edging strips, flashing collars and accessories shall be primed with asphalt roof cement prior to stripping into the roofing system.
   3. Concrete or masonry surfaces which are to receive base flashing shall be coated uniformly with primer. Primer shall be allowed to dry thoroughly prior to application of the roofing and flashing materials.

C. Heating of Bitumen:

D. Solid bitumen shall be broken up on a surface free of dirt and debris and heated in a kettle designed to prevent contact of flame with surfaces in contact with the bitumen. Each kettle shall have a visible thermometer and thermostatic controls set to the temperature limits specified herein. Controls shall be maintained in working order and calibrated. A use immersion thermometer accurate to "plus or minus 2 degrees F" shall be used to check temperatures of the bitumen frequently. If temperatures exceed maximums specified, the bitumen shall be removed from the site. Upon determination that the temperature of the bitumen at the instant of application is below the minimum specified, the affected roofing shall be removed and replaced with new material. Cutting back, adulterating, or fluxing of bitumen is not permitted.

E. Precast Concrete:

1. Desks shall be clean, dry, fully cured, and free of flaws and attached securely to the supporting structure as recommended by the deck manufacturer. ADD NO. 9
2. All joints shall be caulked or grouted.
3. Concrete surfaces to receive roofing shall be fully primed at the rate of 1 gallon per 100 sq. ft.
4. When applying roofing or insulation directly to the deck with asphalt, prime with asphalt/concrete primer, ASTM D 41, at a rate of 1 gal/square (.4 L/m2) and allow the primer to dry prior to the application of the roofing system. Hold back bitumen at the joints approximately 4 inches (102 mm) to prevent bitumen drippage.
5. Deck joints shall be stripped in with a 12 inch (305 mm) wide strip of modified membrane unadhered a minimum of 2 inches (51 mm) immediately on either side of the joint.

3.03 APPLICATION

A. General:

1. Contractor shall (1) apply roofing materials as specified unless specified or recommended otherwise by the materials manufacturer's printed application instructions and the differences noted and approved; and (2) apply only as much roofing in one day as can be protected the same day. Phasing of roof piles is not permitted. The entire roof system, including modified membrane base and cap sheets shall be installed on the same calendar day. ADD NO. 9
2. Contractor will not be permitted to apply roofing materials during inclement weather or when air temperature is below 40 degrees F, or when there is ice, frost, surface moisture, or visible dampness on the roof deck.

B. Bitumen Stops:

1. Bitumen stops shall be provided at roof edges, openings, and at vertical projections prior to application of the felts. Bitumen stops shall be formed with two 12-inch-wide strips of plying felt. Strips shall be laminated with, and set into, a coating of asphalt roof cement with one half of the width overhanging the edge of the roof or opening. Where nailers are provided, the strips shall be nailed with roofing nails in addition to embedding in asphalt roof cement. After the plies of felt are in place, the free portion of the strips shall be folded back over the roofing membrane, embedded in a continuous coating of asphalt roof cement, and where nailers are present, secured with roofing nails.

~~C. Felts:~~

~~1. Mechanically fastened base felts shall be applied.~~
~~2. Plying felts shall be applied shingle fashion in hot moppings of bitumen and back nailed where specified. Starter sheets of felt shall be provided to maintain the specified number of felt plies throughout the roofing. The application of all plies of roofing felts, excluding surfacing, shall be completed in one continuous operation. Felts shall be applied with side laps in accordance with the materials manufacturer's printed instructions; end laps shall be not less than 6 inches and staggered a minimum of 36 inches. Unless otherwise specified, felts shall be applied at right angles to the roof slope so that the direction of flow of water is over and not against~~ ADD NO. 9

~~the laps. Felts shall extend 2 inches above the tops of cant strips at vertical surfaces and to the tops of cant strips elsewhere. Felts shall be trimmed to a neat fit around vent pipes, roof drains, and other projections through the roof.~~

~~3. In addition to hot mopping of plying felts with hot bitumen, back-nail felts in accordance with standards and manufacturer recommendations.~~

D. ~~Hot Mopping~~ Installation Hot Applied Roof System:

ADD NO. 9

1. Vapor Retarder: Install one torch ply to the entire surface. Shingle in direction of slope of roof to shed water on each area of roof. Vapor Barrier shall extend to roof membrane termination or the top of the parapet walls to allow for sufficient tie-in with the roof membrane.
   a. Spray, brush, or roller apply Pro-Stop FR Primer to all wood components including, but not limited to, wood decking, sheathing, nailers at ½ gal/sq or 8 wet mils (200 sf/gal) when installing a torch applied vapor barrier. Reference technical data sheets for further installation instructions and limitations.
2. Base Ply(s): Install base sheet in twenty five (25) lbs (11.3kg) per square of bitumen shingled uniformly to achieve one or more plies over the entire prepared substrate. Shingle in direction of slope of roof to shed water on each area of roof. Do not step on base rolls until asphalt has cooled, fish mouths should be cut and patched.
   a. Lap ply sheet ends 8 inches (203 mm). Stagger end laps 2 inches (304mm) minimum.
   b. Install base flashing ply to all perimeter and projection details after membrane application.
   c. Extend plies 2 inches beyond top edges of cants at wall and projection bases.
   d. Install base flashing ply to all perimeter and projection details.
   e. Allow the one ply of base sheet to cure at least 30 minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.
3. Modified Cap Ply(s): Solidly bond the modified membrane to the base layers with specified material at the rate of 25 to thirty 30 lbs. (11-13kg) per 100 square feet.
   a. Roll must push a puddle of hot material in front of it with material slightly visible at all side laps. Use care to eliminate air entrapment under the membrane. Exercise care during application to eliminate air entrapment under the membrane
   b. Apply pressure to all seams to ensure that the laps are solidly bonded to substrate
   c. Install subsequent rolls of modified membrane as above with a minimum of 4 inch (101 mm) side laps and 8 inch (203 mm) end laps. Stagger end laps. Apply membrane in the same direction as the previous layers but stagger the laps so they do not coincide with the laps of the base layers.
   d. Apply hot material no more than 5 feet (1.5 m) ahead of each roll being embedded.
   e. Extend membrane 2 inches (50 mm) beyond top edge of all cants in full moppings of the specified hot material.
4. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant

may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.

5. Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips.
    a. Provide nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.
    b. Wood nailers should match the height of any insulation, providing a smooth and even transition between flashing and insulation areas.
    c. Nailer lengths should be spaced with a minimum 1/8 inch gap for expansion and contraction between each length or change of direction.
    d. Nailers and flashings should be fastened in accordance with Factory Mutual "Loss Prevention Data Sheet 1- 49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs/lineal foot in any direction.
6. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified in Section 07 62 00 - Sheet Metal Flashing and Trim.
7. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.
8. Flashing Base Ply:
    a. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
    b. Prepare all walls, penetrations, expansion joints and surfaces to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
    c. Adhere to the underlying base flashing ply with specified hot material unless otherwise noted in these specifications. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
    d. Solidly adhere the entire sheet of flashing membrane to the substrate.
    e. Coordinate counter flashing, cap flashings, expansion joints, and similar work with modified bitumen roofing work as specified.
    f. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.
9. Flashing Cap Ply: Install flashing cap sheets by the same application method used for the cap ply.
    a. Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
    b. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
    c. Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system work.
    d. All stripping shall be installed prior to flashing cap sheet installation.

e. Heat and scrape granules when welding or adhering at cut areas and seams to granular surfaces at all flashings.

f. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

g. Seal all vertical laps of flashing membrane with a three-course application of trowel-grade mastic and mesh.

10. Flood Coat/ Aggregate:

a. Install after cap sheets and modified flashing, tests, repairs and corrective actions have been completed and approved.

b. Apply flood coat materials at 5 gal/SQ.

c. Uniformly embed aggregate in the flood coat of cold adhesive at a rate recommended by the manufacturer.

d. Aggregate must be dry and placed in a manner required to form a compact, embedded overlay. To aid in embedment, lightly roll aggregate.

11. Flashing Coating:

a. After flashing base and cap sheets have been installed and inspected/approved by the roofing manufacturer.

b. Apply base coat at 1.0 Gal/SQ

c. Allow to dry.

d. Apply top coat at 1.0 Gal/SQ

~~12. The felts shall be applied immediately following the application of the hot asphalt. Working ahead with the asphalt is not permitted. The asphalt shall be completely fluid, with mop temperatures within the specified EVT range, at the instant the felts come into contact with the asphalt. Application of asphalt between felts shall be such as to provide voidless coverage and complete penetration of asphalt into the felt above and below.~~

ADD NO. 9

~~13. Asphalt shall be heated and applied at the temperatures specified below unless otherwise specified by the manufacturer. Asphalt shall not be heated above its finished blowing temperature (FBT) for longer than 4 consecutive hours, and shall not be heated to the flash point (FP). Asphalt shall be applied and roofing felts embedded when the temperature of the asphalt is within plus or minus 25 degrees F of the equiviscous temperature (EVT).~~

~~E. Flashing:~~

~~1. General:~~

~~a. Built up bituminous flashing shall be provided in the angles formed where the roof deck abuts walls, curbs, ventilators, pipes, and other vertical surfaces, and where necessary to make the work watertight. Flashing shall be installed after all plies of felt have been applied but before the top surfacing is applied. Metal flashings are specified under Section 07 62 00.~~

ADD NO. 9

~~b. Install one pressure relief vent per 1,000 square feet or part thereof, or roof surface.~~

~~2. Base Flashing:~~

a. ~~Unless otherwise specified, base flashing shall consist of one ply of plying felt used in the roofing membrane and one ply of flashing felt embedded in flashing cement, or hot mopped, in accordance with approved manufacturer's installation instructions.~~

3. ~~Strip Flashing:~~

a. ~~Flanges of sheet metal work to be incorporated into the roofing system shall be set into a uniform coating of asphalt roof cement and stripped in with two layers of plying felt cemented to the tops of the flanges, roofing membrane, and to each other with coatings of asphalt roof cement. The felts shall be extended 3 and 6 inches, respectively, beyond the edges of the flanges and onto the roofing membrane. Finished strip flashing shall be coated with asphalt roof cement.~~

F. ~~Aggregate Surfacing:~~

1. ~~Surfacing materials shall be applied after felt flashings, tests, repairs, and corrective actions have been completed and approved. Aggregate shall be uniformly embedded in a flood coat of hot asphalt. Loose aggregate shall be swept up and removed from the roof.~~

ADD NO. 9

3.04 WALKWAYS

A. Mineral-surfaced asphalt plank or granular surfaced treads shall be provided for access to mechanical equipment and for all traffic areas, where specified. Asphalt planks or treads shall be installed on top of the completed aggregate surfacing after loose aggregate has been swept clear of the area in a hot-mopping of Type III asphalt, applied at the rate of 25 pounds per 100 square feet. A space 6 inches wide shall be provided between adjacent planks for drainage. Provide walkways from point of access to roof installed equipment and at each side of roof installed equipment.

3.05 FIELD TESTS

A. After application of the specified roofing felts and prior to applying surfacing, field samples of built-up roofing shall be taken from the deck in the presence of the Construction Manager. The Construction Manager will inspect the sample for specified number of plies, lap widths, evenness of application of bitumen, bond between plies, skips or voids in the interply moppings, presence of harmful foreign materials, visible presence of moisture in the sandwich, and wet insulation. Samples (4-inch by 40-inch) shall be taken in accordance with ASTM D3617 and cut across laps in felts in a manner to expose the specified number of plies. The 4-inch edge shall coincide with an edge lap of felt and shall not be positioned over an end lap. Areas where samples are to be taken shall be selected by the Construction Manager immediately prior to cutting. Roofing will not be permitted to proceed until all deficiencies disclosed as a result of "cut tests" have been corrected and approved.

B. Not less than two samples shall be taken from each 100 squares of roofed area, and at least one sample shall be taken from each day's application, regardless of the quantity applied. If the samples taken show any deficiency, no matter how slight, additional samples will be required in order to determine the extent of the deficiency.

C. Where interply moppings are too light, deficient areas shall have an additional ply of felt applied in a full mopping of bitumen. Felt shall be applied with 4-inch side and end laps.

Where free water, or any voids, skips or any delamination whatsoever, is discovered between the plies, the affected area shall be removed and rebuilt in dry conditions. Where insulation is found to be wet, the insulation shall be removed and new built-up roofing and insulation shall be provided.

D. Immediately after inspection, the cut-out sample shall be replaced. Should it become impossible to immediately replace the cut-out sample in the roof, a new section of equivalent size and structure shall be substituted.

E. The area over replaced samples shall then be covered with ~~4 plies of ply felt,~~ modified membrane base and cap sheet hot-mopped in place with the first ply overlapping the cutout area 3 inches on all sides and each succeeding ply overlapping the previous ply 3 inches on all sides. ADD NO. 9

F. Manufacturer Roof Inspection: Roofing system manufacturer's technical personnel to inspect roofing installation at minimum intervals of three (3) days per week or every other working day and upon completion. Weekly photographic progress reports are to be provided to the Engineer and Owner. ADD NO. 9

END OF SECTION

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SECTION 08 91 19
FIXED LOUVERS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Section Includes:
   1. This section specifies intake and exhaust air louvers and accessories.

B. Performance and Design Requirements:
   1. General: Louver shall be suitable for air supply or discharge service and shall be sized as shown on the Contract Drawings.

1.02 QUALITY ASSURANCE

A. Reference:
   1. This section contains references to the following documents. They are a part of this section as specified and modified. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.
   2. Unless otherwise specified, references to documents shall mean the documents in effect at the time of Advertisement for Bids or Invitation to Bid (or on the effective date of the Agreement if there were no Bids). If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, regardless of whether the document has been superseded by a version with a later date, discontinued or replaced.

Reference	Title
AA 45	Designation System for Aluminum Finishes
AMCA Standard 500	Test Methods for Louvers, Dampers, and Shutters
ASTM B221	Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes
ASTM C1071	Standard Specification for Thermal and Acoustical Insulation (Mineral Fiber, Duct Lining Material)

B. Certification:
   1. Louvers shall bear the AMCA certified ratings seal for both air performance and water penetration.

1.03 **SUBMITTALS**

A. Action Submittals:

1. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with addendum updates included, with each paragraph check-marked to indicate specification requirements. Check marks (✓) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the Contractor, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The Construction Manager shall be the final authority for determining acceptability of requested deviations. The remaining portions of the paragraph not underlined will signify compliance on the part of the contractor with the specifications. Failure to include a copy of the marked-up specification sections, along with justifications(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

Add. No. 9

2. Product Data:
   a. Detail specifications and instruction for installation, adjustments, cleaning, and maintenance.
3. Shop Drawings:
   a. Include details of materials, construction, size, pattern, color and finish. Include relationship with adjacent construction. Color to be selected from manufacturer standard color line.

B. Informational Submittals:

1. Procedures: Section 01 30 00
2. Operation and maintenance information specified in Section 01 33 04.
3. Product Data:
   a. Manufacturer's data sheets on each product to be used .
   b. Preparation instructions and recommendations
   c. Storage and handling requirements and recommendations.
   d. Typical installation methods.

C. Closeout Submittals:

1. Procedures: Section 01 30 00
2. Operating and maintenance submittals: Section 01 33 04

PART 2 PRODUCTS

2.01 ACCEPTABLE PRODUCTS

A. Louvers shall be Airolite, Construction Specialties, Ruskin, or equal, modified to provide the specified features.

2.02 MATERIALS

Component	Material
Blades	ASTM B221, 6063-T52 extruded aluminum alloy
Frame	ASTM B221, 6063-T52 extruded aluminum alloy
Fasteners	Stainless steel or aluminum
Bird screen	Aluminum

2.03 EQUIPMENT FEATURES

A. Blades:
   1. Blades shall be of the fixed, drainable type with interlocking blade braces to provide an uninterrupted horizontal line. Blades for all louvers shall be minimum 0.081 inch (12 gage) thick. Slideable interlocked mullions shall have provisions for expansion and contraction.

B. Frame:
   1. The frame shall be minimum 0.081 inch (12 gage) thick for all louvers. The louver frame shall be assembled by welding. The head, sill, and jamb shall be one-piece structural members and shall have an integral calking slot and retaining bead.

C. Screen:
   1. The louver shall be furnished with a removable bird screen constructed of 1/2-inch mesh, 16-gage (0.063 inch) wire and secured within a 10-gage extruded aluminum frame. The screen shall be mounted on the interior louver face but independent of the louver.

D. Design
   1. Provide all louvers 6” deep.
   2. Anchorage design by manufacturer and/or Contractor.

E. Finish:
   1. Exposed Aluminum Polyvinylidene Fluoride Based Coating: Apply full strength polyvinylidene fluoride based coatings at the factory by coil coating for sheet material and spray coating for extruded or factory-fabricated material. Provide a four-coat system.
   2. Color: Full selection of manufacturer's standard, custom and premium colors for final selection by Owner.
   3. Product and Manufacturer:
      a. Duranar Metallic XL Specialty Color 4-Coat System by PPG Industries Coatings and Resin Division, Incorporated.
      b. or approved equal.

2.04 ACOUSTICAL LOUVERS

A. Acoustical louvers shall be as specified in paragraph 2.03 and shall be provided with the additional features specified herein. Acoustical louvers shall be the stationary type with insulated blades. The blades shall be insulated with mineral fiber conforming to ASTM C1071 requirements for acoustical insulation. The mineral fiber shall be held in place by a perforated aluminum sheet which completely covers the insulation and is securely fastened to the underside of the louver blade.

2.05 COMBINATION LOUVERS

A. Combination louver shall be a stationary blade type louver and adjustable blade damper mounted together in a common frame. The stationary louver and frame shall be as specified in paragraphs 2.02 and 2.03. The adjustable blades shall be extruded 6063T5 aluminum, 0.125 inch (8 gage) thick. The adjustable blade linkage shall be concealed in the louver frame and located out of the air stream. Vinyl edge seals shall be provided on the damper blades. The adjustable blades shall pivot on 1/2-inch diameter aluminum or steel pins located at the blade ends and attached to the operator linkage. The pivot pins shall be mounted on self-lubricating nylon or oil impregnated bronze bearings. Jamb seals shall be provided to prevent air leakage around closed damper blades.

2.06 OPERATORS

A. Electric Actuators:
   1. Operators for combination louvers, where specified, shall be 120-volt motor actuators provided complete with all necessary linkage to position the damper throughout its full operating range. The actuator shall be mounted on the outside of the louver frame and shall have sufficient torque to position the size of damper served at the specified conditions. The damper area served by each operator shall not exceed the maximum area recommended by the actuator manufacturer. Time required for the operator's full stroke shall not exceed 1 minute.

B. Pneumatic Actuators:
   1. Operators for combination louvers, where specified, shall be piston, rolling diaphragm type pneumatic actuators provided complete with all necessary linkage to position the damper throughout its full operating range. The actuator shall be mounted outside of the louver frame and shall have sufficient torque and length of travel to accurately position the size of damper served at the specified conditions. The damper area served by each actuator shall not exceed the maximum area recommended by the actuator manufacturer. Time required for the operator's full stroke shall be 1 minute.

2.07 PRODUCT DATA

A. Certified results of pressure drop test data and water penetration data for all louvers shall be provided in accordance with Section 01 33 00.

PART 3 EXECUTION

3.01 INSTALLATION

A. The louver shall be aligned, connected, and installed as specified and in accordance with the manufacturer's recommendations. A bituminous coat shall be applied to all aluminum surfaces in contact with concrete or masonry.

3.02 TESTING

A. After completion of installation, all louvers with operating dampers, both manually and automatically operated, shall be completely field tested to ensure compliance with these specifications.

END OF SECTION

Schedule 40 05 02.04 – Non Potable Water

Process Service	Pressurized EWH	Wet Weather Pump Seal Water	Non Potable Water
Process Service Identifier	EWH	SLW	NPW

Test Conditions

Process Area	Rated Pressure (psig)	Test Pressure (psig)	Duration (min.)	Medium
Discharge Piping Floor	150	100	120	Water
Motor Floor	150	150	120	Water
Duty Pump Floor	150	150	120	Water

General Requirements

1. Full-Faced flanges mated with raised face flanges are not permitted.
2. Mating flanges for pipe shall be of the same Standard, Class and Series. Mating flanges at valves and equipment shall have specified rating and matching drilling pattern.
3. Threads per ASME B1.20.1.
4. Match metal alloy/grade/type for any metal welded to pipe or fittings. (e.g. Do not weld carbon steel to stainless steel; weld Type 316L to Type 316L pipe material.)
5. Solvent welding of PVC piping performed with Weld-On 724 (ASTM F 493, NSF/ANSI 14, NSF/ANSI 61) or Approved Equal. Universal plastic pipe solvent is not acceptable. Prior to solvent welding, clean pipe joints to remove all loose debris and prime with a compatible primer. Primer shall stain piping.

Notes:

1. Flange bolt length per ASME B16.5 plus three additional threads. Hex head bolt dimensions per ASME B18.2.1. Class 2A standard coarse series threads per ASME B1.1, standard coarse thread series. Hex nut dimensions per ASME B18.2.2 (Heavy Hex). Class 2B standard coarse series threads per ASME B1.1.
2. Provide Long Radius Elbows. Provide full flow fittings. Segmentally welded fittings are not acceptable.

Schedule 40 05 02.04 – Non Potable Water

Process Service	Pressurized EWH	Wet Weather Pump Seal Water	Non Potable Water
Process Service Identifier	EWH	SLW	NPW

3. Provide long radius five cut mitered elbows for segmentally welded fittings.
4. Install lining and coating prior to welding Threadolet or Half Coupling.
5. Provide Concrete Surround for pipe buried below structures.
6. Except at flanged connections at valves, flanged connections/joints not permitted on buried Ductile Iron Pipe.
7. FNPT tap at factory installed tapping boss. Taps at other locations on pipe and fittings are not permitted.
8. Bolts and nuts with metallurgy specified in AWWA C111.
9. Where shown on the drawings, provide stainless steel SLW piping with a radius to mount on the inner diameter of the pump station shaft on the duty pump and motor floors. Bent pipe shall be fitted with PGRV joints and meet the requirements specified in Section 40 05 23.

Indoor Dry, Indoor Wet, Outdoor, Process Corrosive, Headspace, Submerged - Exposed

Component	Line Size, in	Rating	Conn./Joints	Material	Spec Section	Notes
Pipe	1/8 thru 2-1/2	Sch. 40S	TD, PGRV	Stainless Steel: ASTM A312-TP316L, SML, Dim. Per ASME B36.19	40 05 23	9
	3 thru 12	CL 53	FE	Ductile Iron: AWWA C151	40 05 19	2
Lining for Pipe & Fittings	1/8 thru 2-1/2	—	—	None	—	
	3 thru 12	Thk. per Std.	—	Fusion-Bonded Epoxy: See Section 40 05 19 or Liquid Epoxy: See Section 40 05 19.	40 05 19	4
External Coating	1/8 thru 2-1/2	—	—	None	—	4
	3 thru 12	Thk. per Std.	—	Fusion-Bonded Epoxy: See Section 40 05 19 or Liquid Epoxy: See Section 40 05 19.	40 05 19	
Fittings	1/8 thru 1	40 05 23	CJ	Forged Stainless Steel: ASTM A182-F316L	40 05 23	

ADD. NO. 9

ADD. NO. 9

Schedule 40 05 02.04 – Non Potable Water

Process Service	Pressurized EWH	Wet Weather Pump Seal Water	Non Potable Water
Process Service Identifier	EWH	SLW	NPW

Indoor Dry, Indoor Wet, Outdoor, Process Corrosive, Headspace, Submerged - Exposed

Component	Line Size, in	Rating	Conn./Joints	Material	Spec Section	Notes
	1-1/2 thru 2-1/2	Class 3000	TD	Forged Stainless Steel: ASTM A182-F316L, Dim. per ASME B16.11.	40 05 23	2
		Sch. 40S	TD	Wrought Stainless Steel: ASTM A403-WP316L, Dim. per ASME B16.9.	40 05 23	
		Class 150	TD	Cast Stainless Steel: ASTM A351-CF8M, Dim. per ASME B16.3	40 05 23	
	3 thru 12	350 psi	FE	Ductile Iron: ASTM A536-Gr 65/45/12, Dim. per AWWA C110 or AWWA C153	40 05 19	
	3 thru 12	350 psi	FE	Ductile Iron: AWWA C110 or AWWA C153	40 05 19	
Taps	1/2 thru 2-1/2	Class 3000	TD	Forged Stainless Steel Tee: ASTM A182-F316L, Dim. per ASME B16.11	40 05 23	7
		Class 150	TD	Wrought Stainless Steel Tee: ASTM A403-WP316L, Dim. per ASME B16.9.	40 05 23	
		Class 150	TD	Cast Stainless Steel Tee: ASTM A351-CF8M, Dim. per ASME B16.3	40 05 23	
	3 thru 12	Sch. 40	TD	Steel Short Nipple: TYPE 316, Dim. Per ASME B36.10	40 05 19	4
Flanges	3 thru 12	250 psig	FE	Ductile iron: AWWA C115 for pipe, AWWA C110 for fittings, Dim. per ASME B16.1-Class 125	40 05 19	8
FLG Bolts, nuts and hardware	1/8 thru 2-1/2	—	—	Stainless Steel Bolts: ASTM A193 Gr B8M Stainless Steel Nuts: ASTM A194 Gr 8M	—	1

Schedule 40 05 02.04 – Non Potable Water

Process Service	Pressurized EWH	Wet Weather Pump Seal Water	Non Potable Water
Process Service Identifier	EWH	SLW	NPW

Indoor Dry, Indoor Wet, Outdoor, Process Corrosive, Headspace, Submerged - Exposed

Component	Line Size, in	Rating	Conn./Joints	Material	Spec Section	Notes
	3 thru 12	—	—	Non Corrosive, High-Strength, Low-Alloy Steel Bolts: ASTM A 449- Gr 3, Class C or Class D Carbon Steel Nuts: ASTM A563-Gr C3, Class C or Class D Carbon Steel Bolts: ASTM A307-B with Xlyan fluoropolymer coating, Tripac 2000 Blue or approved equal Carbon Steel Nuts: ASTM A563-A with Xlyan fluoropolymer coating, Tripac 2000 Blue or approved equal	—	1
Flange gaskets	3 thru 10	1/16 in Thk	FE	Nitrile or Neoprene	40 05 01	
	12	1/8 in Thk	FE	Nitrile or Neoprene	40 05 01	
Mechanical Coupling Gaskets	3 thru 12	—	—	EPDM	40 05 01	
Compression and Push-On Gaskets	3 thru 12	—	—	Neoprene or Nitrile	40 05 01	
Valves	1/4 thru 2-1/2		TD	Ball: Stainless Steel Body/Ball	40 05 63.03	
	3 thru 12		FE	Resilient Seated Gate Valve: Ductile Iron, AWWA C509 Check Valve, Elastomeric Flap, Spring Closure, Ductile Iron Knife Gate Valve	40 05 61.15 40 05 65.32 40 05 61.43	

Schedule 40 05 02.04 – Non Potable Water

Process Service	Pressurized EWH	Wet Weather Pump Seal Water	Non Potable Water
Process Service Identifier	EWH	SLW	NPW

END OF SECTION

Schedule 40 05 02.43 – Pressurized Wastewater and Drainage

Process Service	Raw Sewage	
Process Service Identifier	RSW	

	Test Conditions		
Process Area	Pressure (psig)	Duration (min.)	Medium
Wet Weather Pump Discharge: Entry Level Floor	75	120	Water
Wet Weather Pump Discharge: Discharge Piping Floor	75	120	Water
Wet Weather Pump Discharge: Pump Level Floor	140	120	Water
Wet Weather Pump Suction: Pump Level Floor & Bottom Floor	100	120	Water
Sump Pump Discharge: Bottom Floor	100	120	Water
Flood Pump Discharge: Bottom Floor	130	120	Water
Flood Pump Discharge: Entry Level Floor / Discharge Chamber	25	120	Water
Recirculation Piping	25	120	Water

General Requirements

1. Full-Faced flanges mated with raised face flanges are not permitted.
2. Mating flanges for pipe shall be of the same Standard, Class and Series. Mating flanges at valves and equipment shall have specified rating and matching drilling pattern.
3. Pipe Threads per ASME B1.20.1.
4. Match metal alloy/grade/type for any metal welded to pipe or fittings. (e.g. Do not weld carbon steel to stainless steel; weld Type 316L to Type 316L pipe material.)

Notes:

1. Flange bolt length per ASME B16.5 plus three additional threads. Hex head bolt dimensions per ASME B18.2.1. Class 2A standard coarse series threads per ASME B1.1, standard coarse thread series. Hex nut dimensions per ASME B18.2.2 (Heavy Hex). Class 2B standard coarse series threads per ASME B1.1.
2. Provide Long Radius Elbows. Provide full flow fittings. Segmentally welded fittings are not acceptable.
3. Provide long radius five cut mitered elbows for segmentally welded fittings.
4. Install lining and coating prior to welding Threadolet or Half Coupling.

Schedule 40 05 02.43 – Pressurized Wastewater and Drainage

Process Service	Raw Sewage	
Process Service Identifier	RSW	

5. Provide Concrete Surround for pipe buried below structures.
6. Except at flanged connections at valves, flanged connections/joints not permitted on buried Ductile Iron Pipe.
7. FNPT tap at factory installed tapping boss. Taps at other locations on pipe and fittings are not permitted.
8. Bolts and nuts with metallurgy specified in AWWA C111.
9. Provide rigid couplings except for pipe installed on pipe racks in below pipe/utility tunnels or chases.

Indoor Dry, Indoor Wet, Outdoor, Process Corrosive, Headspace, Submerged – Exposed, Buried

Component	Line Size, in	Rating	Conn./Joints	Material	Spec Section	Notes	
	4 thru 48	Class 53	RPO, RJ, FE	Ductile Iron: AWWA C151	40 05 19	5	
	4 thru 48	150 psi	FE/PE	Carbon Steel: AWWA C200, Materials: ASTM A53, Type S, Grade B or equivalent. Minimum thickness shall be 0.25 inches.	40 05 24		
Lining for Pipe & Fittings	Ductile Iron, All	Thk. Per Specification.	RPO, RJ, FE	Fusion-Bonded Epoxy: See Section 40 05 19 or Liquid Epoxy: See Section 40 05 19.	40 05 19		ADD. NO. 9
	Carbon Steel, 4 thru 48	Thk. Per Specification	FE	Fusion-Bonded Epoxy: See Section 40 05 24.	40 05 24		
External Coating	Ductile Iron, Interior	Thk. Per Specification	—	Fusion-Bonded Epoxy: See Section 40 05 19 or Liquid Epoxy: See Section 40 05 19.	40 05 19		ADD. NO. 9
	Ductile Iron, Exterior	Thk. Per Specification		Fusion-Bonded Epoxy: See Section 40 05 19. or Liquid Epoxy: See Section 40 05 19.	40 05 19		ADD. NO. 9
	Carbon Steel	Thk. Per Specification		Fusion-Bonded Epoxy: See Section 40 05 24.	40 05 24		
	Stainless Steel	None		None	40 05 23		

Schedule 40 05 02.43 – Pressurized Wastewater and Drainage

Process Service	Raw Sewage	
Process Service Identifier	RSW	

Indoor Dry, Indoor Wet, Outdoor, Process Corrosive, Headspace, Submerged – Exposed, Buried

Component	Line Size, in	Rating	Conn./Joints	Material	Spec Section	Notes
Fittings	Ductile Iron, 3 thru 12	350 psi	RJ, FE	Ductile Iron: ASTM A536-Gr 65/45/12, Dim. per AWWA C110 or AWWA C153	40 05 19	5
	Ductile Iron, 14 thru 48	250 psi	RPO, RJ, FE	Ductile Iron: ASTM A536-Gr 65/45/12, Dim. per AWWA C110 or AWWA C153	40 05 19	5
	Carbon Steel, 4 thru 48		FE	Carbon Steel: Fabricated Carbon Steel, AWWA M11, AWWA C208	40 05 24	
Taps	Ductile Iron, All Carbon Steel, All	Sch. 40	TD	Steel Short Nipple: ASTM A53, seamless-Gr B, Type E or Type S, galvanized, Dim. Per ASME B36.10	40 05 19	7
Flanges	Carbon Steel, All		FE	Carbon Steel: Materials per AWWA C207, Dim. Per AWWA C208	40 05 24	
	Ductile Iron, All	250 psig	FE	Ductile iron: AWWA C115 for pipe, AWWA C110 for fittings, Dim. per ASME B16.1-Class 125	40 05 19	6
	Stainless Steel, All		FE	Stainless Steel: Materials per AWWA C228, Dim. Per AWWA C226.	40 05 23	
FLG Bolts, nuts, and hardware	All	—	—	Non Corrosive, High-Strength, Low-Alloy Steel Bolts: ASTM A 449- Gr 3, Class C or Class D with	—	1, 9
				Carbon Steel Nuts: ASTM A563-Gr C3, Class C or Class D		1
				Carbon Steel Bolts: ASTM A307-B with Xlyan fluoropolymer coating, Tripac 2000 Blue or approved equal with		1
				Carbon Steel Nuts: ASTM A563-A with Xlyan fluoropolymer coating, Tripac 2000 Blue or approved equal		1

Schedule 40 05 02.43 – Pressurized Wastewater and Drainage

Process Service	Raw Sewage	
Process Service Identifier	RSW	

Indoor Dry, Indoor Wet, Outdoor, Process Corrosive, Headspace, Submerged – Exposed, Buried

Component	Line Size, in	Rating	Conn./Joints	Material	Spec Section	Notes
Flange gaskets	3 thru 10	1/16 in Thk.	FE	Nitrile or Neoprene	40 05 01	
	12 thru 72	1/8 in Thk.	FE	Nitrile or Neoprene	40 05 01	

END OF SECTION

SECTION 40 05 19
DUCTILE IRON PIPE

PART 1 GENERAL

1.01 SUMMARY

A. Scope of Section
   1. This Section specifies ductile iron pipe and fittings.

1.02 RELATED SECTIONS

A. Section 31 21 00 – Earthwork, Excavation, Trenching, and Backfilling
B. Section 40 05 01 – Piping Systems
C. Section 40 05 02 – Piping System Schedules
D. Section 40 05 06 – Couplings, Adapters, and Specials for Process Piping
E. Section 40 05 07 – Hangers and Supports for Process Piping
F. Section 40 05 07.13 – Expansion Control for Piping
G. Section 40 05 23 – Stainless Steel Process Pipe and Tubing
H. Section 40 05 24 – Steel Pipe

1.03 REFERENCES

A. This Section contains references to the following documents. Those documents are a part of this Section as specified and modified. In the event of conflict between the requirements of this Section and those of the listed documents, the requirements of this Section shall prevail.

B. Unless otherwise specified, references to documents shall mean the documents in effect at the time of Advertisement for Bids or Invitation to Bid (or on the effective date of the Agreement if there were no Bids). If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, regardless of whether the document has been superseded by a version with a later date, discontinued or replaced.

Reference	Title
ASME B16.1	Cast Iron Pipe Flanges and Flanged Fittings Class 25, 125, and 250
ASME B16.5	Pipe Flanges and Flanged Fittings
ASME B16.42	Ductile Iron Pipe Flanges and Flanged Fittings: Classes 150 and 300

Reference	Title
ASTM B1000	Casting Preparation and Test Procedure of Porcelain Enamel-lined Pipe, Fittings, and Valves for Use in the Municipal Wastewater, Sewage, and Water Treatment Industry
ASTM C150	Portland Cement
ASTM A716	Standard Specification for Ductile Iron Culvert Pipe
AWWA C104	Cement-Mortar Lining for Ductile- Iron and Gray-Iron Pipe
AWWA C105	Polyethylene Encasement for Ductile-Iron Pipe Systems
AWWA C110	Ductile-Iron and Gray-Iron Fittings
AWWA C111	Rubber-Gasket Joints for Ductile- Iron and Gray-Iron Pressure Pipe and Fittings
AWWA C115	Flanged Ductile-Iron and Gray-Iron Pipe with Threaded Flanges
AWWA C116	Protective Fusion-Bonded-Epoxy Coating for the Interior and Exterior Surfaces for Ductile-Iron and Gray-Iron Fittings.
AWWA C150	Thickness Design of Ductile-Iron Pipe
AWWA C151	Ductile-Iron Pipe, Centrifugally Cast
AWWA C153	Ductile-Iron Compact Fittings
AWWA C600	Installation of Ductile-Iron Water Mains and Their Appurtenances.
AWWA C606	Grooved and Shouldered Type Joints
ISO 8179-1	Ductile Iron Pipes – Externa Zinc-based Coating - Part 1: Metallic Zinc with Finishing Layer

1.04 SUBMITTALS

A. Provide the following minimum documentation per Section 01 33 00 – Submittal Procedures.

B. Action Submittals – Preconstruction:

1. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with addendum updates included, with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check-marks (✓) denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The Construction Manager is the final authority for determining acceptability of requested deviations. The remaining portions of the paragraph not underlined will signify compliance with the specifications. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

2. Manufacturer's product data, catalog cuts, dimensions and materials. Indicate each Piping System Schedule where the product will be used.
3. Coating:
    a. Product data, including application procedures.
    b. Documentation of at least two pipe projects constructed in the past 10 years successfully performing under similar service conditions.
    c. The name, telephone number and address of the owner and completion date and location for the project listed above.
    d. The name, telephone number, and address of the firm

C. Informational Submittals: Submit the following minimum submittals for inspection.
1. Certifications indicated in the following documents:
    a. ASTM A716, Sworn Statement Of Inspection And Certification
    b. AWWA C110, Certification Of Inspection And Testing
    c. AWWA C111, Record Of Specified Tests
    d. AWWA C115, Affidavit Of Compliance
    e. AWWA C151, Manufacturer's Statement And Affidavit Of Compliance
    f. AWWA C606, Affidavit Of Compliance

1.05 SHIPMENT AND STORAGE

A. Ship and store products in accordance with Section 01 65 50 – Product Delivery, Storage and Handling.

PART 2 PRODUCTS

2.01 MATERIALS

A. All pipe system materials to be new, free from defects and conforming to the requirements and standards identified in Section 40 05 02 and related sections.

B. Pipe.
1. Provide increased wall thickness where specified on the Drawings.

2.02 PIPE AND FITTING LININGS

A. Provide pipe and fittings with lining as specified in Piping System Schedules in Section 40 05 02.00 through 40 05 02.99. Requirements for each lining type are specified in this Section.
1. Unlined: NOT USED
2. Cement Mortar Lining
    a. Where specified, provide manufacturer standard thickness shop-applied lining of ASTM A150 Portland Cement conforming to AWWA C104.

2.03 PIPE AND FITTING COATINGS

A. Refer to Section 09 90 00 for color requirements.

B. Provide pipe with coating as specified in Piping System Specification Sheets in Section 40 05 02. Requirements for each coating type are specified in this Section.
   1. Asphaltic Coating
      a. Factory applied
      b. Coat pipe and fittings with 1 mil, minimum, of asphaltic material as specified in AWWA C151.
   2. Zinc Coating with Asphaltic Top Coat
      a. Factory applied
      b. Coat pipe and fittings with a layer of arc-sprayed zinc per ISO 8179-1. Zinc applied at not less than 200 g/m^2 of pipe surface area. Apply a finishing layer asphaltic topcoat per AWWA C151.
   3. Polyethylene Encasement
      a. Field installed, Method A.
      b. Encase pipe and fittings in polyethylene wrap as specified in AWWA C105.
      c. Polyethylene wrap/jacket shall be Anti-microbial, Low Density Polyethylene (LDPE) or High Density Polyethylene (HDPE):
         1) LDPE: 8-mil linear low density polyethylene film meeting the requirements of AWWA C105, impregnated with ½ percent NM-100 anti-microbial compound. Fulton Enterprises Biofilm, or Approved Equal.
         2) HDPE: 4-mil high-density, cross-laminated polyethylene film meeting the requirements of AWWA C105.
      d. Seam/Joint Tape – Acceptable manufacturer:
         1) Polyken No. 900 (polyethylene)
         2) Scotchwrap No. 50 (polyvinyl)
         3) Approved equal
   4. V-Bio Enhanced Polyethylene Encasement
      a. Field installed
      b. Encase pipe and fittings in polyethylene tubing as specified in AWWA C105.
      c. Three layer, co-extruded, linear low density polyethylene wrap.
      d. 8 mils minimum wrap thickness
      e. Inner surface of polyethylene wrap infused with anti-microbial biocide and corrosion inhibitor.
      f. Candidate Manufacturers:
         1) Daubert Cromwell
         2) Approved Equal
   5. Polyamidoamine Epoxy Primer
      a. Factory or shop applied
      b. Coat pipe and fittings with Amide or Polyamide cured epoxy, 4 to 8 mils DFT

6. Uncoated
    a. Provide pipe and fittings with a bare metal (no coating) exterior.

2.04 FUSION-BONDED EPOXY LINING AND COATING FOR FITTINGS

A. Refer to Section 09 90 00 for coating color requirements.

B. Fusion Bonded Epoxy lining and coating per AWWA C116.
    1. Fusion-Bonded Epoxy Lining and Coating
        a. Except as described below, the material system for interior of ductile iron pipe shall be in accordance with AWWA C116.
        b. The liner shall be applied to the pipe at a uniform cured thickness. The minimum nominal uniform thickness of the applied material shall be <u>in accordance with AWWA C116 and the manufacturer's recommendations.</u>

ADD. NO 9

            1) Maximum thickness shall be determined by the applicator based on the roughness of the pipe so as to obtain a holiday free product. Lining and coating thickness for pipe joints shall be compatible with dimensional tolerances.
        c. Blast Cleaning: The pipe surfaces to be covered shall be blast-cleaned with steel grit to achieve a near-white surface conforming to SSPC-SP10 or NACE TM-01-70 grade NACE No. 1.
        d. Continuity Tests:
            1) Interior of the pipe shall be electricall inspected for continuity at 2100 volts. At the option of the Construction Manager, if the number of holidays exceeds one per 3 linear feet of pipe 20 inches O.D. or smaller, or one per 2 linear feet of pipe over 20 inches O.D., the pipe shall be reprocessed. If not reprocessed, all defects disclosed by the holiday detector shall be repaired in the shop according to Subsection 3.4 – Coating Repair of the ANSI/AWWA C213 specifications.
            2) Exterior of pipe shall be electrically inspected for continuity at 1965 volts. At the option of the Construction Manager, if the number of holidays exceeds one per 3 linear feet of pipe length for pipe smaller than 14 inches O.D. or one per 25 square feet of surface area for pipe 14 inches O.D. and larger, the pipe shall be reprocessed. If not reprocessed, all defects disclosed by the holiday detector shall be repaired in the shop according to Subsection 3.4 – Coating Repair of the ANSI/AWWA C213 specifications.
        e. Epoxy Manufacturers:
            1) 3m Scotchkote 134
            2) Or Approved Equal
        f. Qualifications, Approval, and Documentation of Fusion Bonded Epoxy Manufacturers
            1) Qualifications: The epoxy manufacturer shall have a record of at least two applications of the proposed coating/lining material on a successfully performing pipe installation of comparable size and complexity constructed in the past 10 years.

2.05 SHOP-APPLIED LIQUID EPOXY COATING AND LINING FOR PIPE

ADD. NO 9

A. The shop-applied liquid epoxy coating for external surfaces or the lining of internal surfaces of the ductile iron pipe shall conform to AWWA C210-15, with additional requirements for cathodic disbondment resistance, and protection of internal linings as specified herein.

B. Coating shall be a two-part, thermosetting liquid epoxy (e.g., amine- or polyamide-cured), applied per AWWA C210 Section 4.4, with a minimum total dry film thickness (DFT) specific to intended usage as listed below:
   1. For internal lining of sewer or other non-potable aggressive fluid streams - 40 mils nominal DFT of Protecto 401 Ceramic epoxy from Induron, or approved equal,
   2. For external coatings - 20 to 25 mils DFT of Ceramawrap Ceramic epoxy from Induron, or approved equal.

C. Protection of Internal Lining
   1. Application Sequence: The approved internal lining shall be fully applied and cured to manufacturer specifications prior to the application of the external AWWA C210 liquid epoxy coating.
   2. End Protection: During external coating application, pipe ends shall be capped, masked, or otherwise sealed to prevent overspray, vapors, or uncured epoxy from entering the pipe interior and contacting the internal lining.
   3. Curing Temperature Limits: The curing process for the external coating shall not subject the internal lining to temperatures exceeding 200°F (93°C) for more than 1 hour, or 250°F (121°C) at any duration, unless the internal lining manufacturer provides written confirmation of higher thermal tolerance. Temperature monitoring of the pipe interior during curing may be required at Owner's discretion if heat curing exceeds 176°F (80°C).
   4. Mechanical Integrity: External surface preparation (e.g., abrasive blasting per NAPF 500 03 04 (2.1) and curing shall minimize vibrational or thermal shock to the internal lining. The manufacturer shall confirm that their standard processes do not compromise the adhesion or integrity of the internal lining, with test data or process documentation provided upon request.

D. Surface Preparation
   1. Prepare ductile iron surfaces per AWWA C210 Section 4.4.2 (SSPC-SP10/NACE No. 2, near-white metal, 1.5–3.0 mil profile), with consideration for preserving the annealing oxide layer unless otherwise directed by the manufacturer.

E. Cathodic Disbondment Resistance
   1. Test Method: Coating shall be tested for cathodic disbondment resistance per ASTM G8-96 (Method A – Immersed), or approved equivalent (such as ASTM G95 with results of disbondment from original radius less than 2mm).
   2. Test Conditions:
      a. Applied potential: -1.5 V vs. $Cu/CuSO_4$ reference electrode.
      b. Electrolyte: 3% NaCl solution.
      c. Temperature: 20°C (68°F) ± 2°C.

d. Duration: 28 days.

e. Intentional holiday: 6 mm (0.25 in) diameter drilled hole through the coating to the substrate.

3. Acceptance Criteria: Maximum disbondment radius from the holiday edge shall not exceed 7 mm, measured as the average of three test specimens. Disbondment shall be assessed per ASTM G8 Section 8 (visual inspection and physical probing).

F. Quality Assurance

1. Manufacturer Certification: Submit test reports from an independent laboratory confirming compliance with the cathodic disbondment criteria prior to coating application.
2. Coating Qualification: Coating system shall meet AWWA C210 adhesion (1,500 psi per ASTM D4541) and holiday-free requirements (ASTM G62) in addition to cathodic disbondment resistance.
3. Field Verification: Coating shall be holiday-tested post-application per AWWA C210 Section 5.2.3 (e.g., high-voltage spark testing at 100 V/mil).

2.06 JOINTS AND COUPLINGS

A. Push-On (PO) Joint (Unrestrained)

1. Rubber ring compression gasket, push-on type joints conforming to AWWA C111.
2. 5 degree deflection at rated operating pressure for joints on 4-inch through 30-inch pipe.
3. Candidate manufacturers:
   a. American Cast Iron Pipe Company Fastite
   b. U.S. Pipe Tyton Joint
   c. Approved equal

B. Restrained Push-On (RPO) Joint

1. Restrained, rubber ring compression gasket, push-on joints conforming to AWWA C111
2. Restrained by the interference of metallic rings, bolts, locking segments or other interlocking components with flanges, lugs, beads, grooves or retainer rings that are integrally cast into or welded onto both ends of the joint. Restrained joints with gripping wedges, or gripping gaskets, radial pads, or other devices that penetrate, grip, or embed in the pipe material to resist axial thrust loads are not acceptable.
3. Candidate manufacturers:
   a. American Cast Iron Pipe Company, Flex-Ring or Lok-Ring
   b. U.S. Pipe, HDSS
   c. Approved equal

C. Mechanical Joint (MJ)

1. Mechanical Joints per AWWA C110 and AWWA C111

D. Restrained Mechanical Joint (RMJ)

1. Restrained by tie-rods/bolts tying the gasket gland to a second retainer/follower gland behind a welded ring on the spigot end of the joint. Restrained joints with gripping

wedges, or gripping gaskets, radial pads, or other devices that penetrate, grip, or embed in the pipe material to resist axial thrust loads are not acceptable.

2. Fully restrained mechanical joints for above or below ground service conforming to AWWA C110 and AWWA C111.
3. Candidate manufacturers:
   a. American Cast Iron Pipe Company, Mechanical Joint Coupled Joint
   b. U.S. Pipe, BOLT-LOK or MECH-LOK
   c. Approved equal

E. Grooved couplings (CGRV) and fittings
1. Cast or cut groove dimensions per AWWA C606
2. Flexible or Rigid Couplings as specified in the Piping System Schedules (Sections 40 05 02.00 through 40 05 02.99).
3. When pipe wall thickness does not meet the minimum requirements of AWWA C606 for rolled or cut groove joints, provide shouldered ends per the requirements of AWWA C606.
4. Candidate manufacturers:
   1) Victaulic
   2) Gruvlok
   3) Approved equal
5. Grooved end flanged coupling adapters candidate manufacturers:
   a. Victaulic Style 341
   b. Approved equal
6. Grooved end transition couplings to steel pipe candidate manufacturers:
   a. Victaulic Style 307
   b. Approved equal

F. Ring Joint Coupling (RJC):
1. Circumferential coupling segments bolted together to engage shouldered end or ring adpapters. Groove dimensions per coupling manufacturer's requirements.
2. Flexible or Rigid Couplings as specified in the Piping System Schedules (Sections 40 05 02.00 through 40 05 02.99).
3. When pipe wall thickness does not meet the minimum requirements for the specified groove joint(s), provide shoulder ends or ring adapters welded to pipe ends.
4. Candidate manufacturers:
   a. Victaulic Vic-Ring
   b. Approved equal

G. Bell and Ball Spigot Flexible (BABS) Joint
1. Boltless type with retainer lock to prevent rotation after assembly
2. Up to 15 degrees of deflection at operating pressure
3. Candidate manufacturers:
   a. Flex-Lok Joint by American Cast Iron Pipe

b. USIFlex by US Pipe
c. Approved equal

H. Sleeve/Transition Coupling
1. When connecting new ductile iron piping to existing piping, field verify outside diameters of existing pipe prior to connection. See drawings for location and installation requirements.
2. Candidate Manufacturers:
a. Romac, "501"
b. JCM, "212"
c. Smith-Blair, "461"
d. Approved equal

I. Flanged Transition to Steel Pipe
1. Where transitioning from/to Steel Pipe specified in Section 40 05 24, provide insulating flange in accordance with Section 40 05 06.

PART 3 EXECUTION

3.01 INSTALLATION

A. General:
1. Follow piping routes specified on the drawings as closely as possible.
2. Install pipe in accordance with AWWA C600.
3. Make connections to existing structures and manholes so that the finished work will conform as nearly as practicable to the requirements specified for new manholes, including necessary concrete work, cutting and shaping. Shape concrete mortar within any structure and manhole as specified.

B. Insulating Sections: Where a metallic nonferrous pipe/appurtenance connects to ferrous pipe/appurtenance, provide an insulating section per Section 40 05 06.

C. Anchorage: Provide as specified on the Drawings.

3.02 REPAIR/RESTORATION

A. Per Section 40 05 01.

B. Repairs for Shop-Applied Liquid Epoxy Coating
1. Shop-applied liquid epoxy coating on ductile iron pipe shall conform to AWWA C210 and repair procedures as specified herein to ensure coating integrity. This specification applies to all pipe, fittings, and assembled joints after delivery and construction site handling.

ADD. NO 9

2. Defect Repair:
a. Follow Manufacturer's instructions.
b. Use a two-part liquid epoxy repair material identical to or manufacturer-approved as compatible with the shop-applied coating per AWWA C210 Section 4.5.

3. Verification Documentation: Maintain pipe markings and production checklist to demonstrate no joints or components missed during the workflow and ensure records available upon request for QA review.
4. Pipe shall not be installed until all holiday testing, repairs, and verification are completed.
5. Protect repaired areas during lowering using slings, padded supports, or equivalent per AWWA C600 to prevent damage.

3.03 COMPONENT TEST PHASE

A. Buried Piping: Test hydrostatic pressure in accordance with Section 5 of AWWA C600, using the test pressures and allowable leakage specified in Section 40 05 01.

B. Exposed and Concrete Encased Piping: Conduct hydrostatic pressure tests in accordance with Section 40 05 01.

3.04 POLYETHYLENE ENCASEMENT

A. Install polyethylene as specified in AWWA C105 and within this Section.

B. Wrapping:
1. Wrap buried pipe, fittings, valves, and couplings.
2. Prior to the placing of concrete, wrap fittings that require concrete backing.
3. Wrap the polyethylene tube seams and overlaps and hold in place by means of a 2-inch-wide plastic backed adhesive tape.
4. The tape shall be such that the adhesive shall bond securely to both metal surfaces and polyethylene film.
5. Bedding and initial backfill for polyethylene wrapped pipe shall be a well-graded granular material to avoid cutting or damaging the polyethylene tube during placement and backfilling. Refer to Section 31 21 00 for bedding and backfill requirements.

END OF SECTION

ATTACHMENT – B

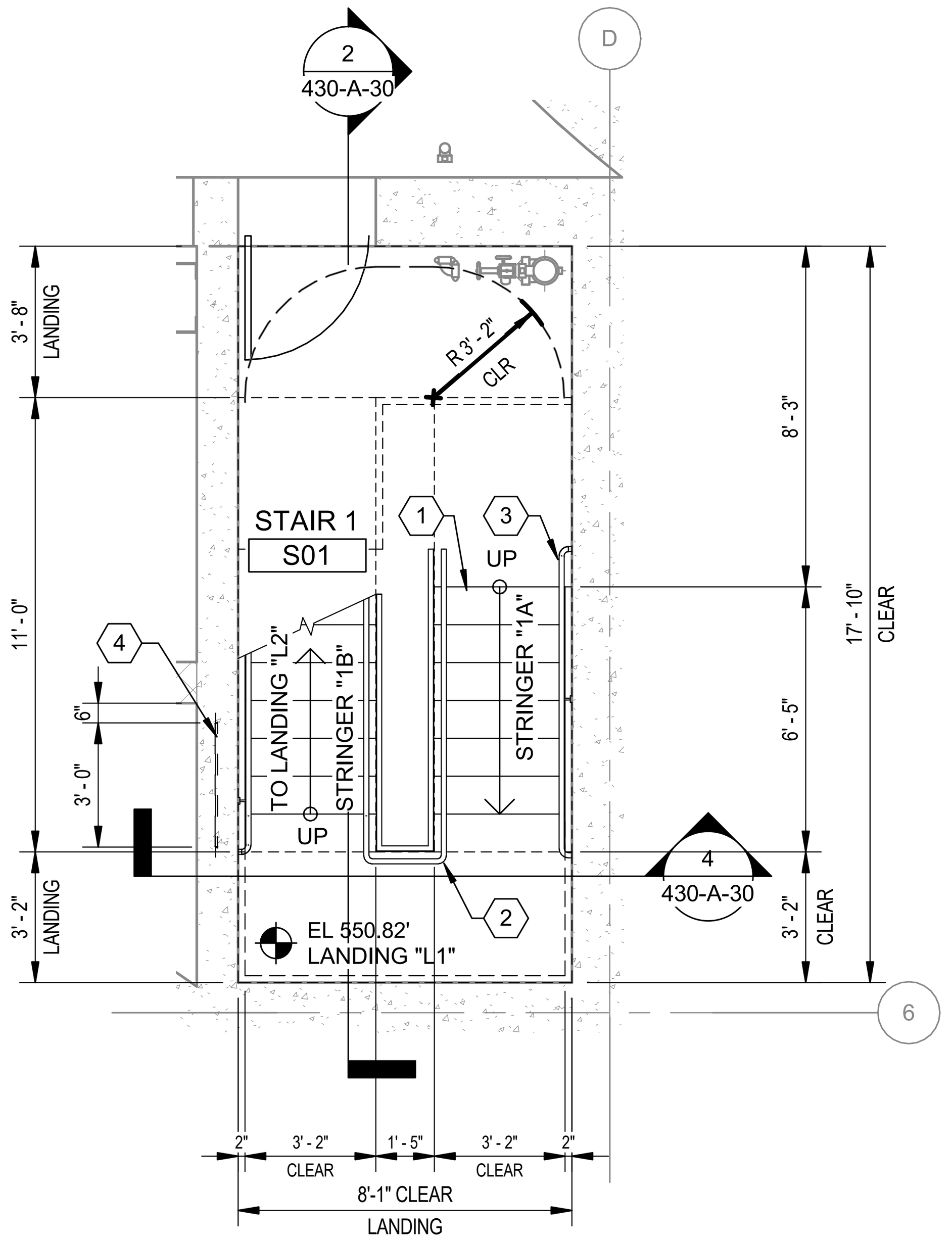
Addendum No. 9 Drawings

GENERAL NOTES:

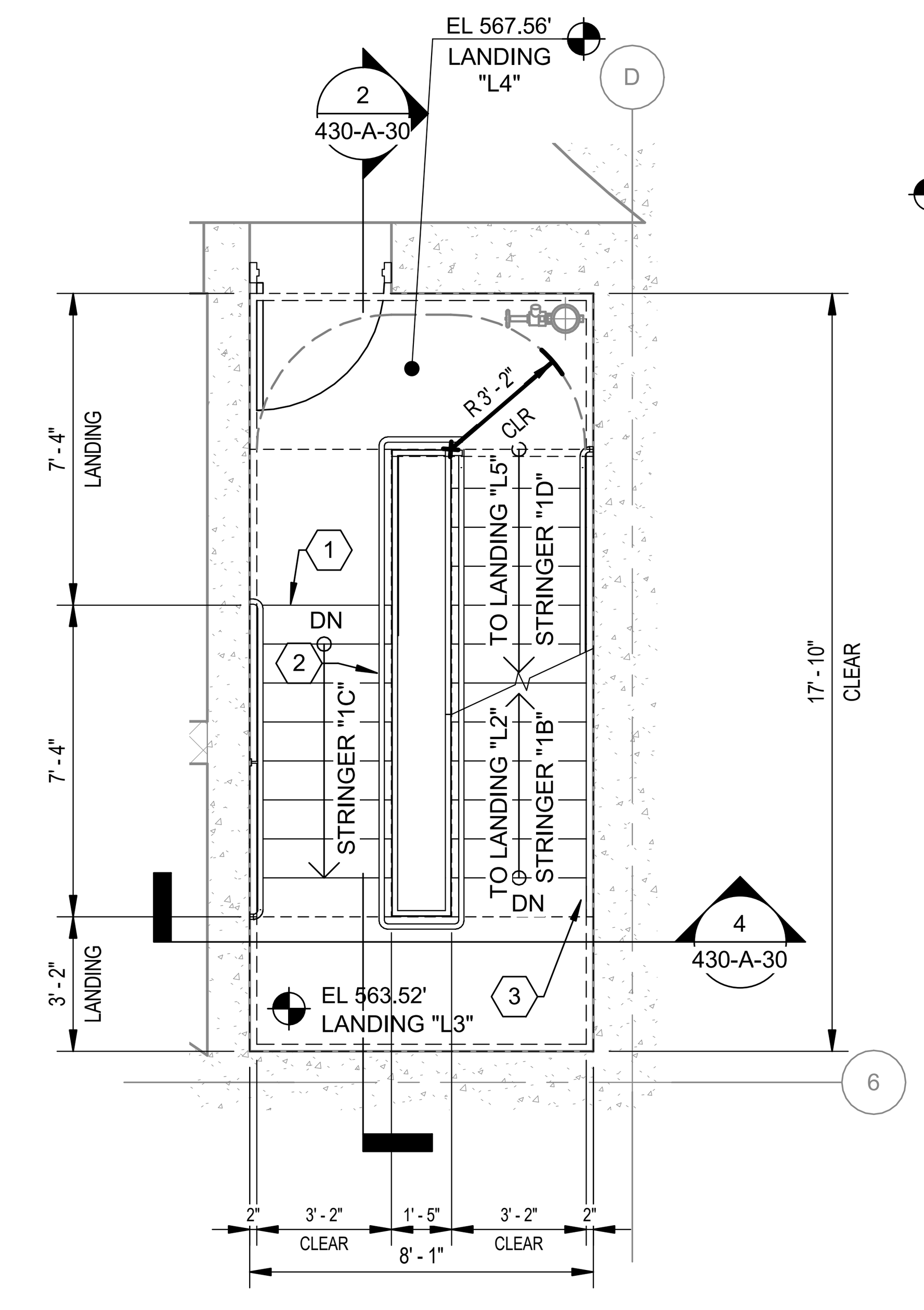
1. ALL STEEL ASSOCIATED WITH STAIR CONSTRUCTION TO BE GALVANIZED

KEYNOTES:

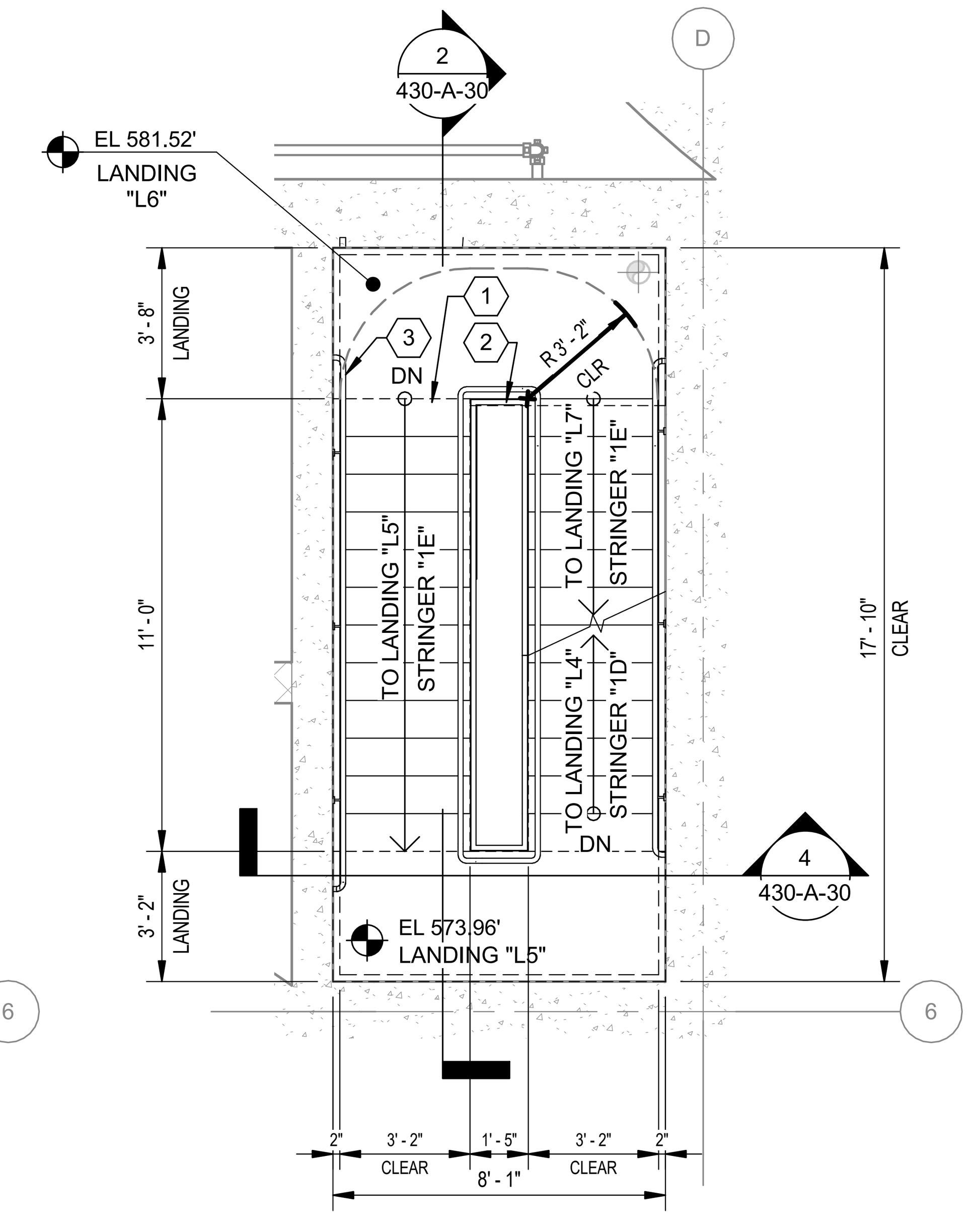
1. METAL STAIR FRAMING SYSTEM WITH CONCRETE PAN TREADS & LANDING DESIGNED BY CONTRACTOR. SEE SHEET 430-A-30 STRINGER SCHEDULE FOR TREAD AND RISER INFORMATION.
2. 42" HIGH METAL GUARDRAIL WITH 34" HIGH METAL HANDRAIL ABOVE TOP OF FINISHED TREAD NOSING. EXTEND 34" HIGH HANDRAIL 11" MIN PAST TOP AND BOTTOM STAIR TREAD NOSING
3. 34" HIGH WALL MOUNTED HANDRAIL ABOVE TOP OF FINISHED TREAD NOSING WITH 11" MIN TOP AND BOTTOM EXTENSION PAST STAIR TREAD NOSING
4. 36" X 36" 2-HOUR RATED SS ACCESS HATCH, SILL AT 16"
5. ELEVATOR ACCESS DOOR. TYPICAL LOCATION FOR ALL ELEVATOR ACCESS DOORS



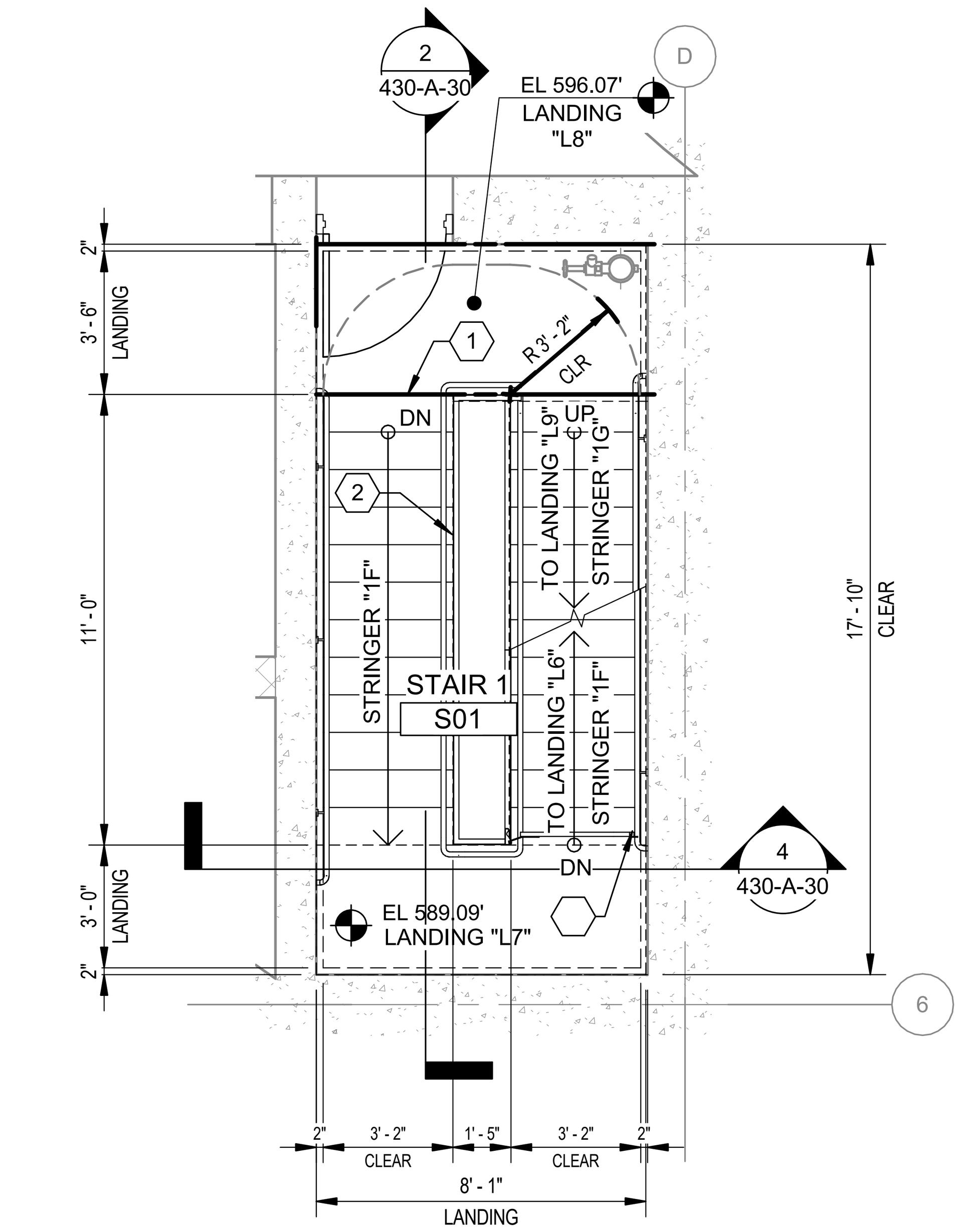
1 STAIR 1 - BOTTOM FLR PLAN



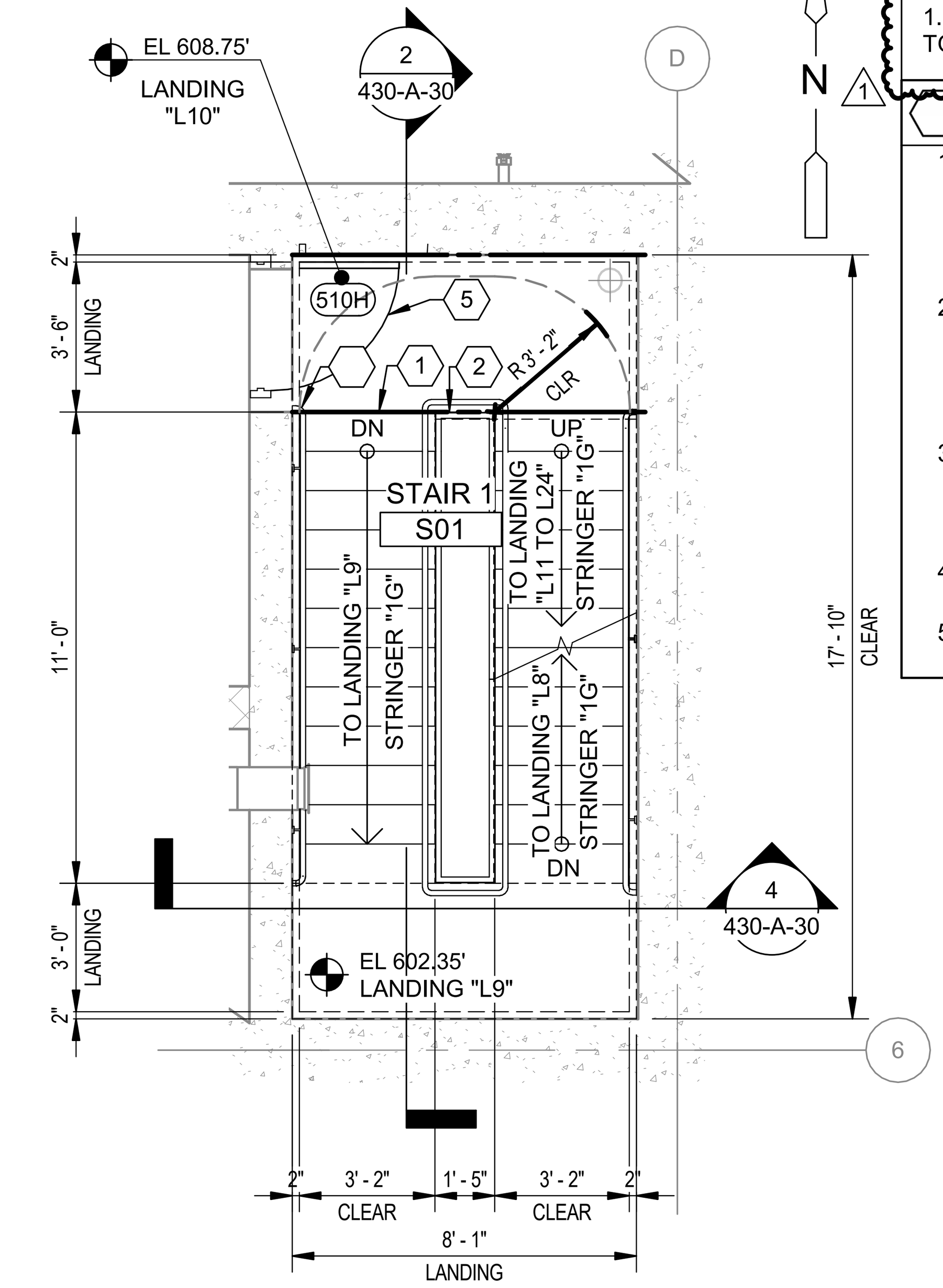
2 STAIR 1 - HEAVY DUTY PUMP FLR PLAN



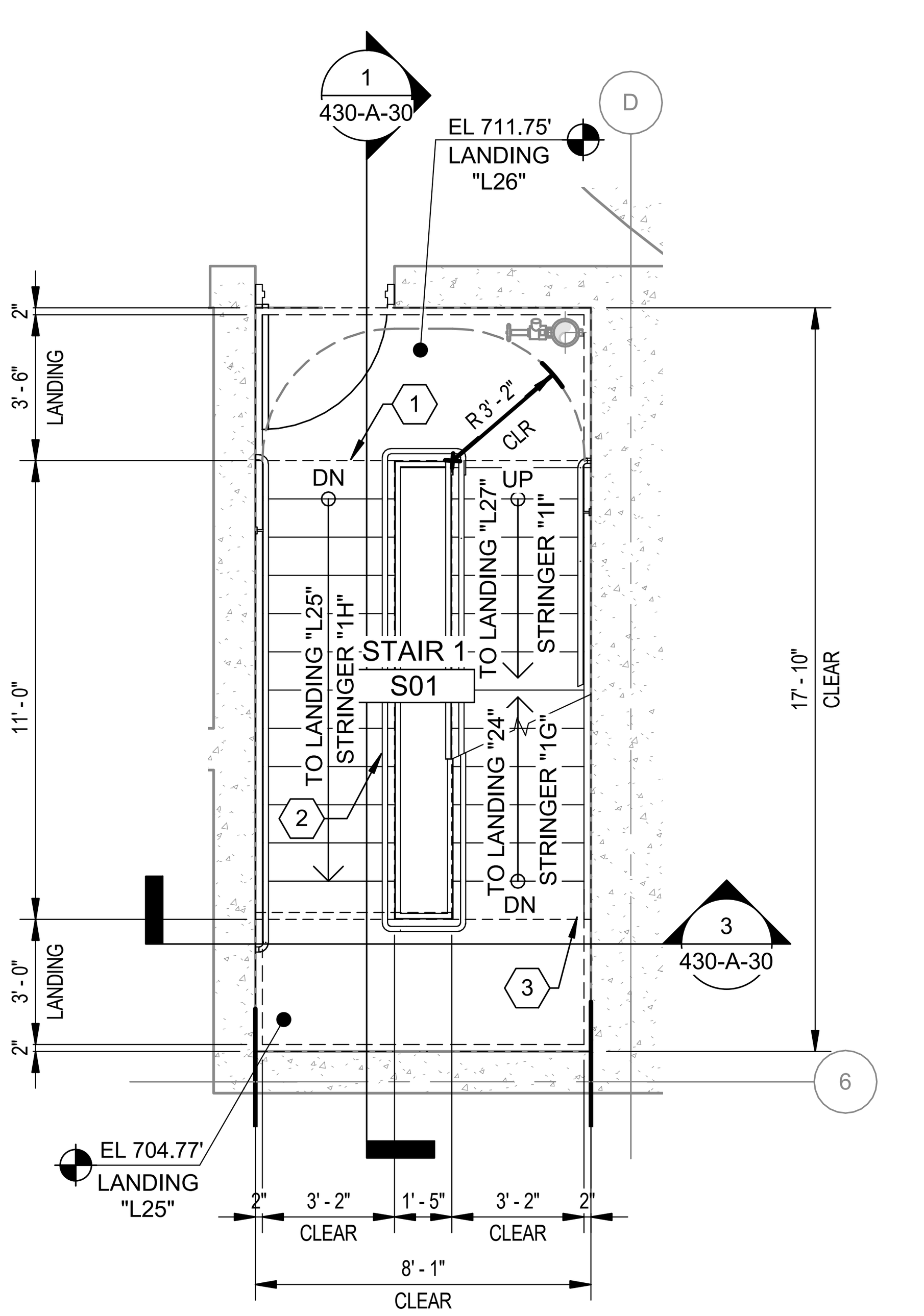
3 STAIR 1 - EL 581.45' FLR PLAN



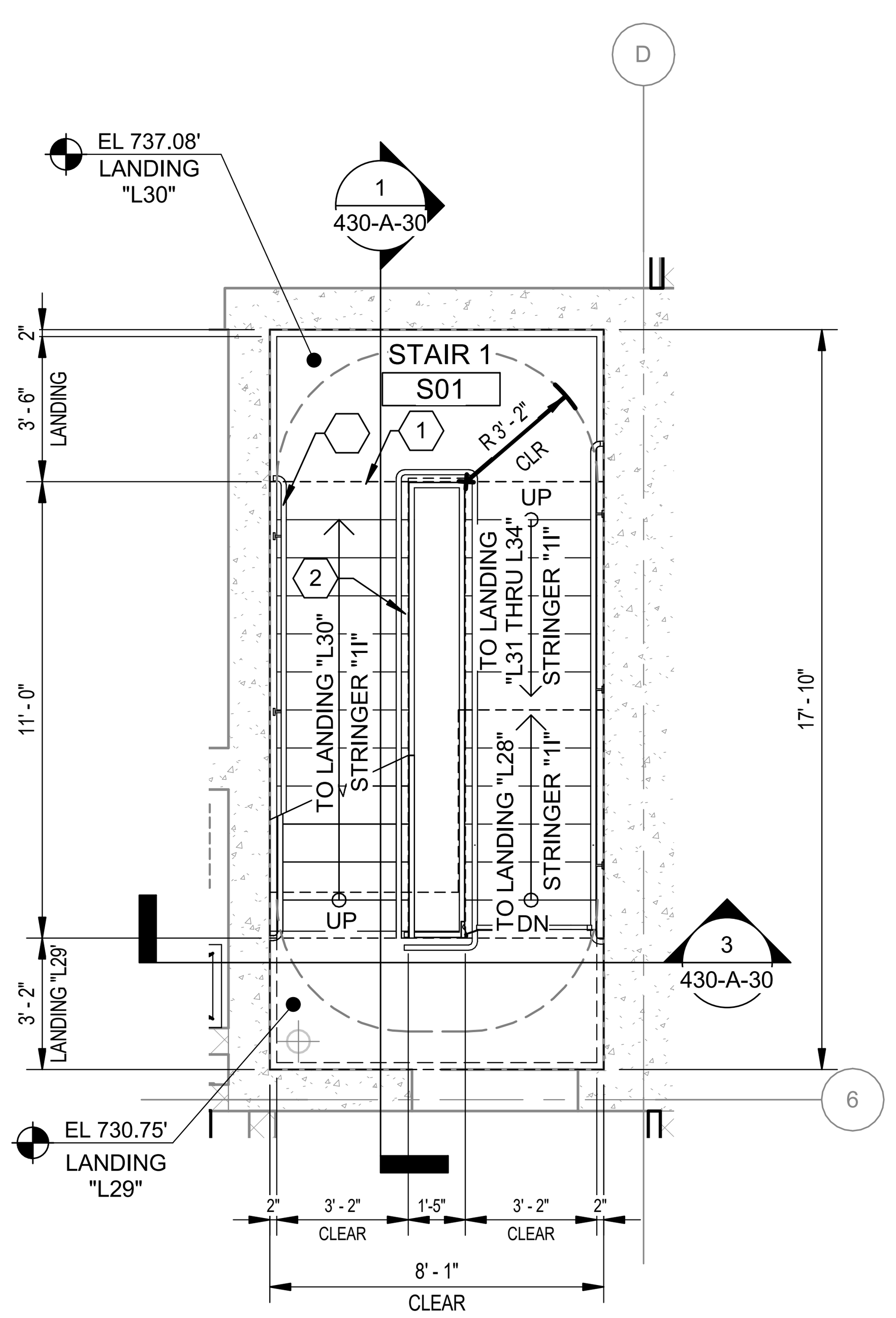
4 STAIR 1- MOTOR FLOOR PLAN



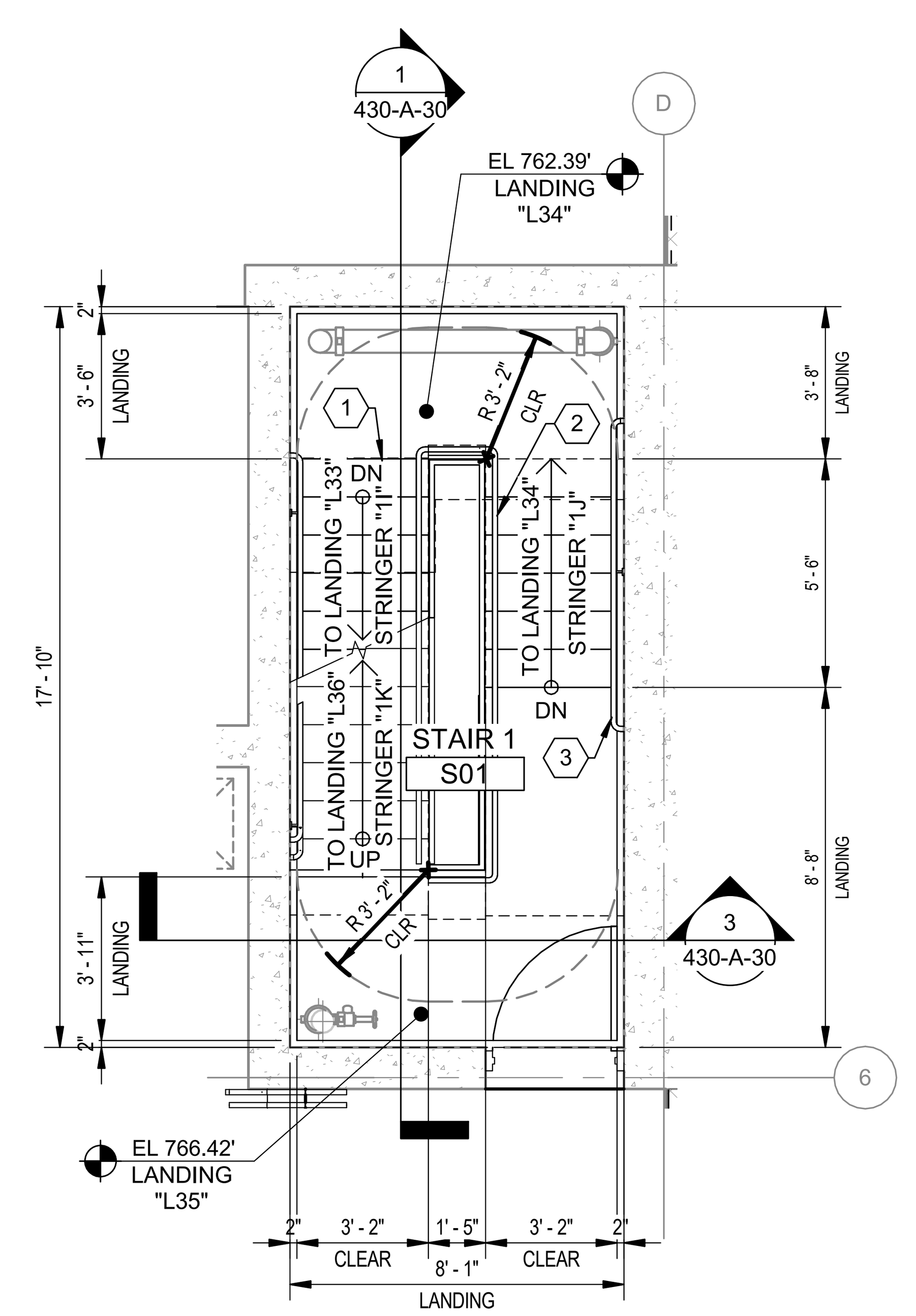
5 STAIR 1- EL 608.75' FLR PLAN



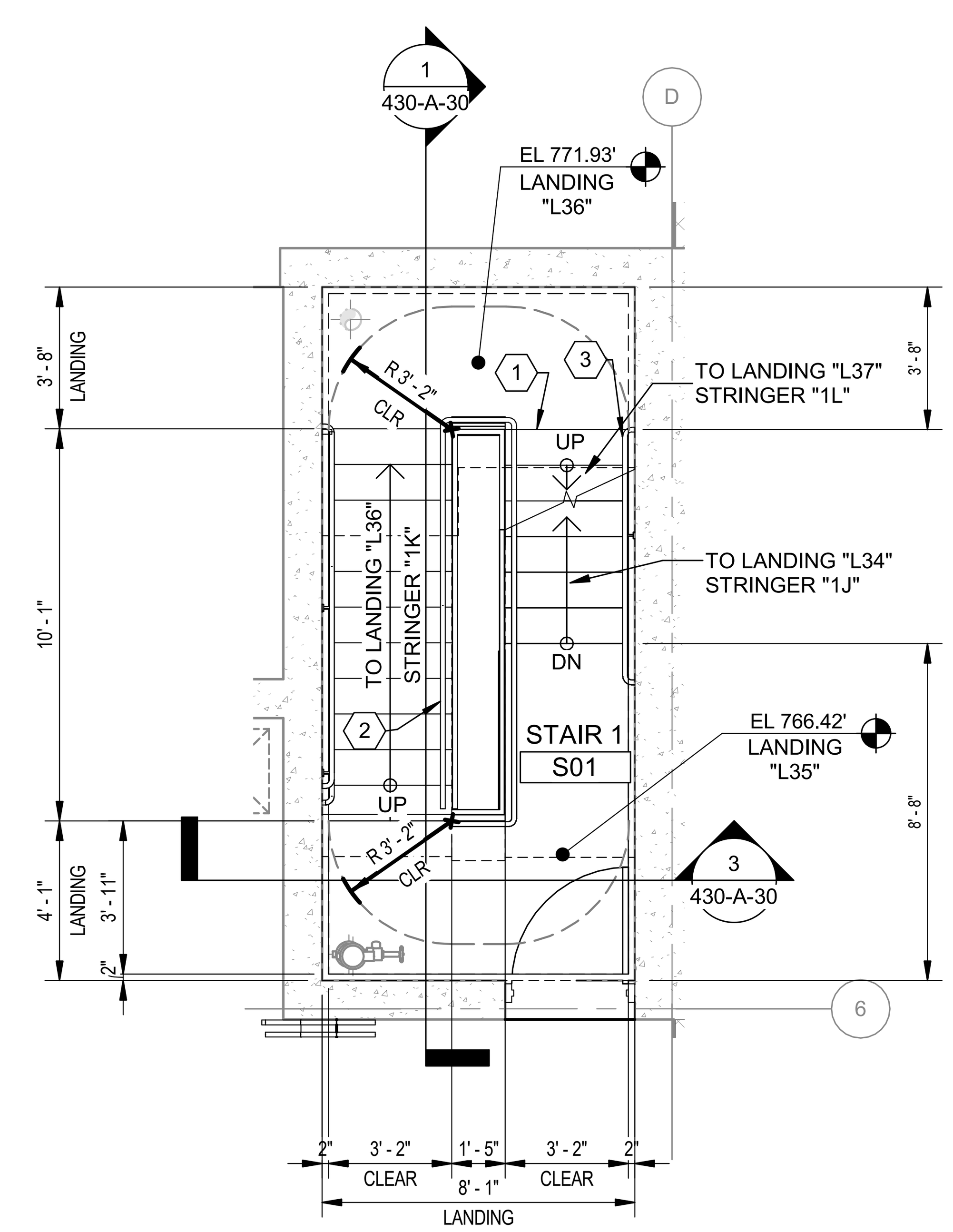
6 STAIR 1 - DISCHARGE PIPING FLR PLAN



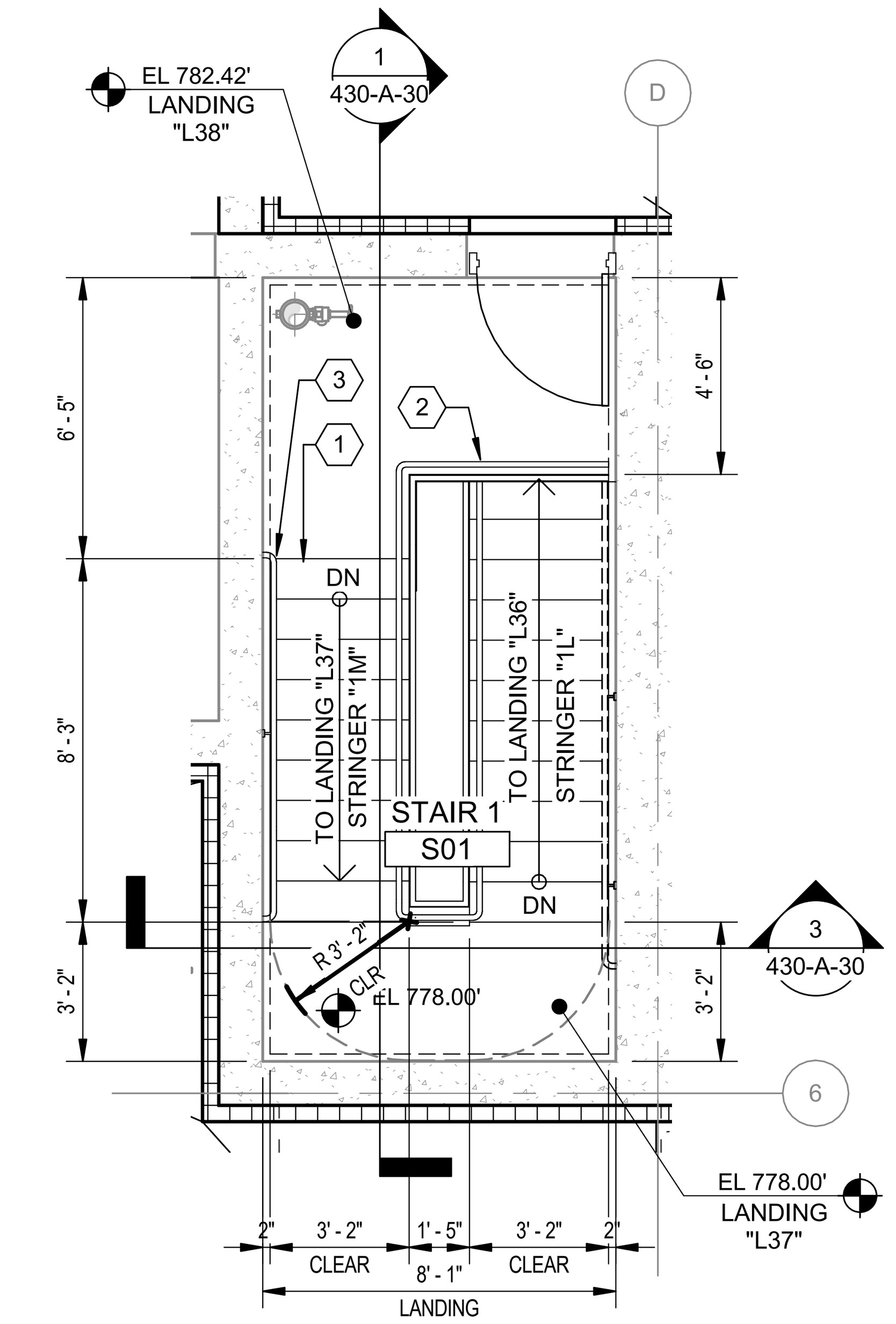
7 STAIR 1 - ENTRY LEVEL FLR PLAN



8 STAIR 1 - ELECTRICAL AND HVAC FLR PLAN



9 STAIR 1 - EL 777.70 FLR PLAN



10 STAIR 1 - ROOF PLAN

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

Designed by:	M.CONTI
Drawn by:	S.GRAMKOW
Checked by:	D.WALDROP

REVISION

REV No.	DATE	DESCRIPTION	APPV
0	5/16/25	ISSUE FOR BID	CKM
1	08/15/25	ADD. 9 - REVISED STAIR MATERIAL TO GALVANIZED	CKM

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ARLETTA SCOTT WILLIAMS
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ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-A-12
STAIR PLANS 1

Contract: 1800
CAD File Name:
Date: 5/16/2025
Sheet: 63 of 405

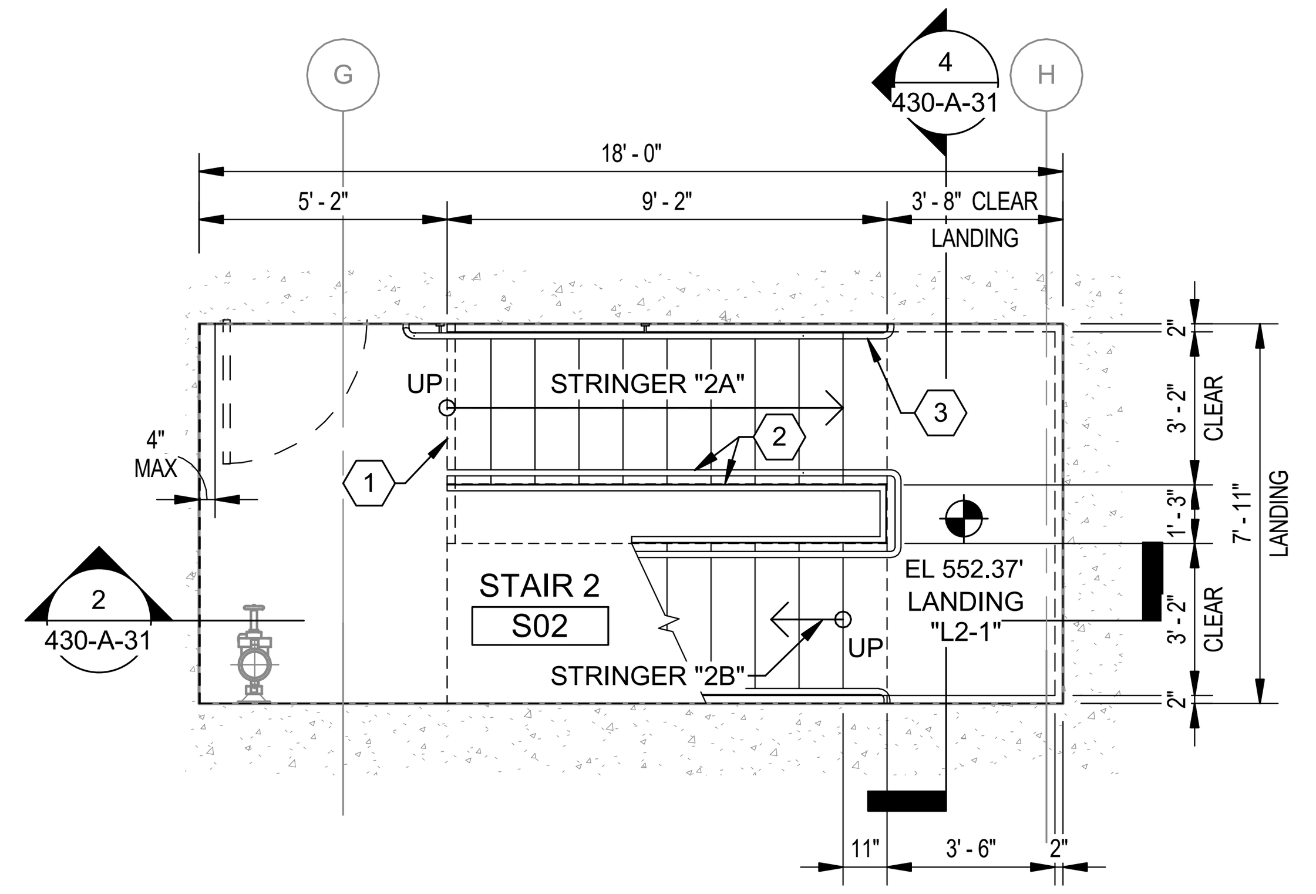
Plot Date: 8/13/2025 10:31:42 AM Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt

GENERAL NOTES:

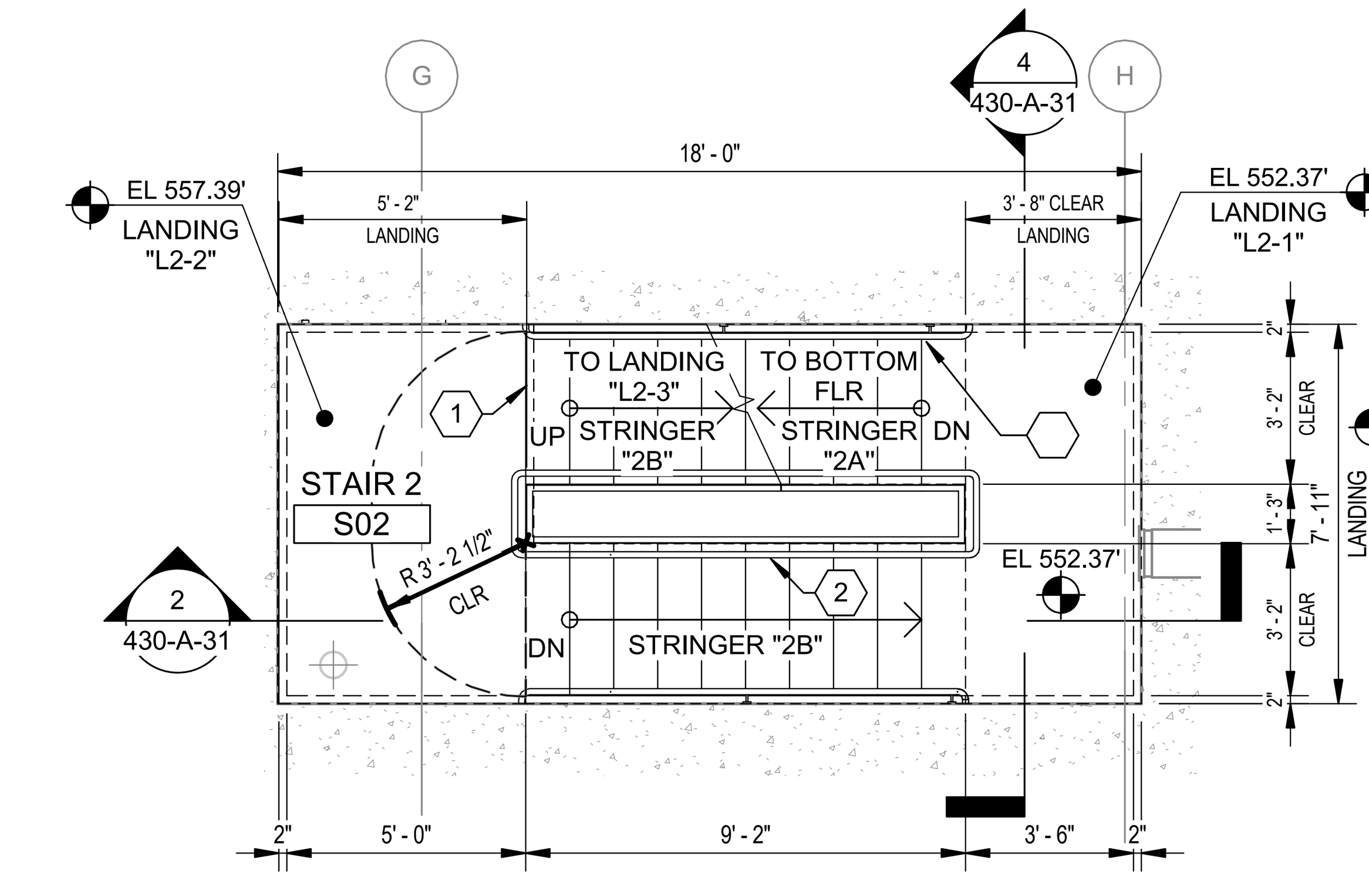
1. ALL STEEL ASSOCIATED WITH STAIR CONSTRUCTION TO BE GALVANIZED

KEYNOTES:

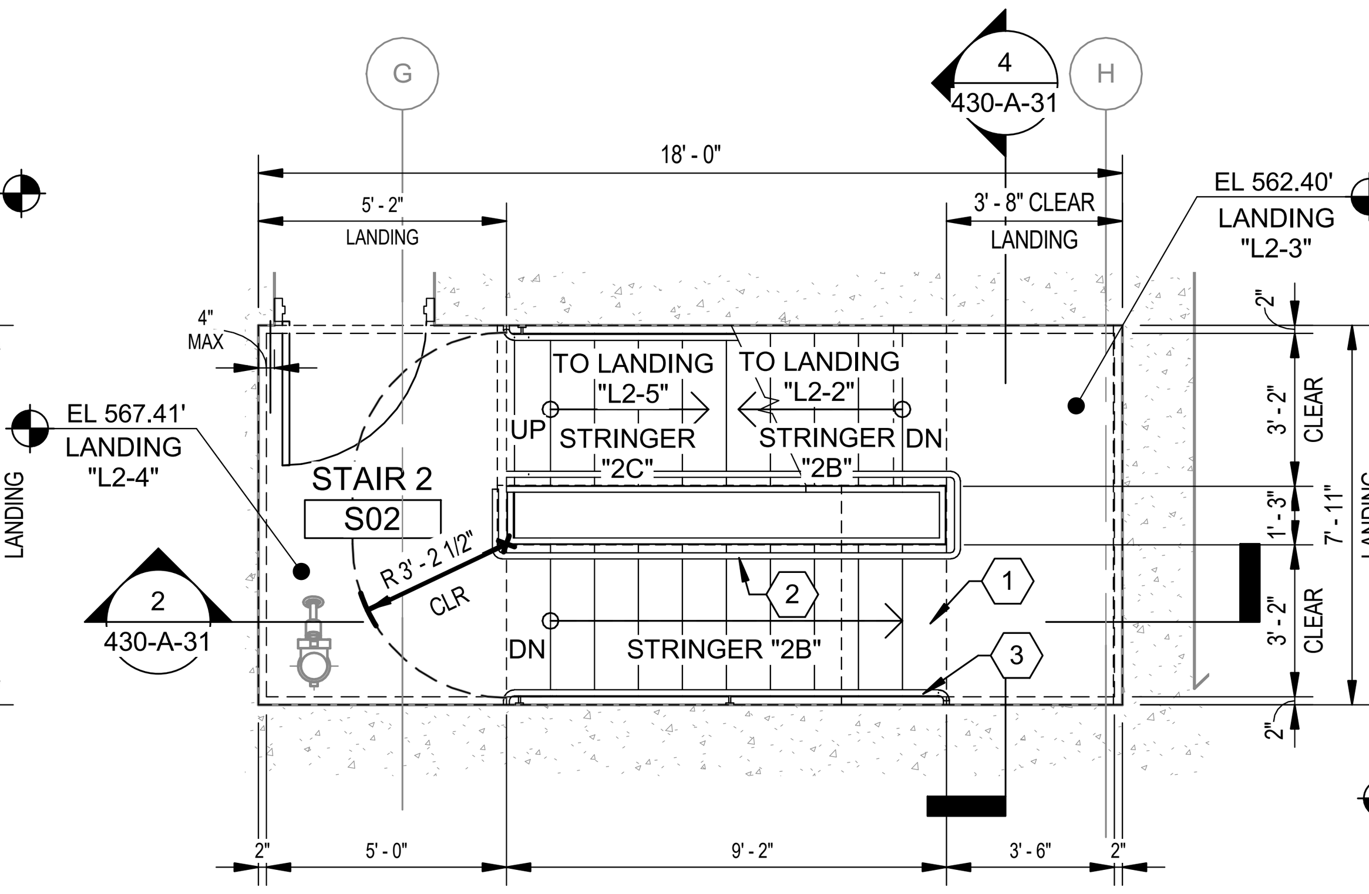
1	METAL STAIR FRAMING SYSTEM WITH CONCRETE PAN TREADS & LANDING DESIGNED BY CONTRACTOR. SEE SHEET 430-A-30 STRINGER SCHEDULE FOR TREAD AND RISER INFORMATION.
2	42" HIGH METAL GUARDRAIL WITH 34" HIGH METAL HANDRAIL ABOVE TOP OF FINISHED TREAD NOSING. EXTEND 34" HIGH HANDRAIL 11" MIN PAST TOP AND BOTTOM STAIR TREAD NOSING
3	34" HIGH WALL MOUNTED HANDRAIL ABOVE TOP OF FINISHED TREAD NOSING WITH 11" MIN TOP AND BOTTOM EXTENSION PAST STAIR TREAD NOSING
4	42" HIGH GUARDRAIL



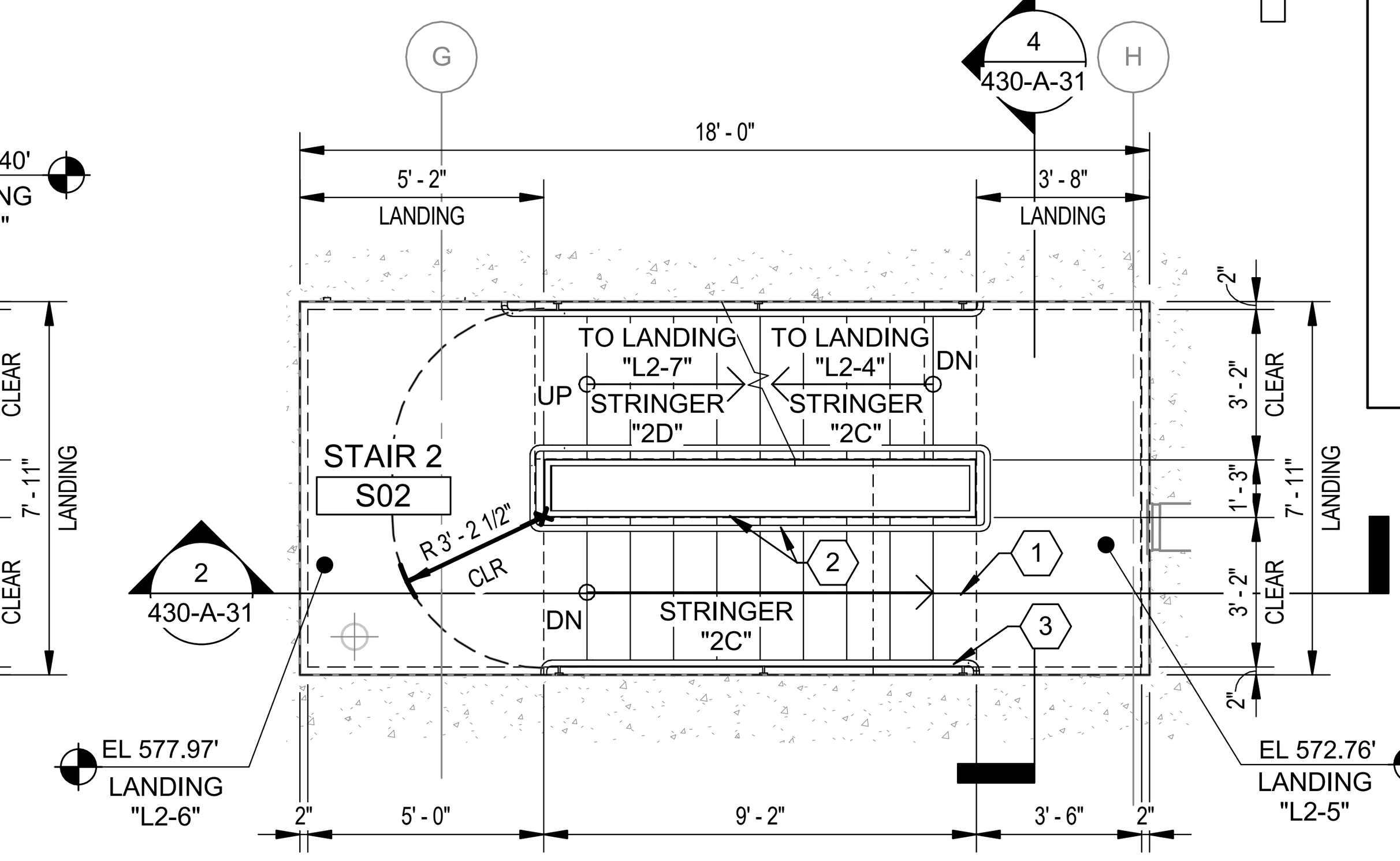
1 STAIR 2 - BOTTOM FLOOR PLAN
SCALE: 1/4" = 1'-0"



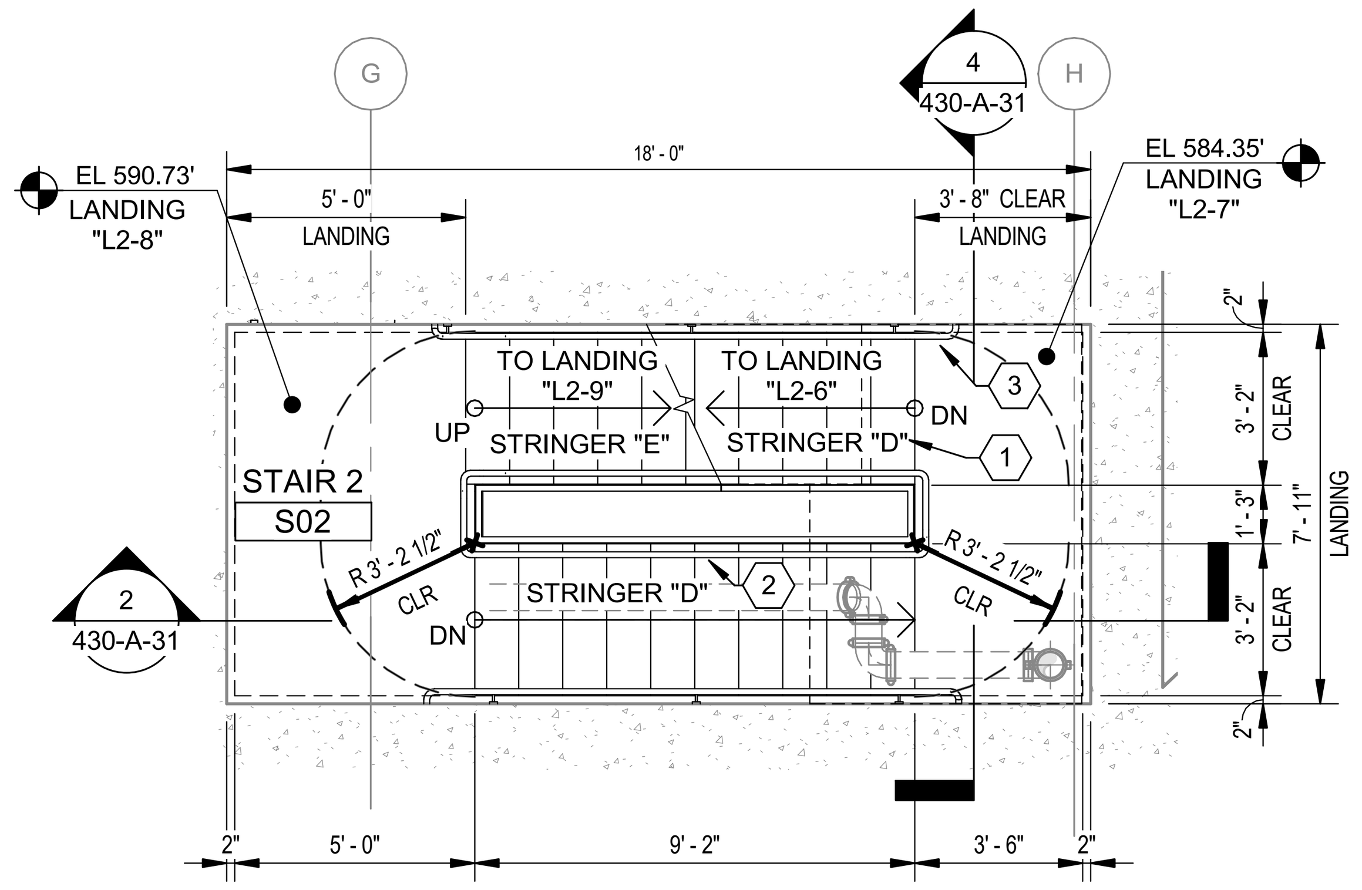
2 STAIR 2 - ELEVATION 557.16' FLOOR PLAN
SCALE: 1/4" = 1'-0"



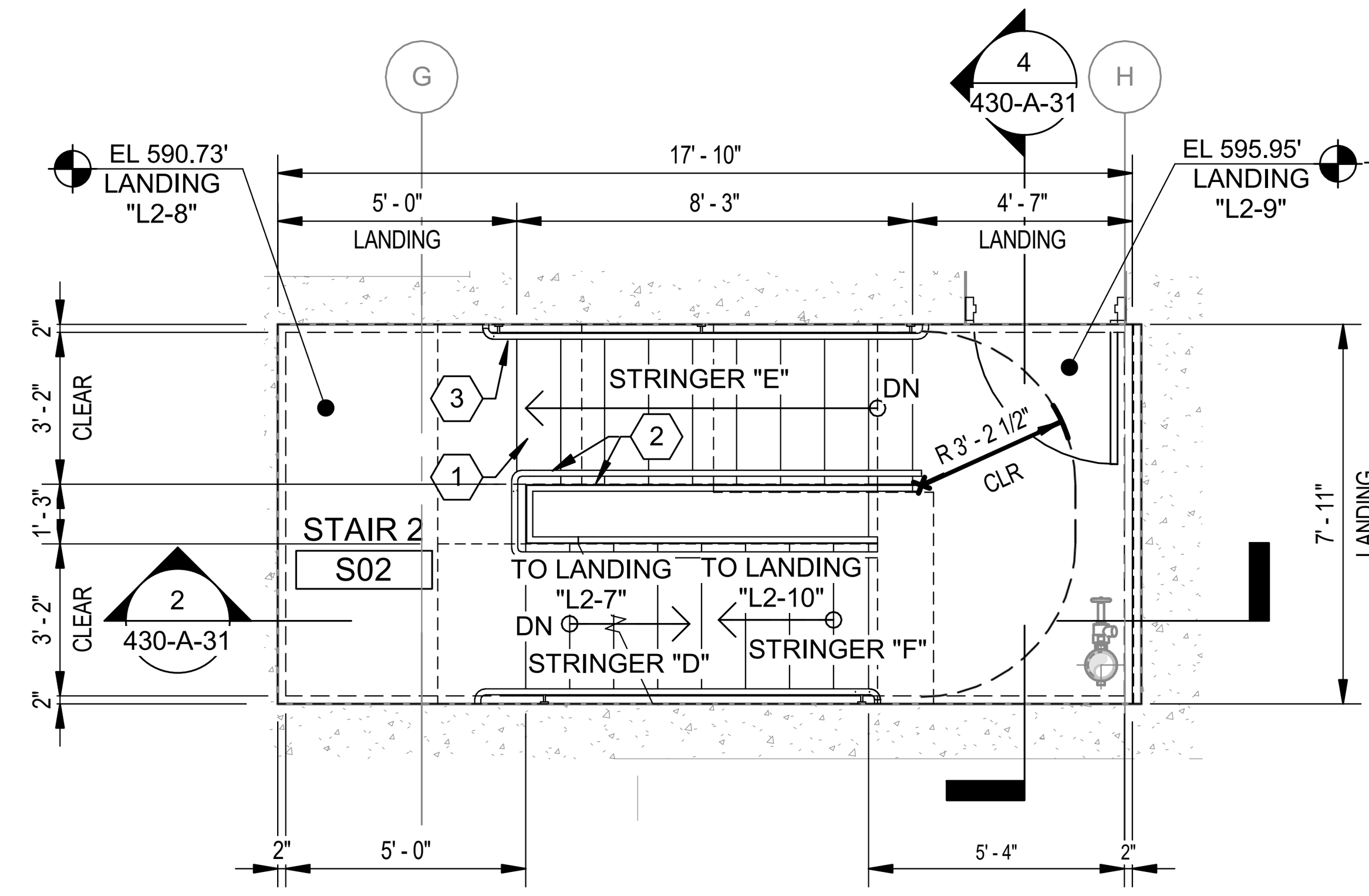
3 STAIR 2 - HIGH DUTY PUMP FLOOR PLAN
SCALE: 1/4" = 1'-0"



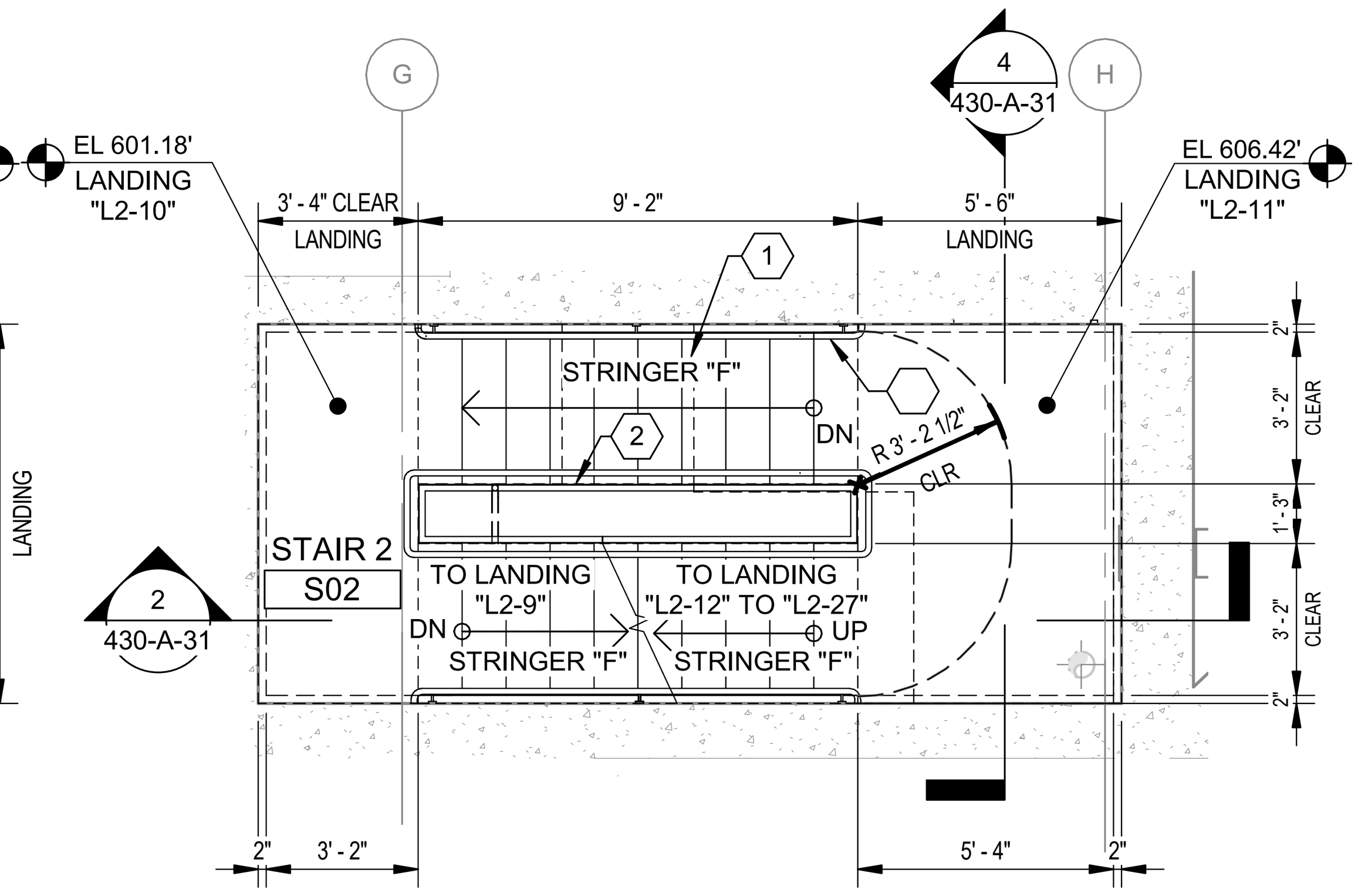
4 STAIR 2 - ELEVATION 577.97' FLOOR PLAN
SCALE: 1/4" = 1'-0"



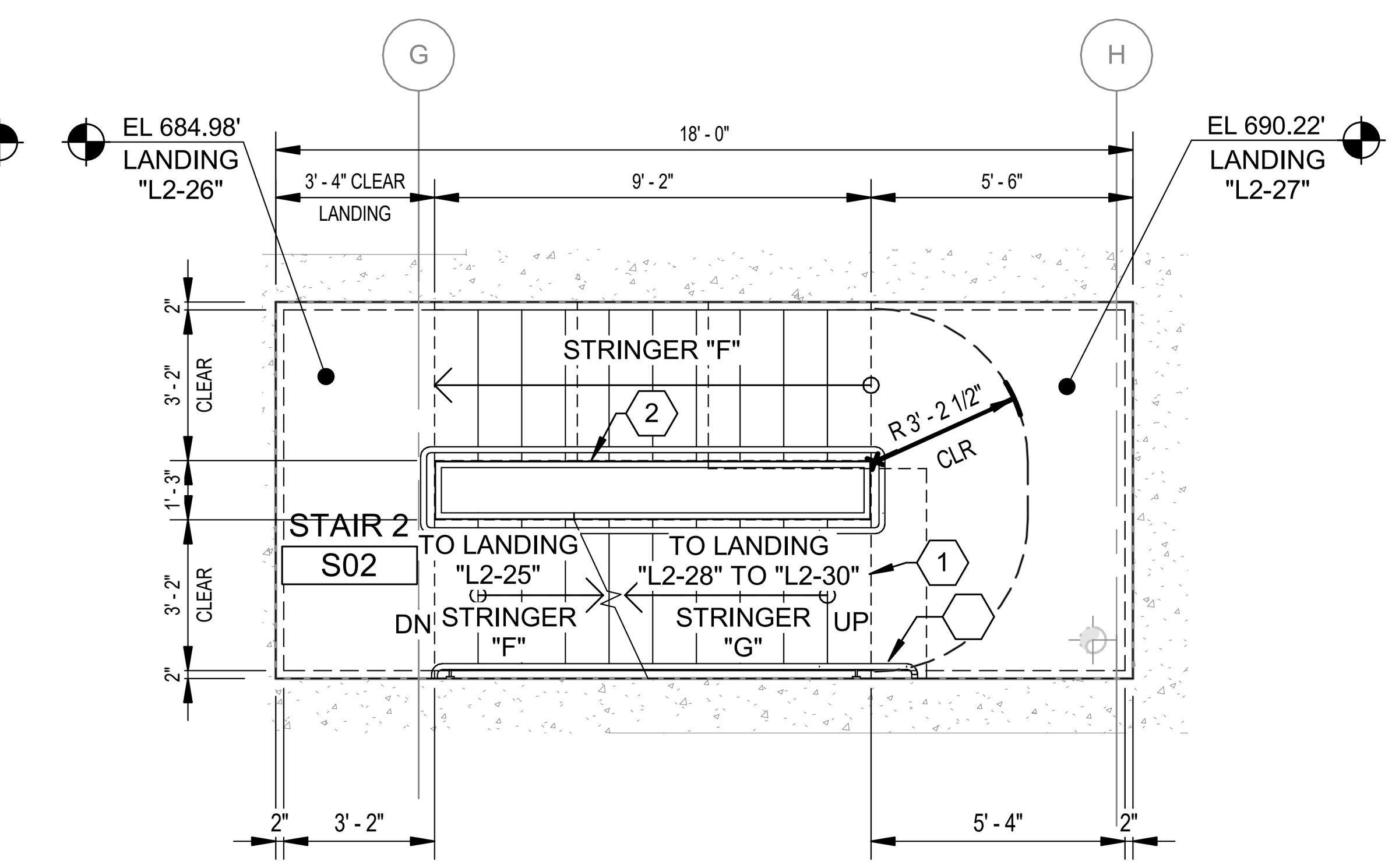
5 STAIR 2 - ELEVATION 590.73' FLOOR PLAN
SCALE: 1/4" = 1'-0"



6 STAIR 2 - MOTOR FLOOR PLAN
SCALE: 1/4" = 1'-0"



7 STAIR 2 - ELEVATION 606.42' FLOOR PLAN
SCALE: 1/4" = 1'-0"



8 STAIR 2 - ELEVATION 690.22' FLOOR PLAN
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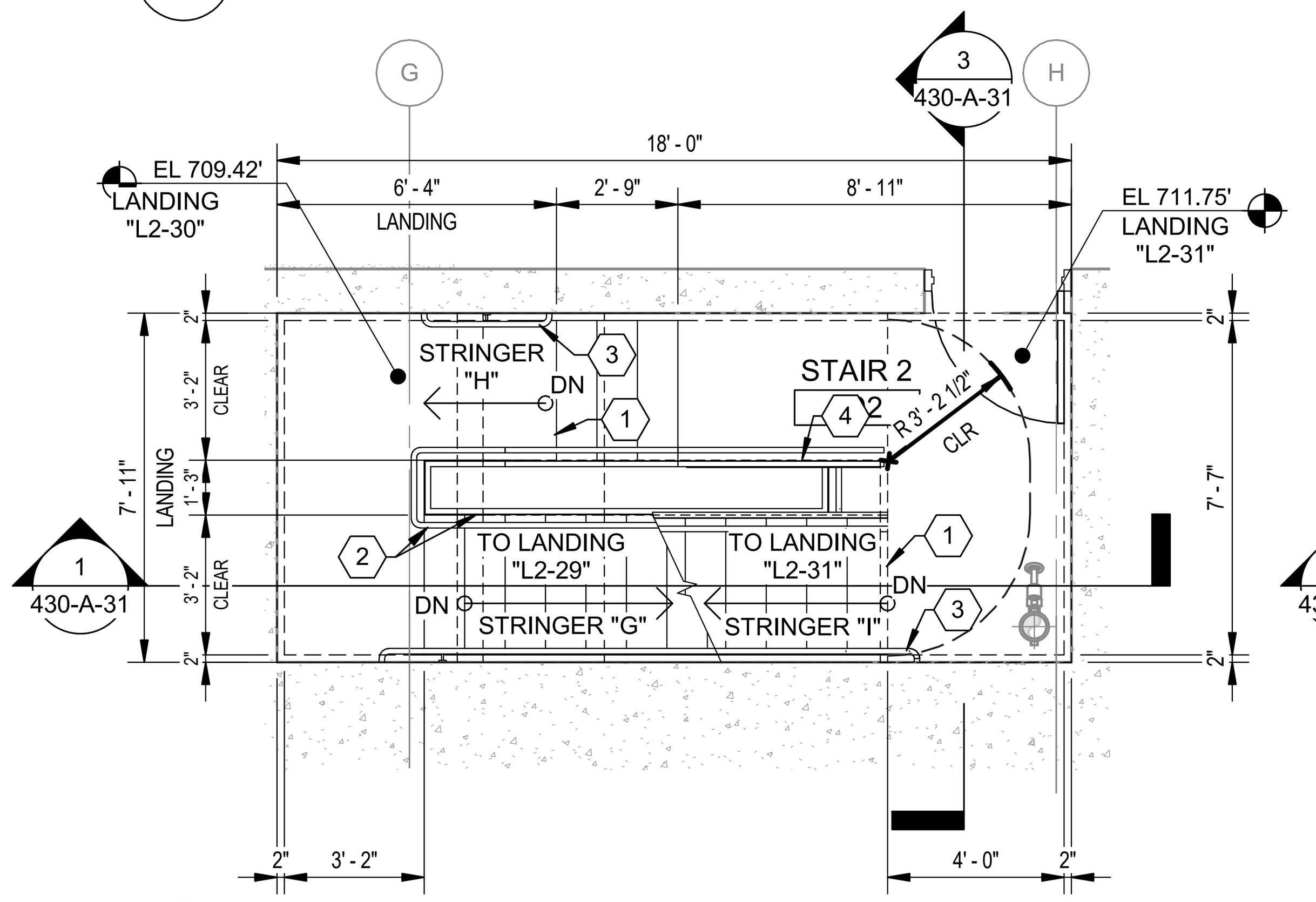
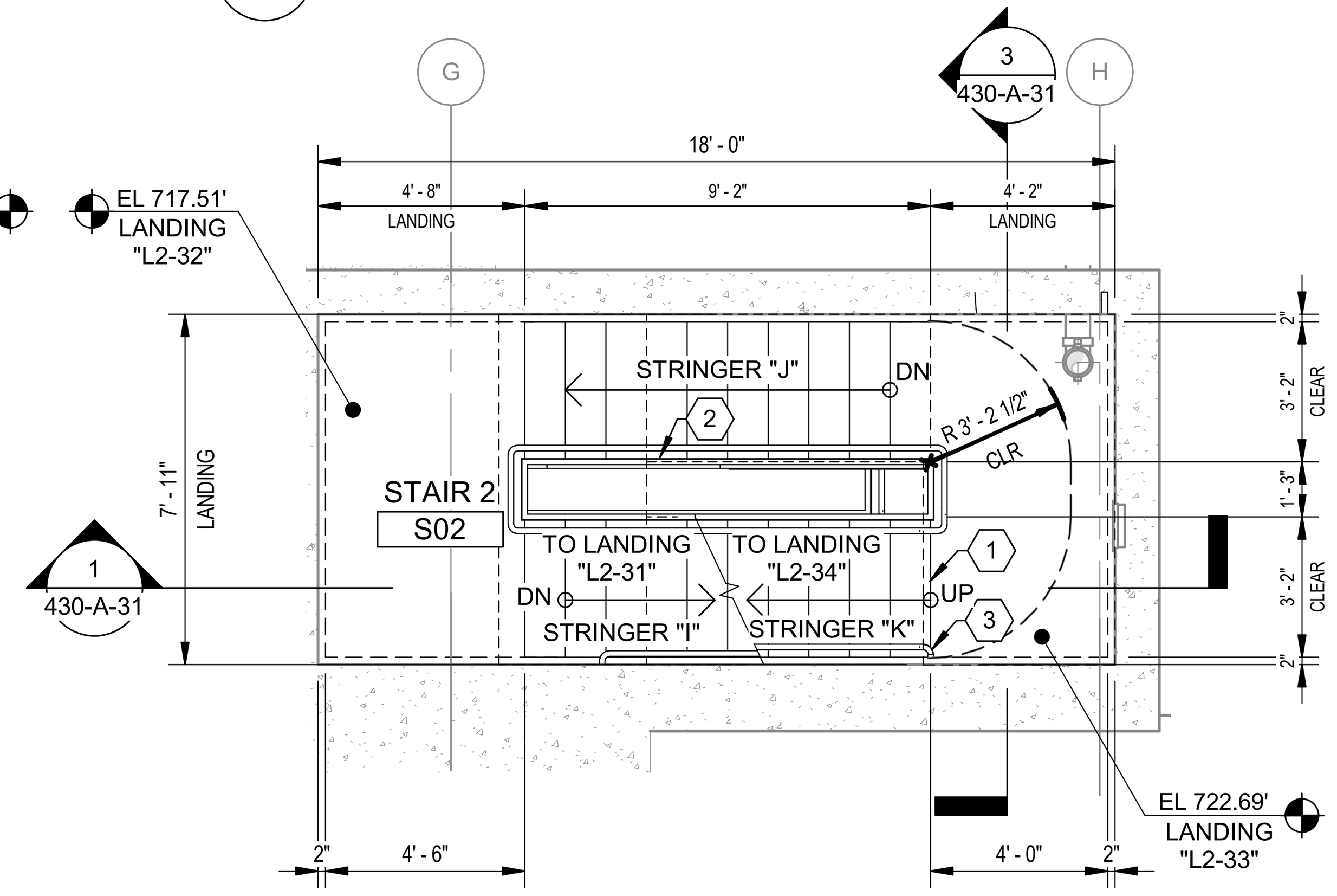
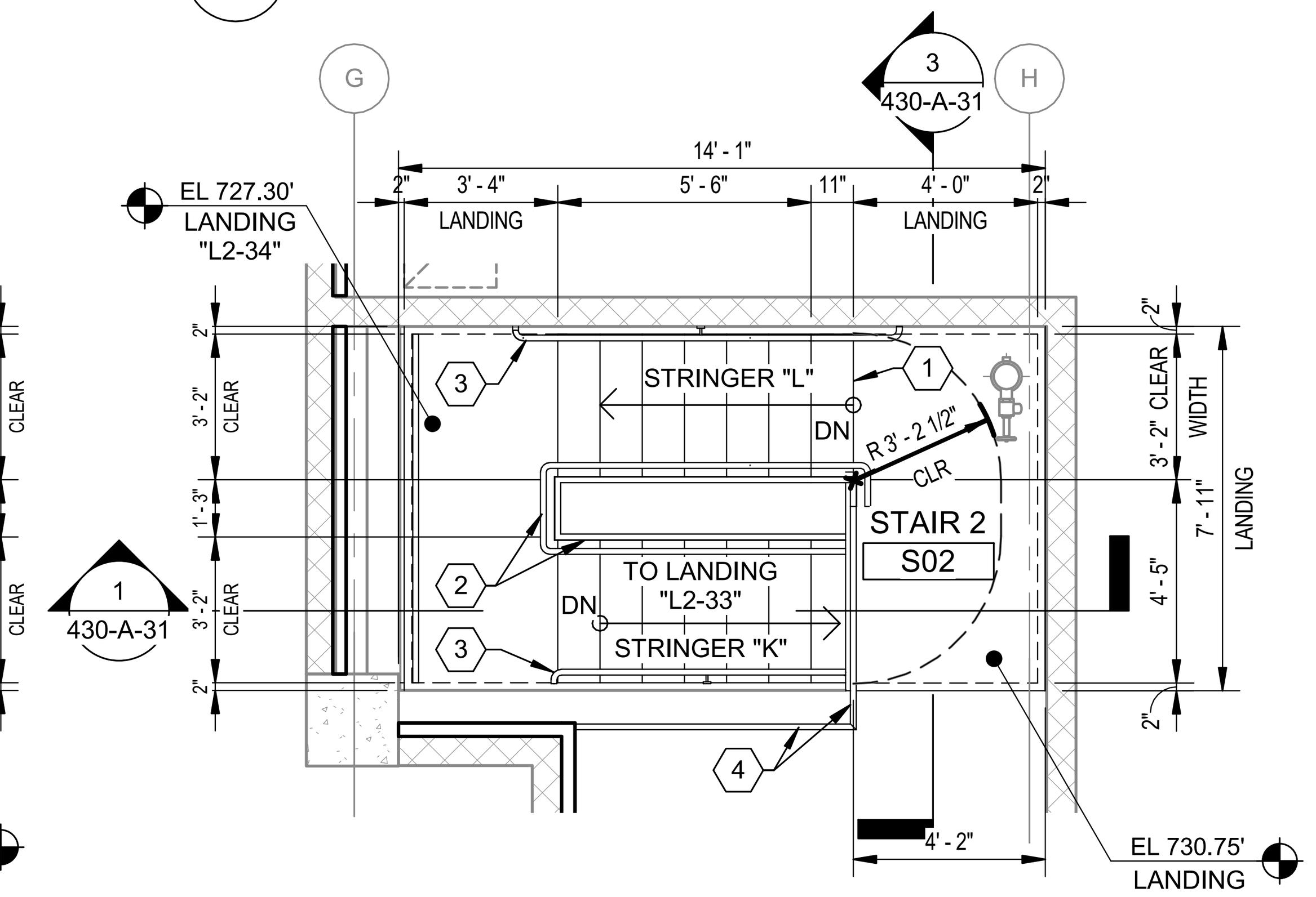


9 STAIR 2 - DISCHARGE PIPING FLOOR PLAN
SCALE: 1/4" = 1'-0"



10 STAIR 2 - ELEVATION 722.69' FLOOR PLAN
SCALE: 1/4" = 1'-0"



11 STAIR 2 - ENTRY LEVEL FLOOR PLAN
SCALE: 1/4" = 1'-0"

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

Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt

Plot Date: 8/13/2025 10:32:13 AM

Designed by: M.CONTI				
Drawn by: S.GRAMKOW				
Checked by: D.WALDROP				

REVISION			
REV No.	DATE	DESCRIPTION	APPV
0	5/16/25	ISSUE FOR BID	CKM
1	08/15/25	ADD. 9 - REVISED STAIR MATERIAL TO GALVANIZED	CKM

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Signer Name: Christine Mondor
Signing Reason: I approved this document.
Signing Time: 2025-08-19

REGISTERED ARCHITECT PENNSYLVANIA CHRISTINE MONDOR No. RA015377 15 AUG 2025

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ARLETTA SCOTT WILLIAMS
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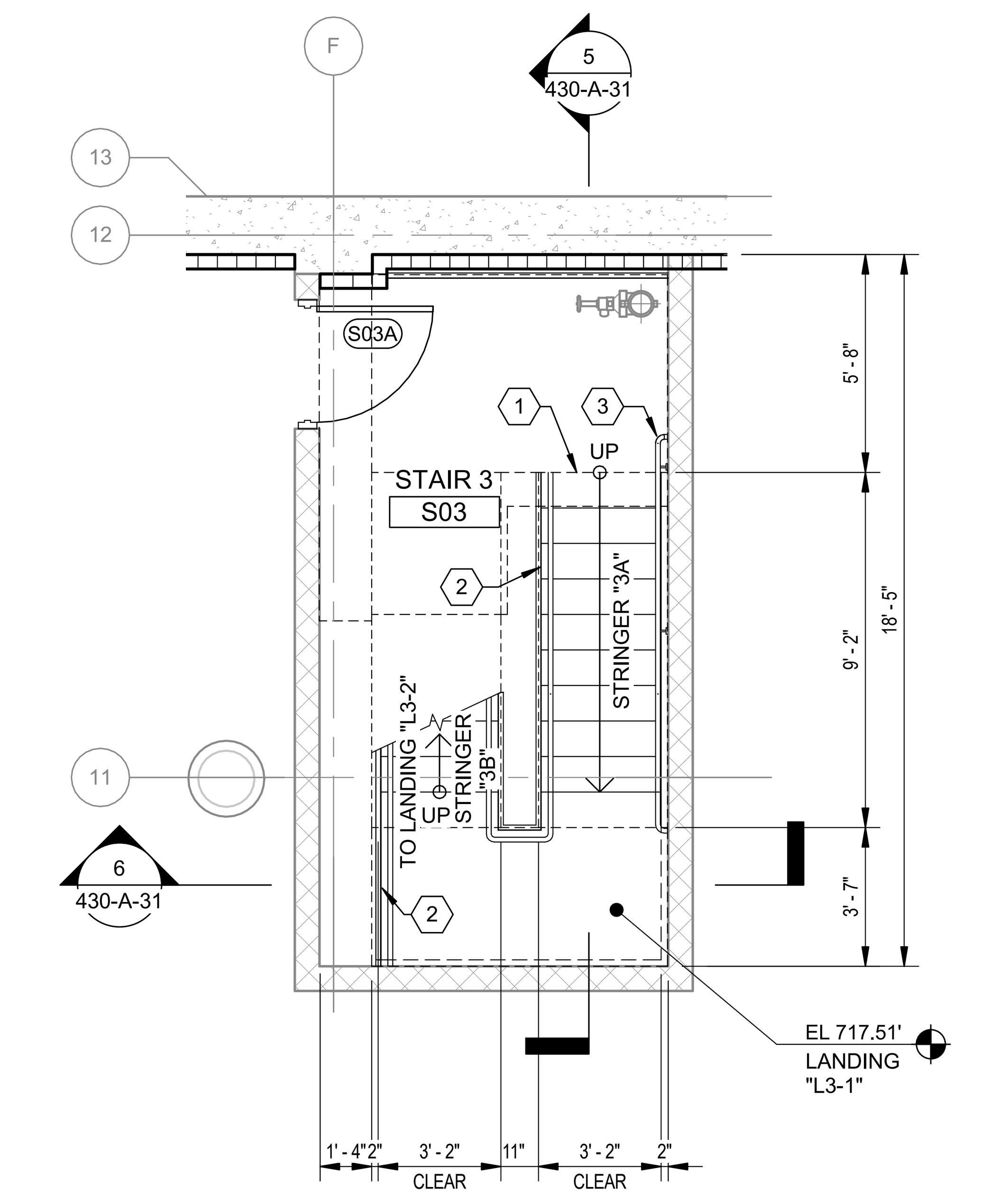
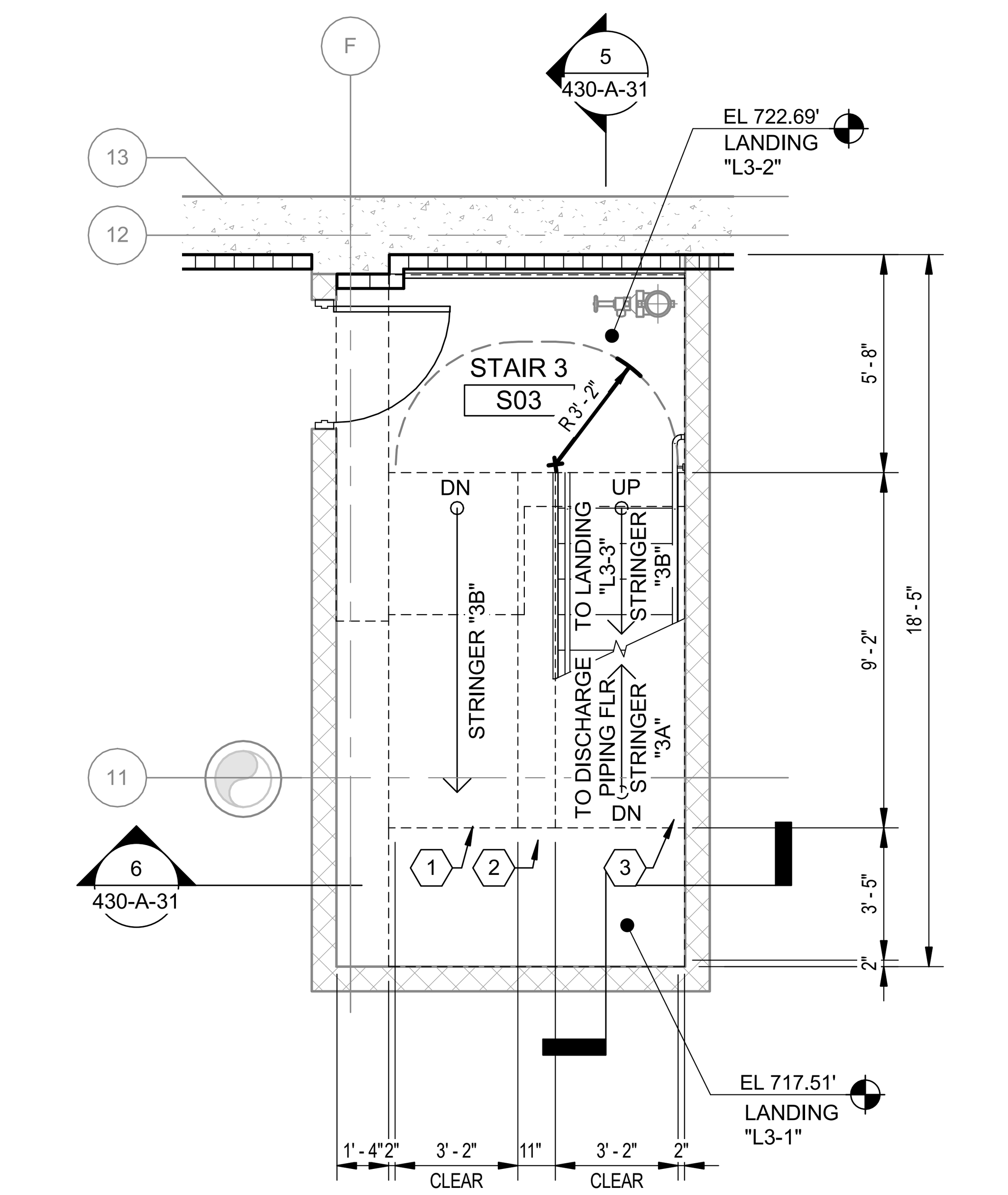
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-A-13
STAIR PLANS 2

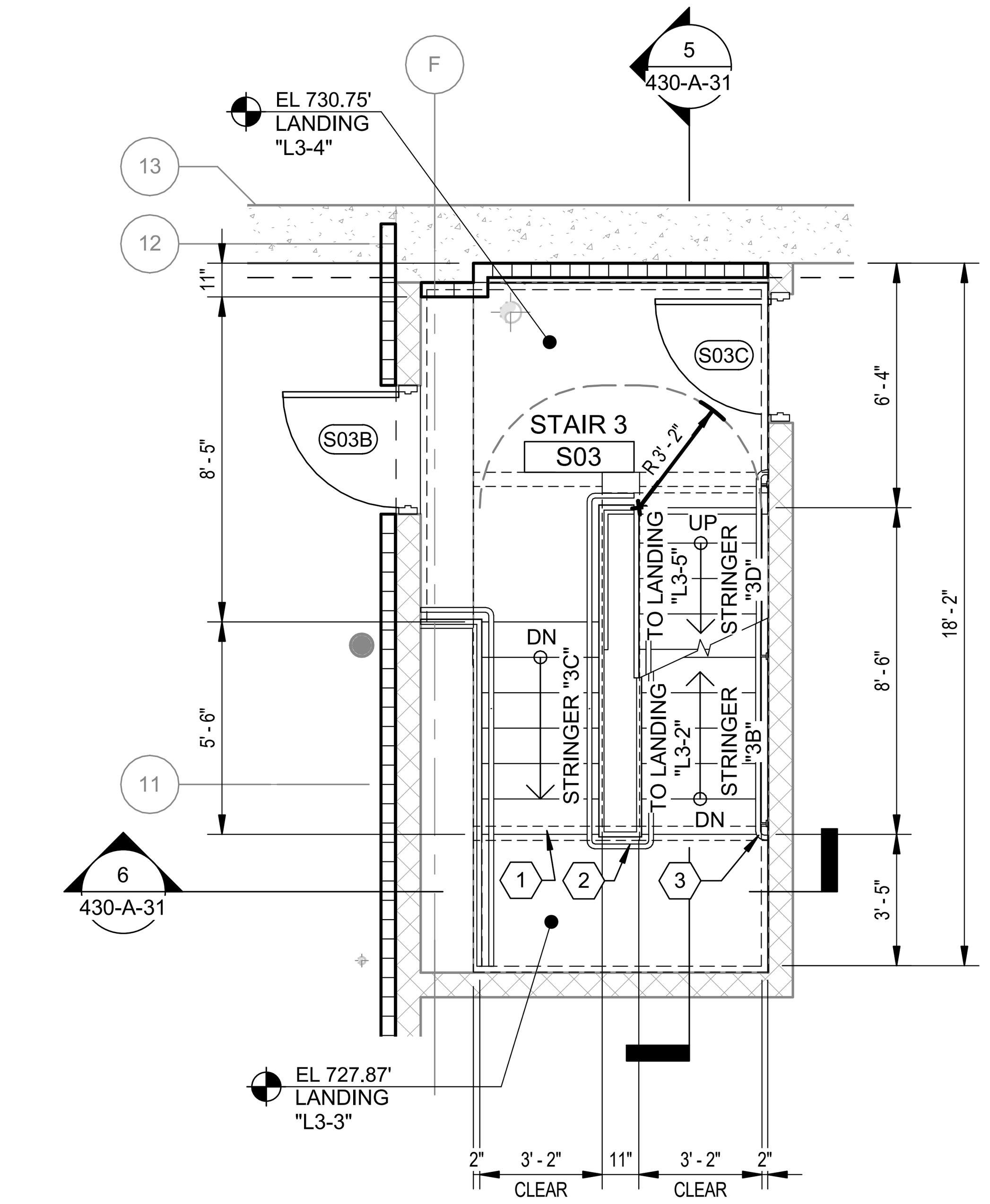
Contract: 1800
CAD File Name:
Date: 5/16/2025
Sheet: 64 of 405



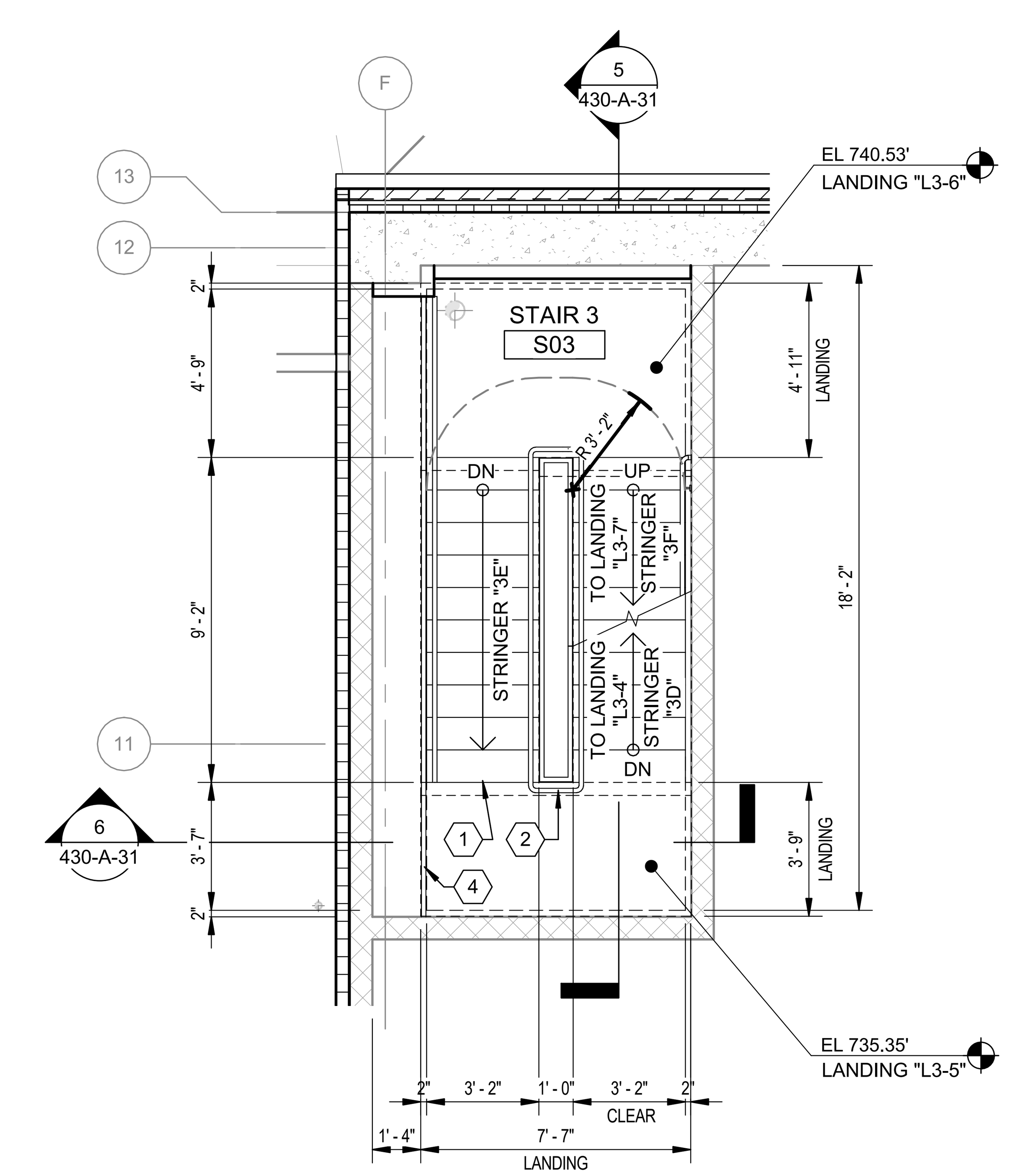
1 STAIR 3 - DISCHARGE PIPING FLOOR PLAN
430-A-20 SCALE: 1/4" = 1'-0"



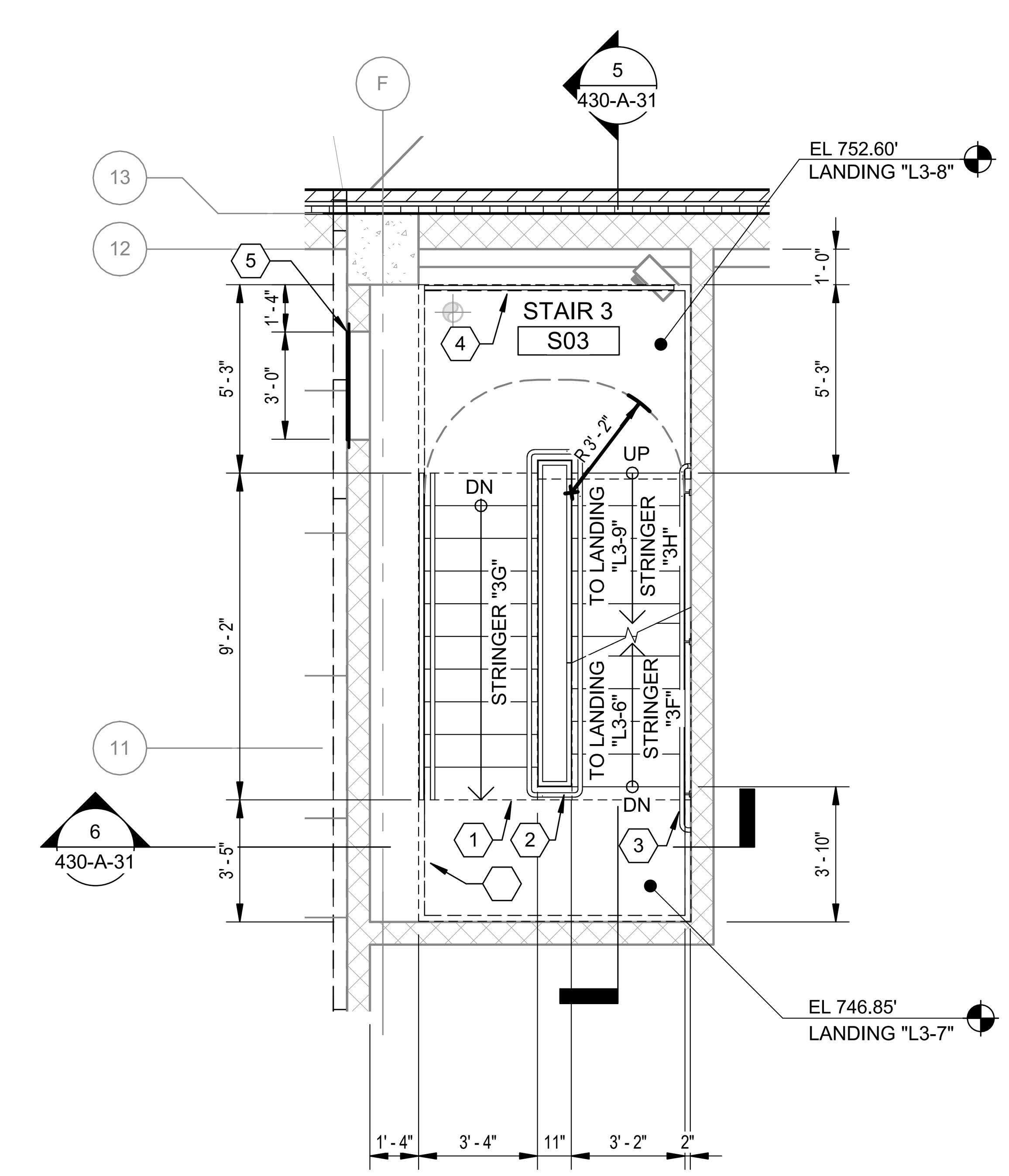
2 STAIR 3 - ELEVATION 720.96' FLOOR PLAN
430-A-04 SCALE: 1/4" = 1'-0"



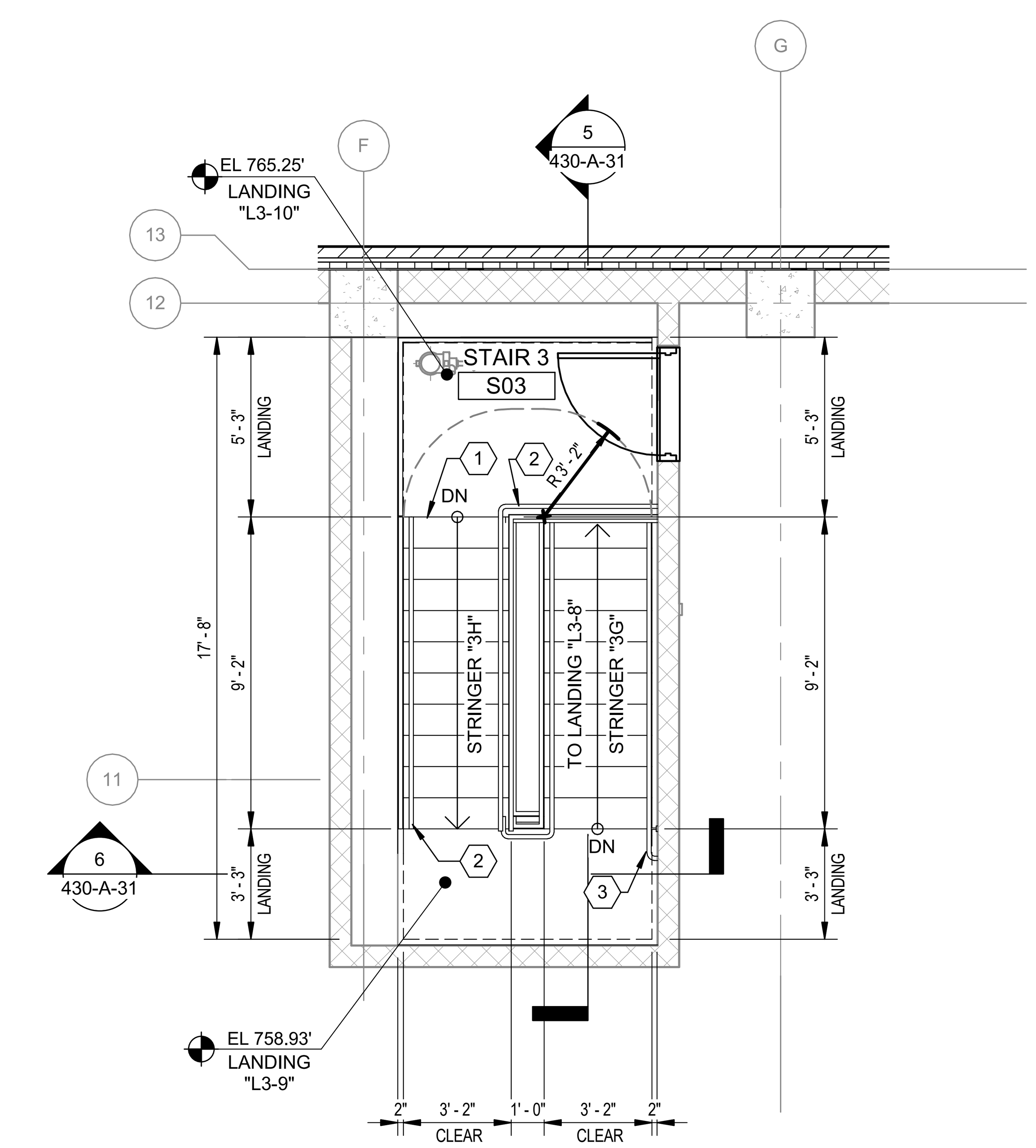
3 STAIR 3 - ENTRY LEVEL FLOOR PLAN
430-A-06 SCALE: 1/4" = 1'-0"



4 STAIR 3 - ELEVATION 740.517 FLOOR PLAN
430-A-15 SCALE: 1/4" = 1'-0"



5 STAIR 3 - ELEVATION 752.605 FLOOR PLAN
430-A-15 SCALE: 1/4" = 1'-0"



6 STAIR 3 - ELECTRICAL AND HVAC FLOOR PLAN
430-A-08 SCALE: 1/4" = 1'-0"

GENERAL NOTES:

1. ALL STEEL ASSOCIATED WITH STAIR CONSTRUCTION TO BE GALVANIZED

KEYNOTES:

1 METAL STAIR FRAMING SYSTEM WITH CONCRETE PAN TREADS & LANDING DESIGNED BY CONTRACTOR. SEE SHEET 430-A-30 STRINGER SCHEDULE FOR TREAD AND RISER INFORMATION.

2 42" HIGH METAL GUARDRAIL WITH 34" HIGH METAL HANDRAIL ABOVE TOP OF FINISHED TREAD NOSING. EXTEND 34" HIGH HANDRAIL 11" MIN PAST TOP AND BOTTOM STAIR TREAD NOSING

3 34" HIGH WALL MOUNTED HANDRAIL ABOVE TOP OF FINISHED TREAD NOSING WITH 11" MIN TOP AND BOTTOM EXTENSION PAST STAIR TREAD NOSING

4 42" HIGH ALUMINUM GUARDRAIL SYSTEM WITH TOEBOARD

5 36' X 36" 2-HOUR RATED SS ACCESS HATCH, SILL AT 16"

0 2' 4' 8'
SCALE : 1/4" = 1'-0"

Designed by: D.DIDASA
Drawn by: D.DIDASA
Checked by: D.WALDROP

REVISION

REV No.	DATE	DESCRIPTION	APPV
0	5/16/25	ISSUE FOR BID	CKM
1	08/15/25	ADD. 9 - REVISED STAIR MATERIAL TO GALVANIZED	CKM

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Signer Name: Christine Mondor
Signing Reason: I approved this document.
Signing Time: 2025-08-19 10:46:47(EDT)

REGISTERED ARCHITECT PENNSYLVANIA CHRISTINE MONDOR No. RA403153?
15 AUG 2025

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ARLETTA SCOTT WILLIAMS
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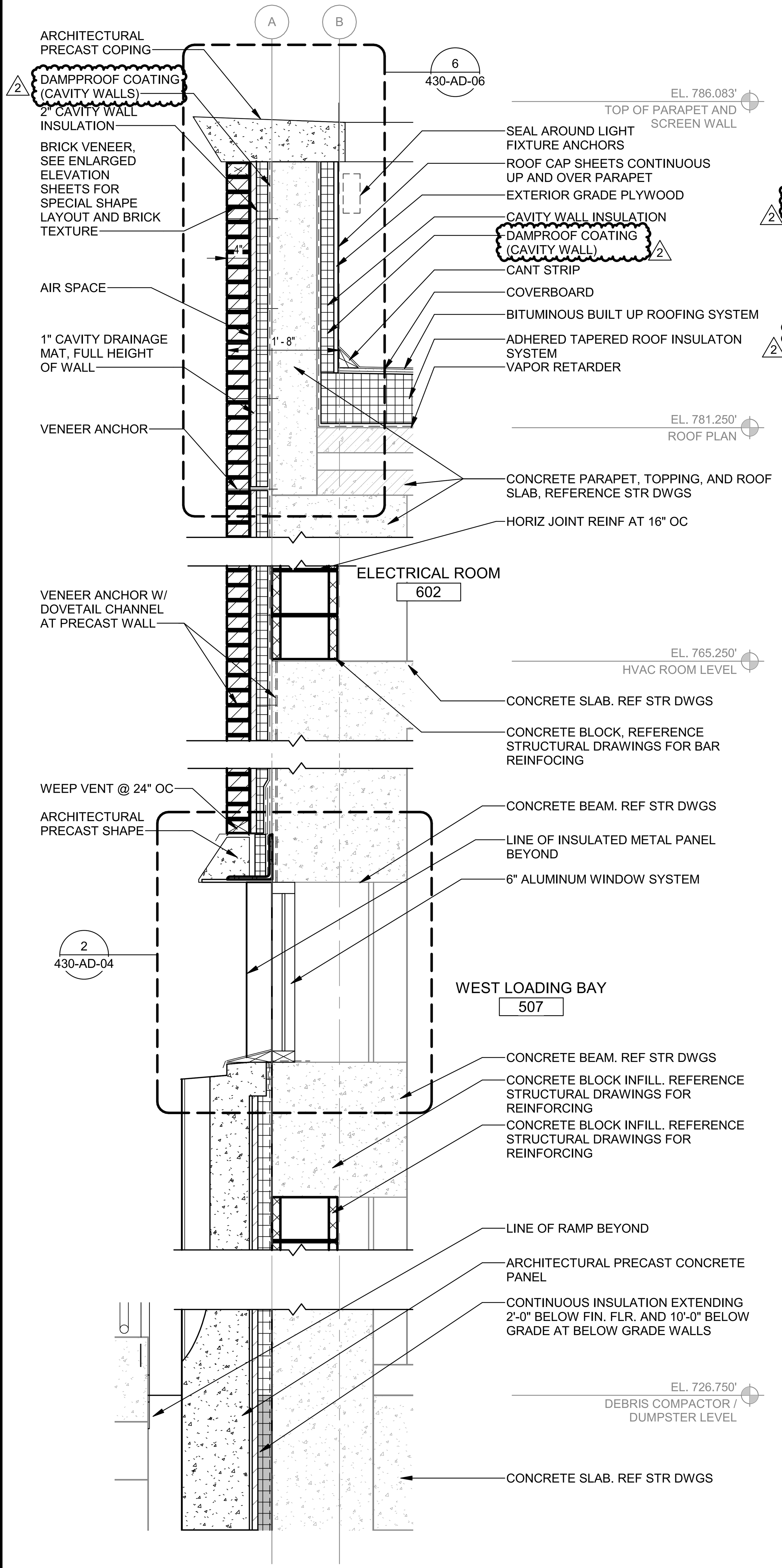
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

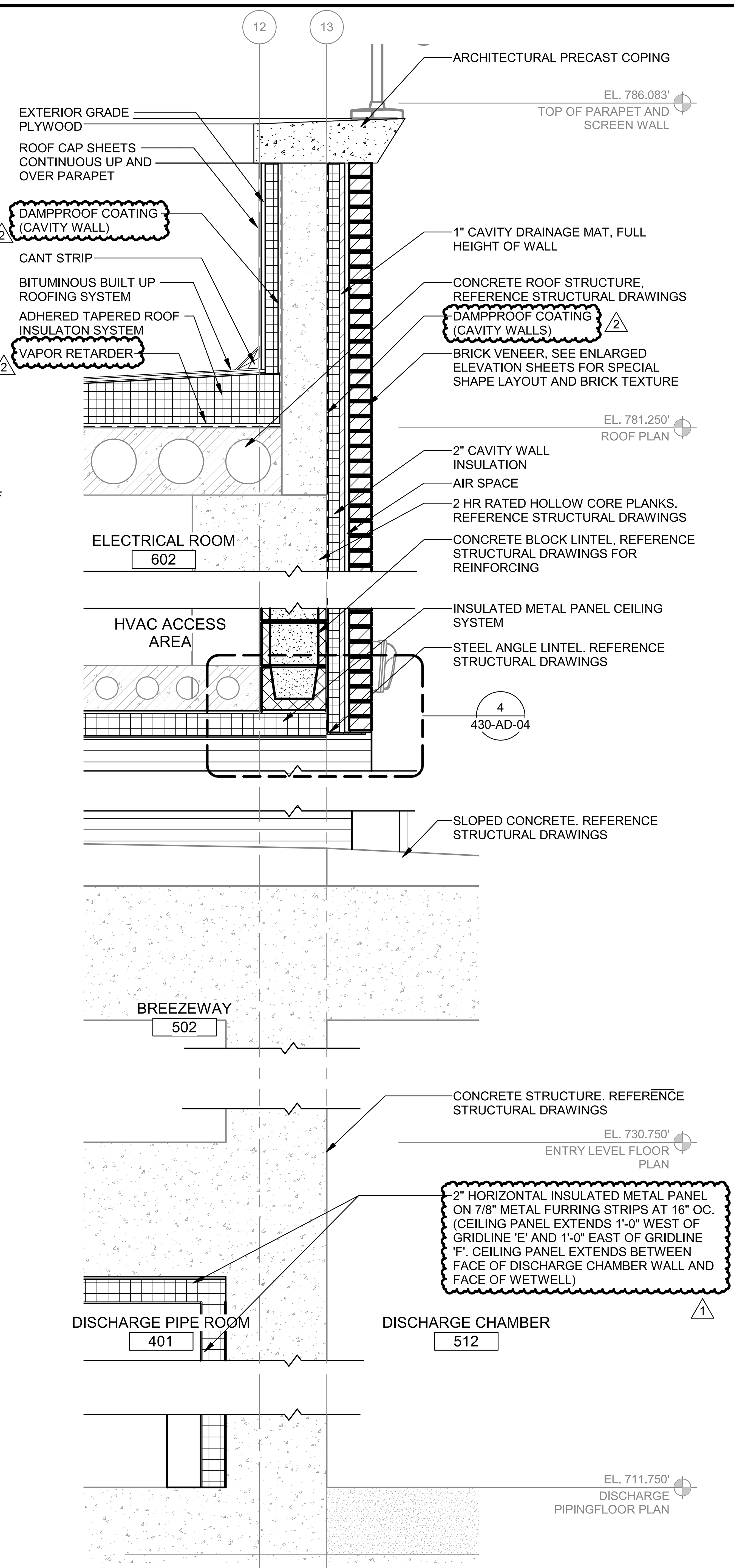
430-A-14
STAIR PLANS 3

Contract: 1800
CAD File Name:
Date: 5/16/2025
Sheet: 65 of 405

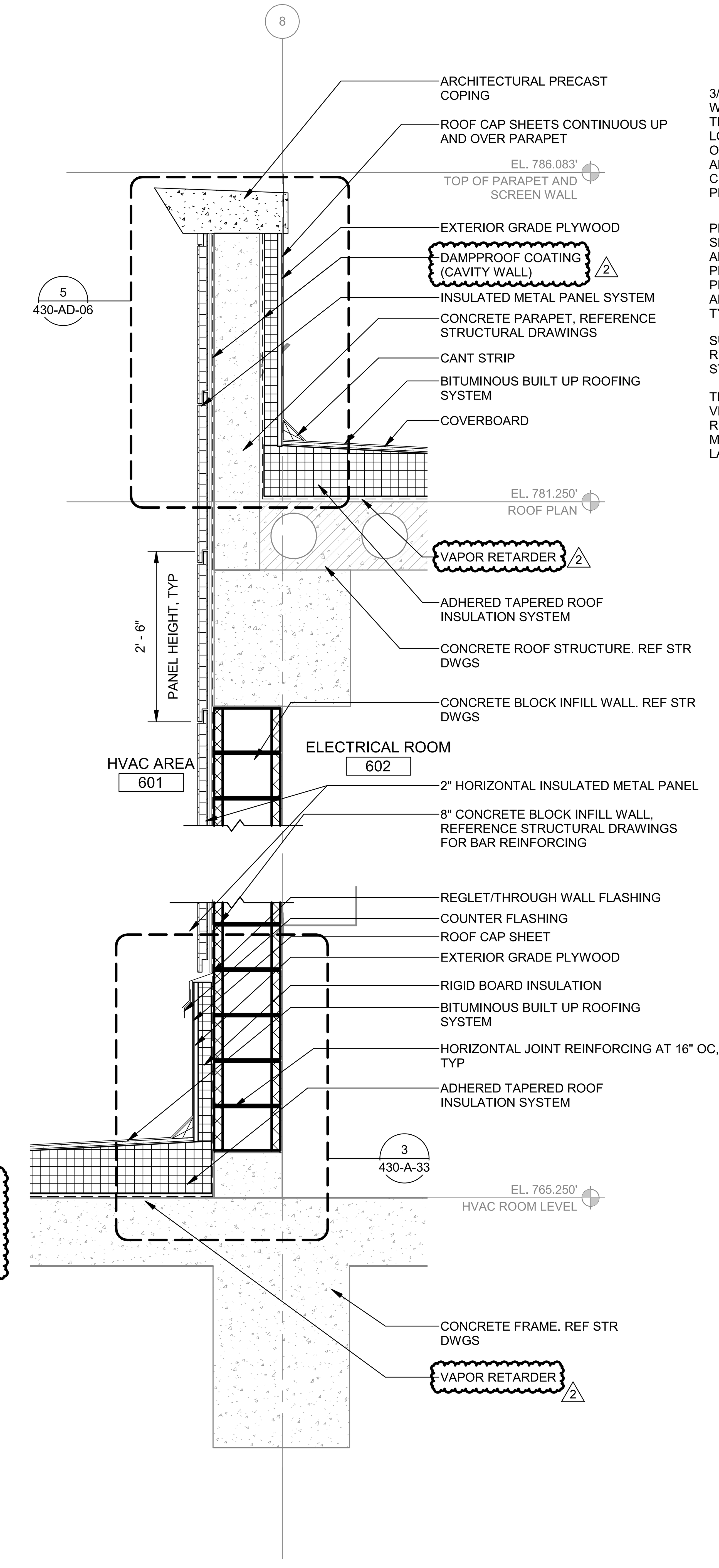
Plot Date: 8/13/2025 10:32:25 AM Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt



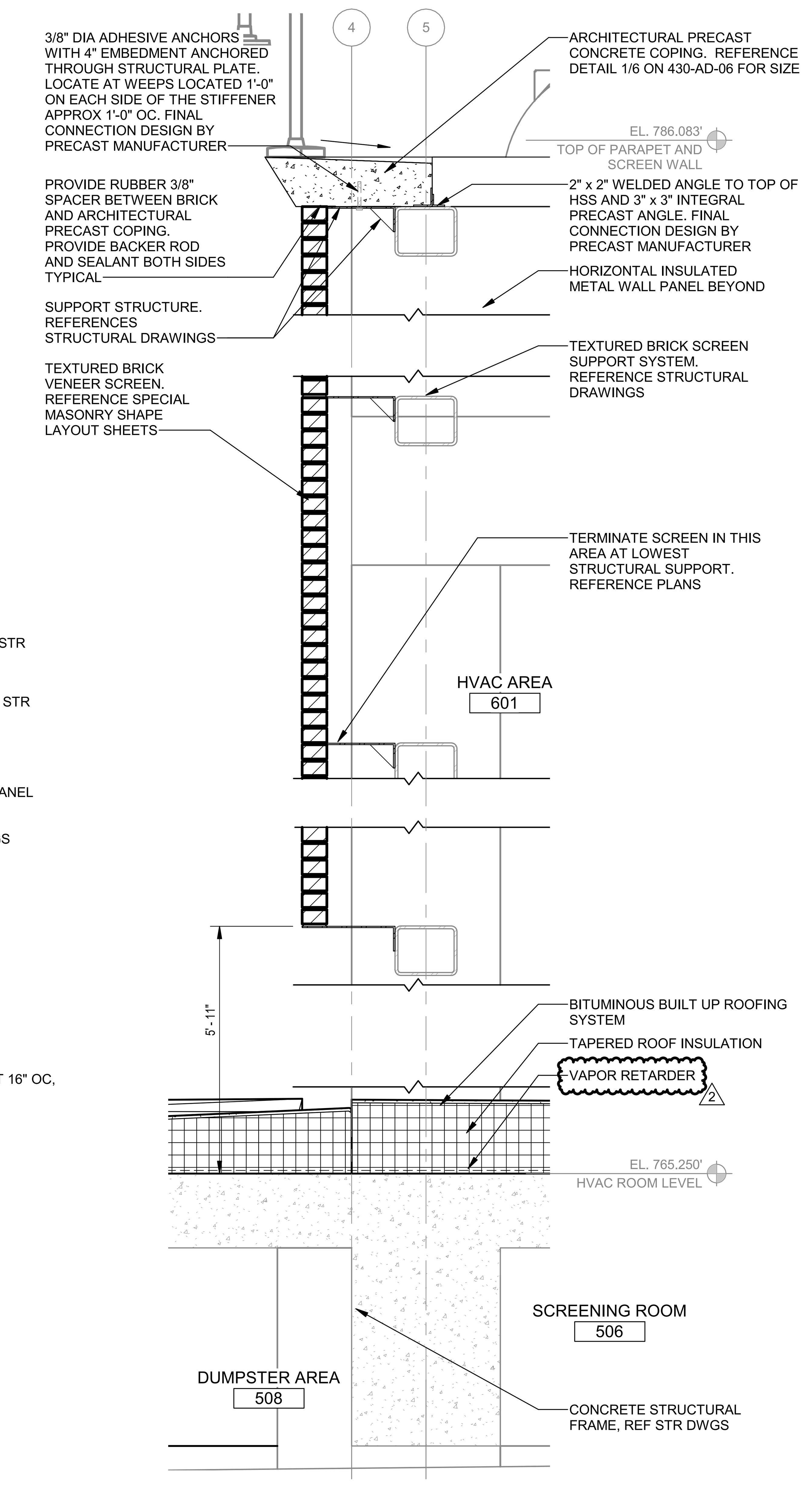
1 WALL SECTION
430-A-26



2 WALL SECTION
430-A-23



3 WALL SECTION
430-A-23



4 WALL SECTION
430-A-23

SCALE : 3/4" = 1'-0"

Plot Date: 8/13/2025 10:32:34 AM Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt

Designed by:	M.CONTI
Drawn by:	S.GRAMKOW
Checked by:	D.WALDROP

REVISION

REV No.	DATE	DESCRIPTION	APPV
0	5/16/25	ISSUE FOR BID	CKM
1	07/31/25	ADD. 6 - REVISED DETAILS, NOTES, & FINISH SCHEDULE	CKM
2	08/15/25	ADD. 9 - REVISED DAMPPROOFING AND VAPOR BARRIERS	CKM

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Signer Name: Christine Mondor
Signing Reason: I approved this document
Signing Time: 2025-08-19 10:46:47(EDT)

REGISTERED ARCHITECT PENNSYLVANIA CHRISTINE MONDOR No. RA015370 — 19 AUG 2025

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ARLETTA SCOTT WILLIAMS
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(412) 766 - 4810

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ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-A-28
WALL SECTIONS 1

Contract:	1800
CAD File Name:	
Date:	5/16/2025
Sheet:	79 of 405

Plot Date: 8/13/2025 10:32:41 AM Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt

Designed by:	S.GRAMKOW
Drawn by:	S.GRAMKOW
Checked by:	D.WALDROP

REVISION

REV No.	DATE	DESCRIPTION	APPV
0	5/16/25	ISSUE FOR BID	CKM
1	08/15/25	ADD. 9 - REVISED DAMPPROOFING AND VAPOR BARRIERS	CKM

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REGISTERED ARCHITECT PENNSYLVANIA CHRISTINE MONDOR No. RA403527 15 AUG 2025

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ARLETTA SCOTT WILLIAMS
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(412) 766 - 4810

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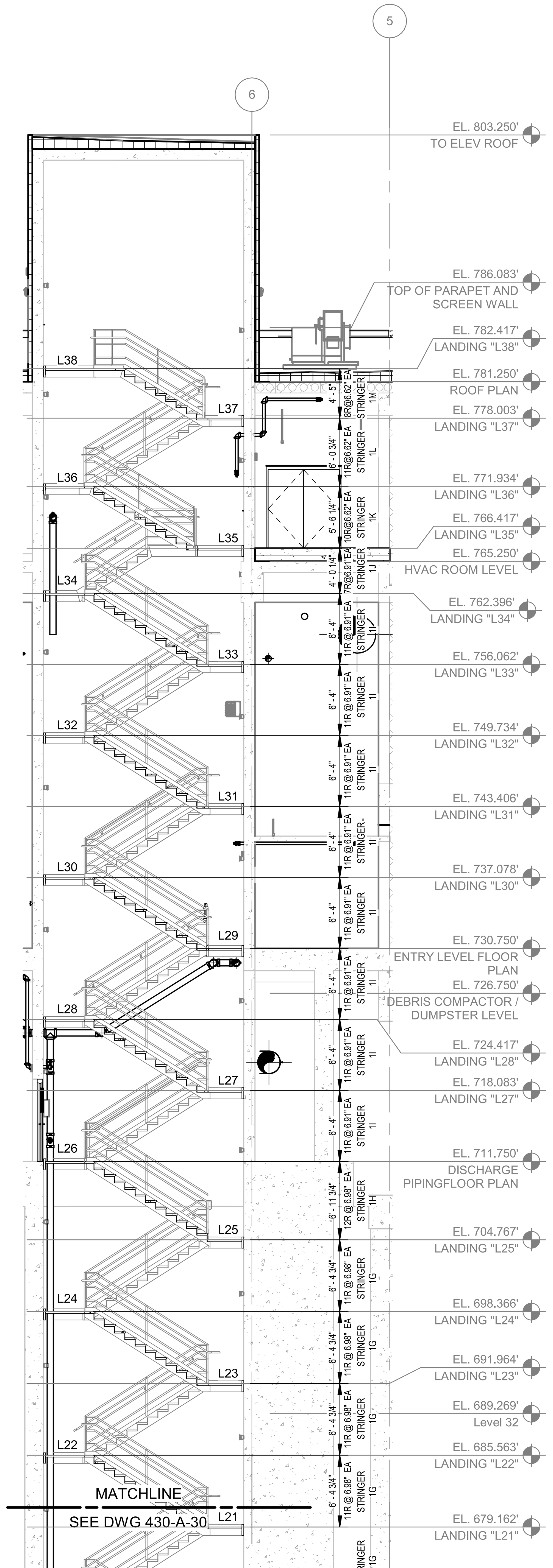
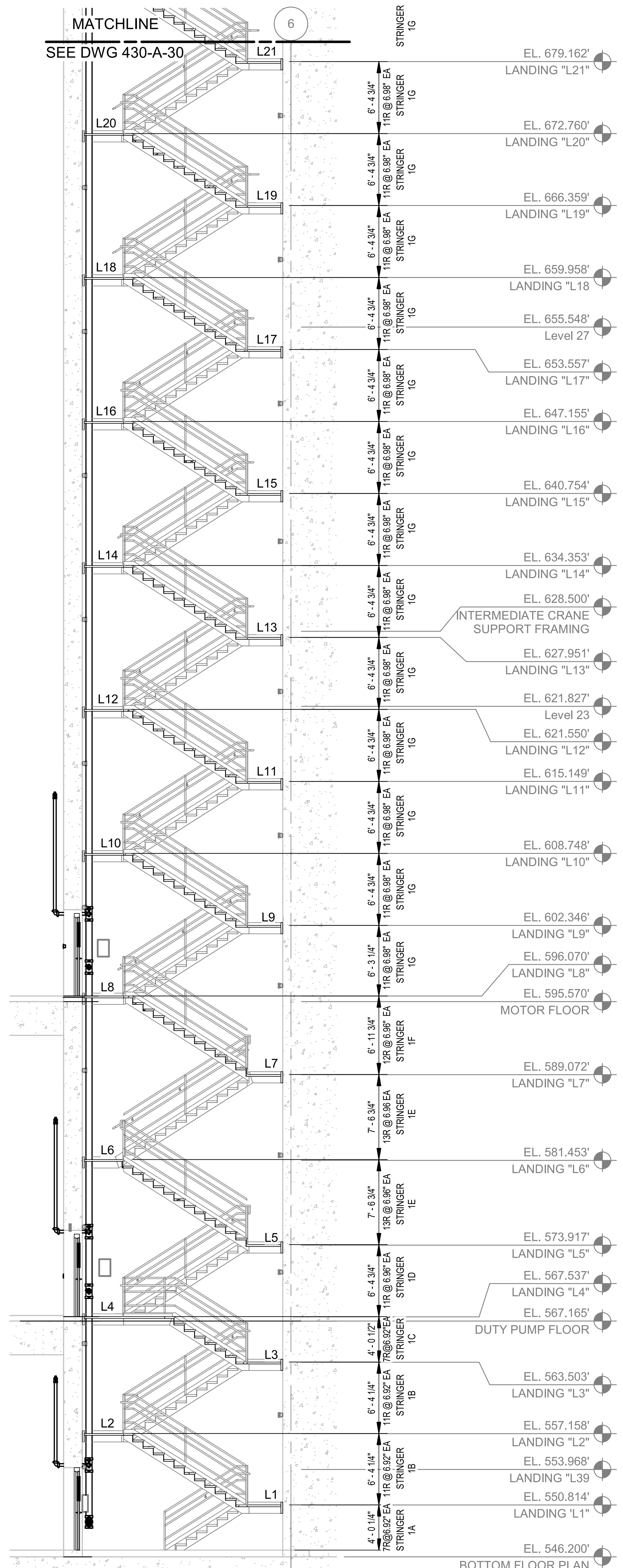
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-A-29
WALL SECTIONS 2

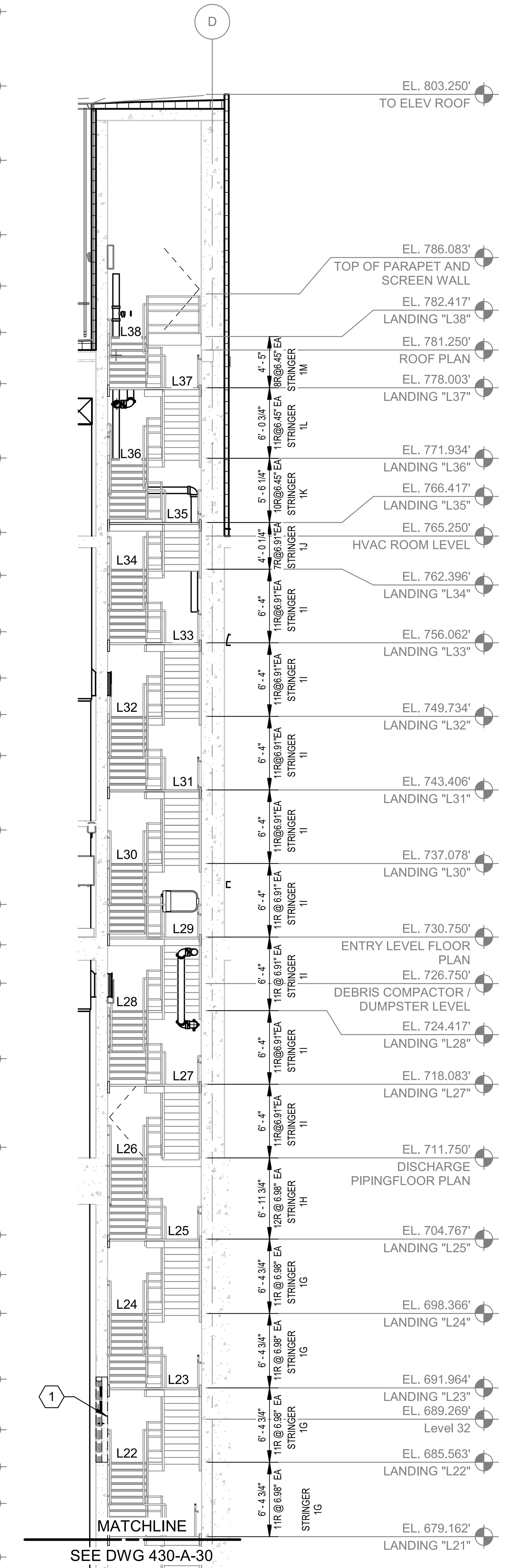
Contract: 1800
CAD File Name:
Date: 5/16/2025
Sheet: 80 of 405



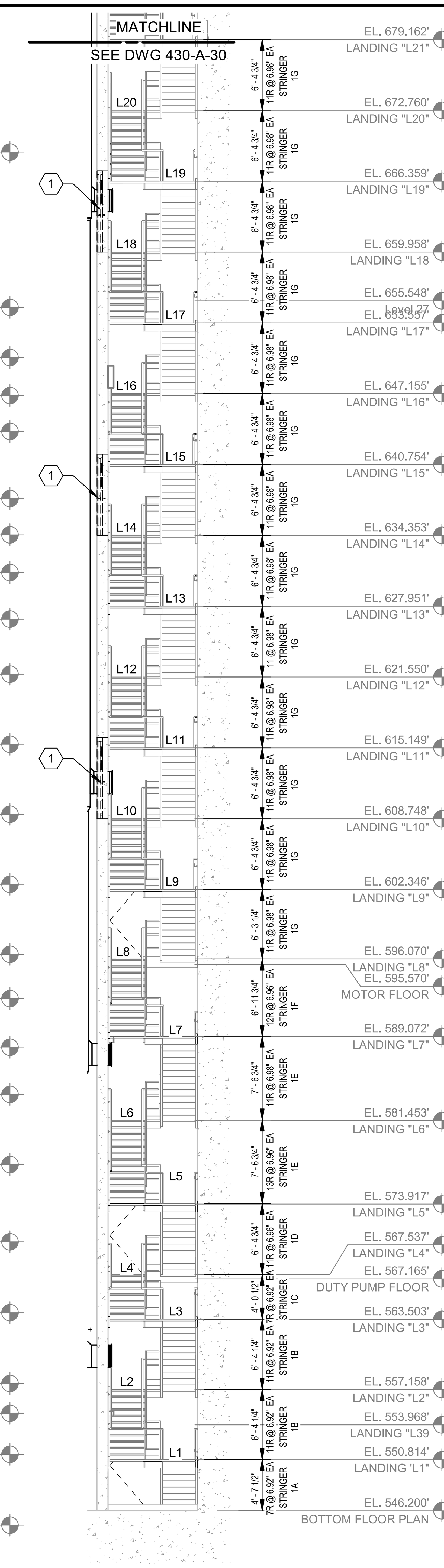
1 STAIR 1 - SECTION - LONG - TOP
430-A-12



2 STAIR 1 - SECTION - LONG - BOTTOM
430-A-12



3 STAIR 1 - SECTION - SHORT - TOP
430-A-12



4 STAIR 1 - SECTION - SHORT - BOTTOM
430-A-12 SCALE: 1/8" = 1'-0"

GENERAL NOTES:

1. ALL STEEL ASSOCIATED WITH STAIR CONSTRUCTION TO BE GALVANIZED

KEYNOTES:

1 ELEVATOR ACCESS DOOR LOCATED ON LANDING 10,14, 18, 22. REFERENCE DOOR 510H ON VIEW 5/ 430-A-12 FOR TYPICAL LOCATION

STAIR STRINGER SCHEDULE

STRINGER MARK	NO. OF TREADS	TREAD LENGTH	NO. OF RISER	RISER HEIGHTS	TREAD DETAIL			COMMENTS
					BOTTOM	MID	UPPER	
1A	7	11"	7	6.92"	4/430-AD-13	1/430-AD-13	2/430-AD-13	
1B	12	11"	11	6.92"	5/430-AD-13	1/430-AD-13	2/430-AD-13	
1C	8	11"	7	6.92"	5/430-AD-13	1/430-AD-13	2/430-AD-13	
1D	12	11"	11	"6.96"	5/430-AD-13	1/430-AD-13	2/430-AD-13	
1E	12	11"	13	6.96"	6/430-AD-13	1/430-AD-13	3/430-AD-13	
1F	12	11"	12	6.96"	6/430-AD-13	1/430-AD-13	2/430-AD-13	
1G	12	11"	11	6.98"	5/430-AD-13	1/430-AD-13	2/430-AD-13	
1H	12	11"	12	6.98"	6/430-AD-13	1/430-AD-13	2/430-AD-13	
1I	12	11"	11	6.91"	5/430-AD-13	1/430-AD-13	2/430-AD-13	
1J	6	11"	7	6.91"	6/430-AD-13	1/430-AD-13	3/430-AD-13	
1K	11	11"	10	6.62"	5/430-AD-13	1/430-AD-13	2/430-AD-13	
1L	12	11"	11	6.62"	5/430-AD-13	1/430-AD-13	2/430-AD-13	
1M	9	11"	8	6.62"	5/430-AD-13	1/430-AD-13	2/430-AD-13	
2A	10	11"	10	6.92"	4/430-AD-13	1/430-AD-13	2/430-AD-13	
2B	10	11"	9	6.92"	5/430-AD-13	1/430-AD-13	2/430-AD-13	
2C	10	11"	9	6.96"	5/430-AD-13	1/430-AD-13	2/430-AD-13	
2D	10	11"	11	6.96"	6/430-AD-13	1/430-AD-13	3/430-AD-13	
2E	9	11"	9	6.96"	6/430-AD-13	1/430-AD-13	2/430-AD-13	
2F	10	11"	9	6.98"	5/430-AD-13	1/430-AD-13	2/430-AD-13	
2G	10	11"	11	6.98"	6/430-AD-13	1/430-AD-13	3/430-AD-13	
2H	3	11	4	6.98"	6/430-AD-13	1/430-AD-13	3/430-AD-13	
2I	10	11"	10	6.91"	6/430-AD-13	1/430-AD-13	2/430-AD-13	
2J	10	11"	9	6.91"	5/430-AD-13	1/430-AD-13	2/430-AD-13	
2K	7	11"	8	6.98"	6/430-AD-13	1/430-AD-13	3/430-AD-13	
2L	7	11"	6	6.91"	5/430-AD-13	1/430-AD-13	2/430-AD-13	
3A	10	11"	10	6.91"	4/430-AD-13	1/430-AD-13	2/430-AD-13	
3B	10	11"	9	6.91"	5/430-AD-13	1/430-AD-13	2/430-AD-13	
3C	6	11"	5	6.91"	5/430-AD-13	1/430-AD-13	2/430-AD-13	
3D	9	11"	8	6.92"	5/430-AD-13	1/430-AD-13	2/430-AD-13	
3E	10	11"	9	6.92"	5/430-AD-13	1/430-AD-13	2/430-AD-13	
3F	10	11"	11	6.92"	6/430-AD-13	1/430-AD-13	3/430-AD-13	
3G	10	11"	10	6.90"	6/430-AD-13	1/430-AD-13	2/430-AD-13	
3H	10	11"	11	6.90"	6/430-AD-13	1/430-AD-11	3/430-AD-13	

REMARKS: ALL STEEL ASSOCIATED WITH STAIR CONSTRUCTION TO BE GALVANIZED

0 4' 8' 16'
SCALE : 1/8" = 1'-0"

Designed by: M.CONTI
Drawn by: S.GRAMKOW
Checked by: D.WALDROP

REVISION

REV No.	DATE	DESCRIPTION	APPV
0	5/16/25	ISSUE FOR BID	CKM
1	08/15/25	ADD. 9 - REVISED STAIR MATERIAL TO GALVANIZED	CKM

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Signer Name: Christine Mondor
Signing Reason: I approved this document.
Signing Time: 2025-08-15 10:46:47(EDT)

REGISTERED ARCHITECT PENNSYLVANIA CHRISTINE MONDOR No. RA015271 15 AUG 2025

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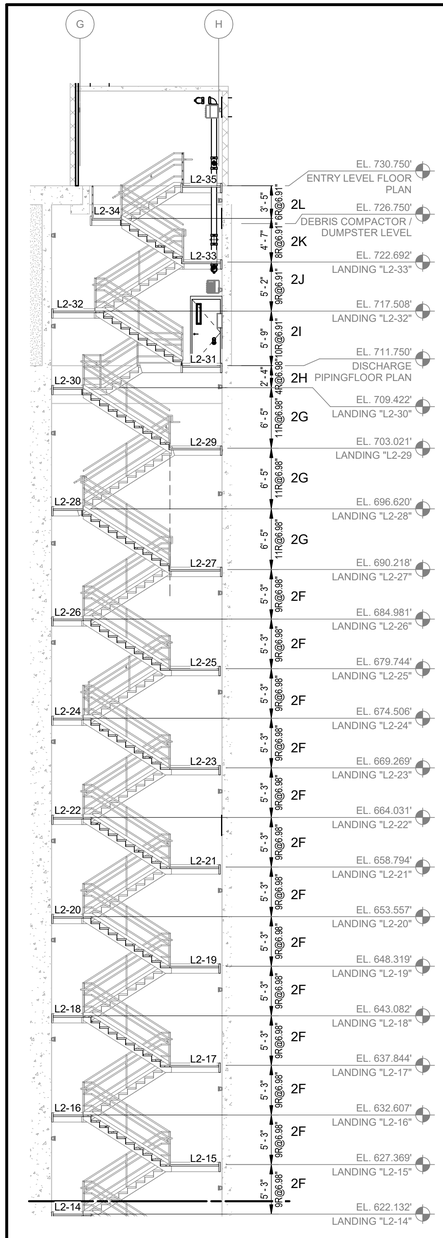
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-A-30
STAIR SECTIONS 1

Contract: 1800
CAD File Name:
Date: 5/16/2025
Sheet: 81 of 405

Plot Date: 8/13/2025 10:32:55 AM Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt



GENERAL NOTES:

1. ALL STEEL ASSOCIATED WITH STAIR CONSTRUCTION TO BE GALVANIZED

1

1 STAIR 2 - SECTION - LONG - TOP
430-A-13

2 STAIR 2 - SECTION - LONG - BOTTOM
430-A-13

3 STAIR 2 - SECTION - SHORT - TOP
430-A-13

4 STAIR 2 - SECTION - SHORT - BOTTOM
430-A-13

5 STAIR 3 - SECTION - LONG
430-A-14

6 STAIR 3 - SECTION - SHORT
430-A-14

0 4' 8' 16'
SCALE : 1/8" = 1'-0"

Plot Date: 8/13/2025 10:33:06 AM Path:BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt

Designed by:
M.CONTI
Drawn by:
S.GRAMKOW
Checked by:
D.WALDROP

REVISION			
REV No.	DATE	DESCRIPTION	APPV
0	5/16/25	ISSUE FOR BID	CKM
1	08/15/25	ADD. 9 - REVISED STAIR MATERIAL TO GALVANIZED	CKM

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Signer Name: Christine Mondor
Signing Reason: I approved this document.
Signing Time: 2025-08-19 10:46:47(EDT)

CHRISTINE MONDOR No. RA403 15377
15 AUG 2025

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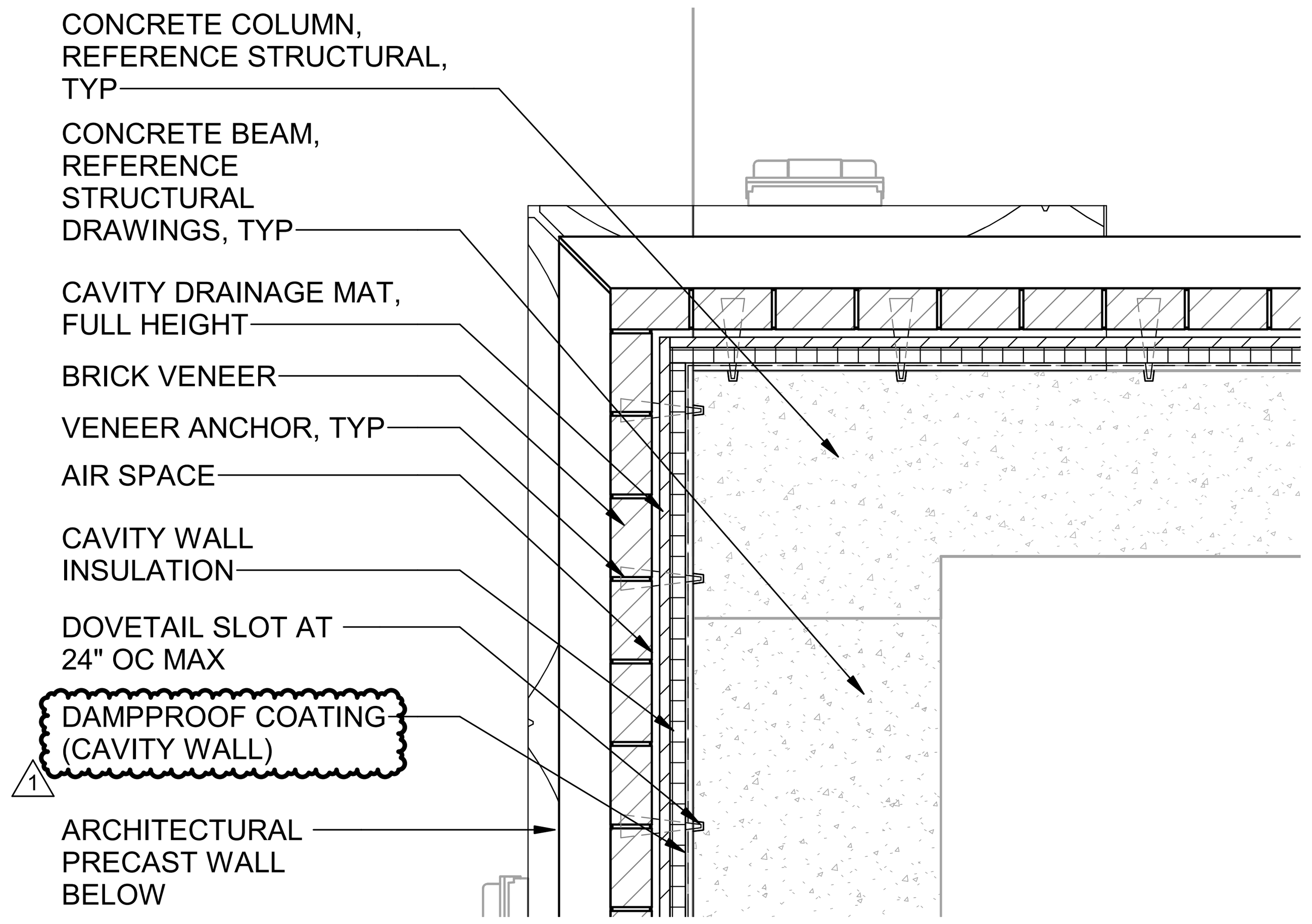
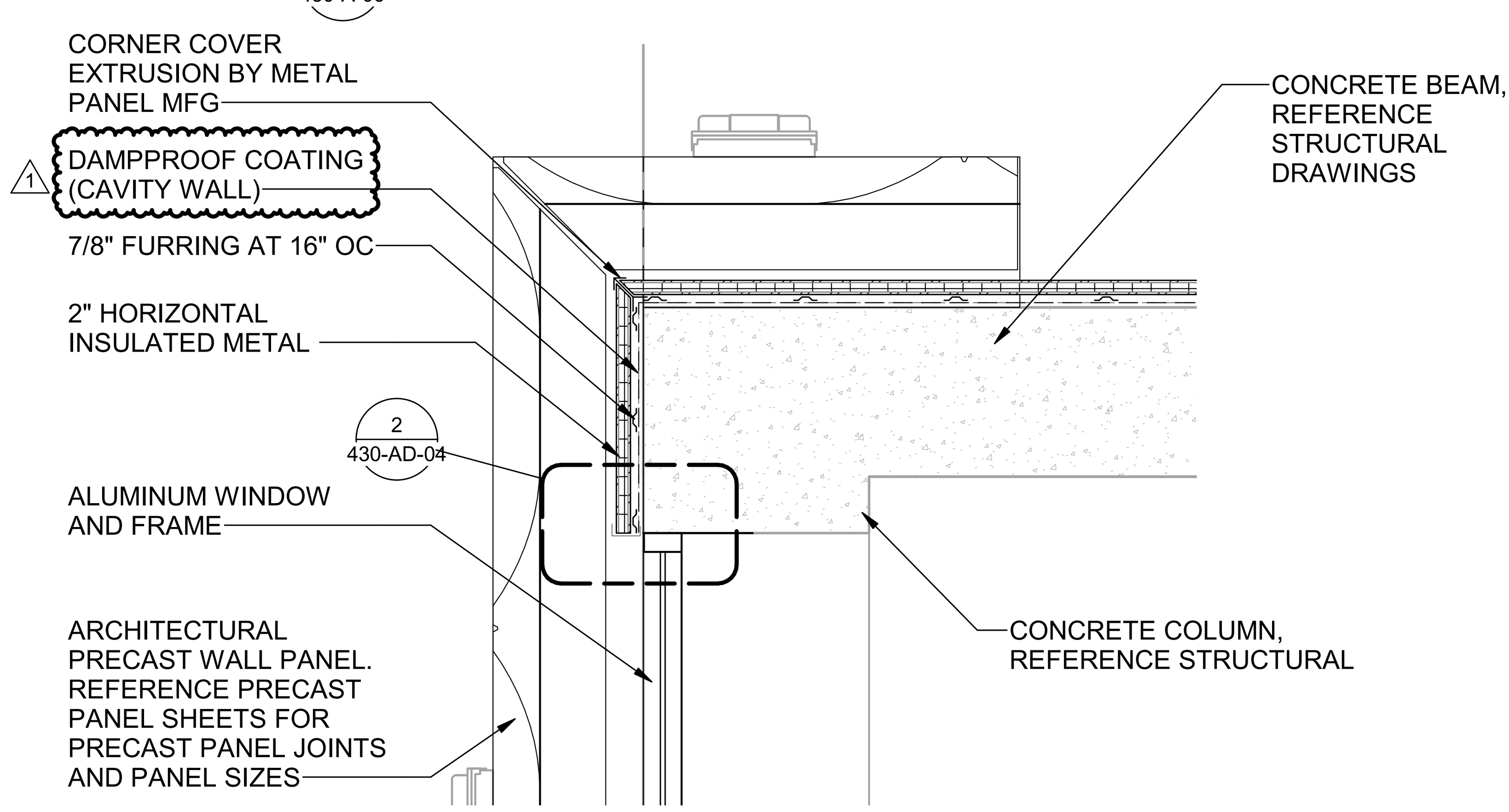
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-A-31
STAIR SECTIONS 2

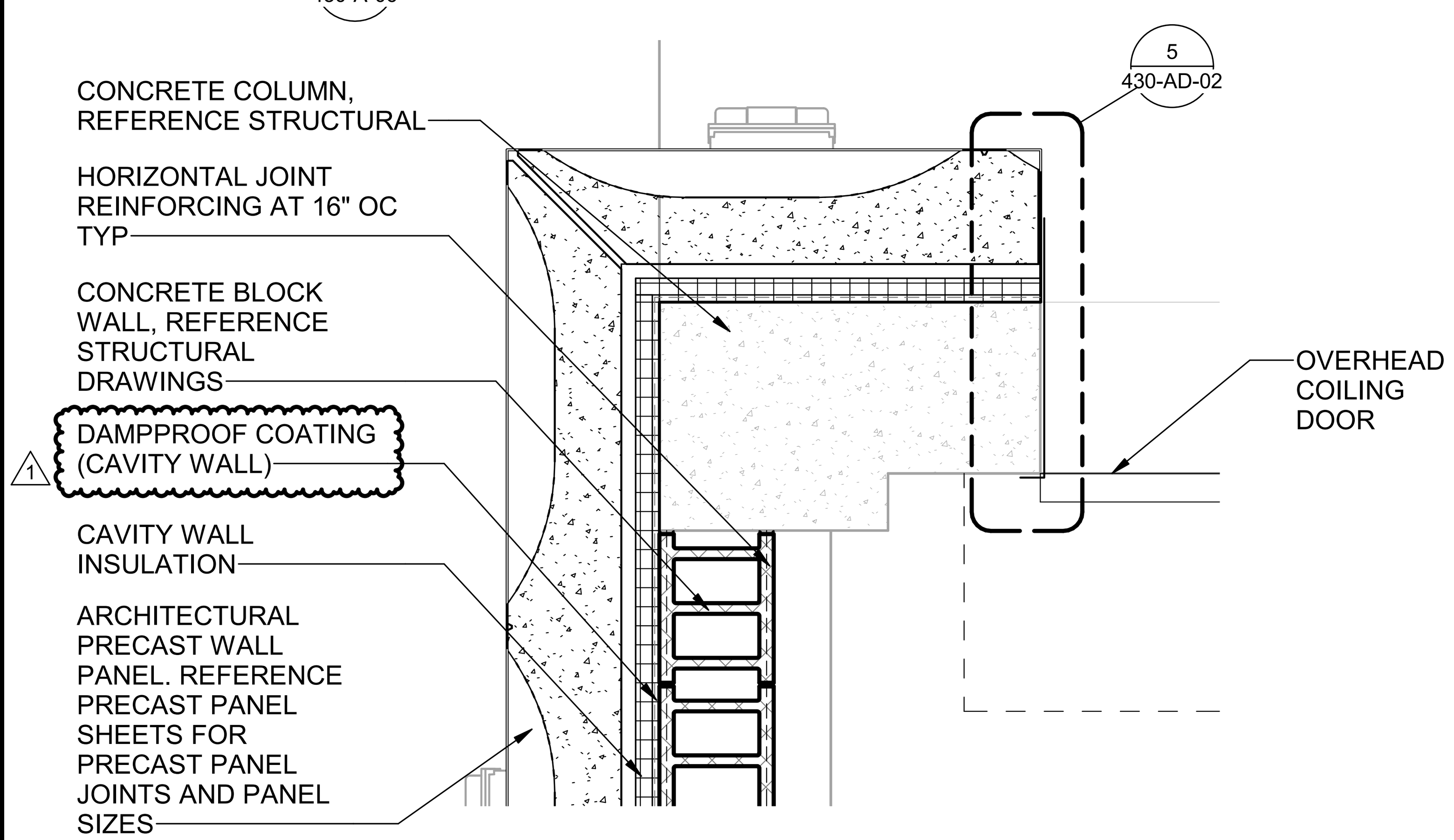
Contract: 1800
CAD File Name:
Date: 5/16/2025
Sheet: 82 of 405



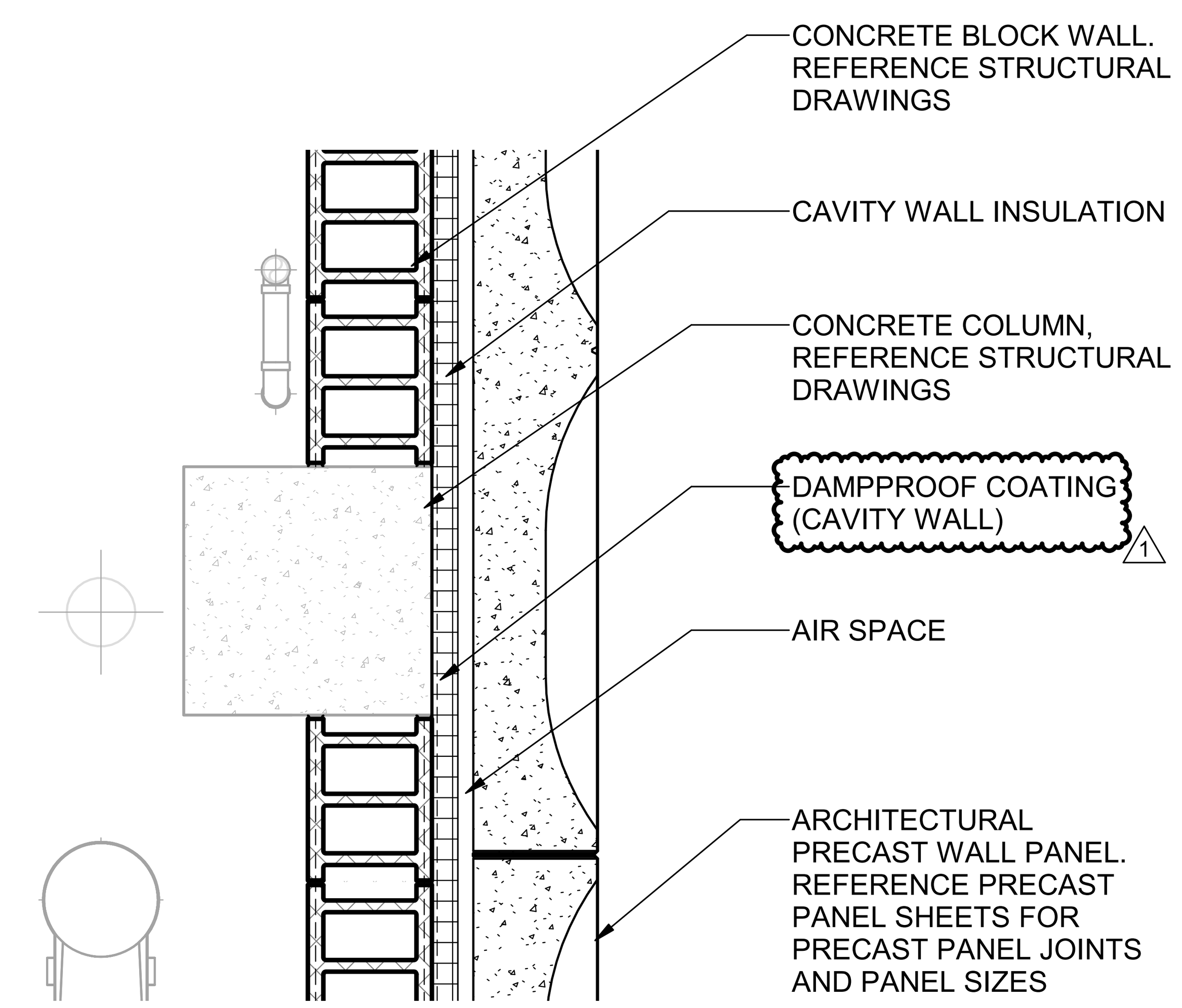
1 430-A-06 PLAN DETAIL A - AT BRICK - EL 744.0'



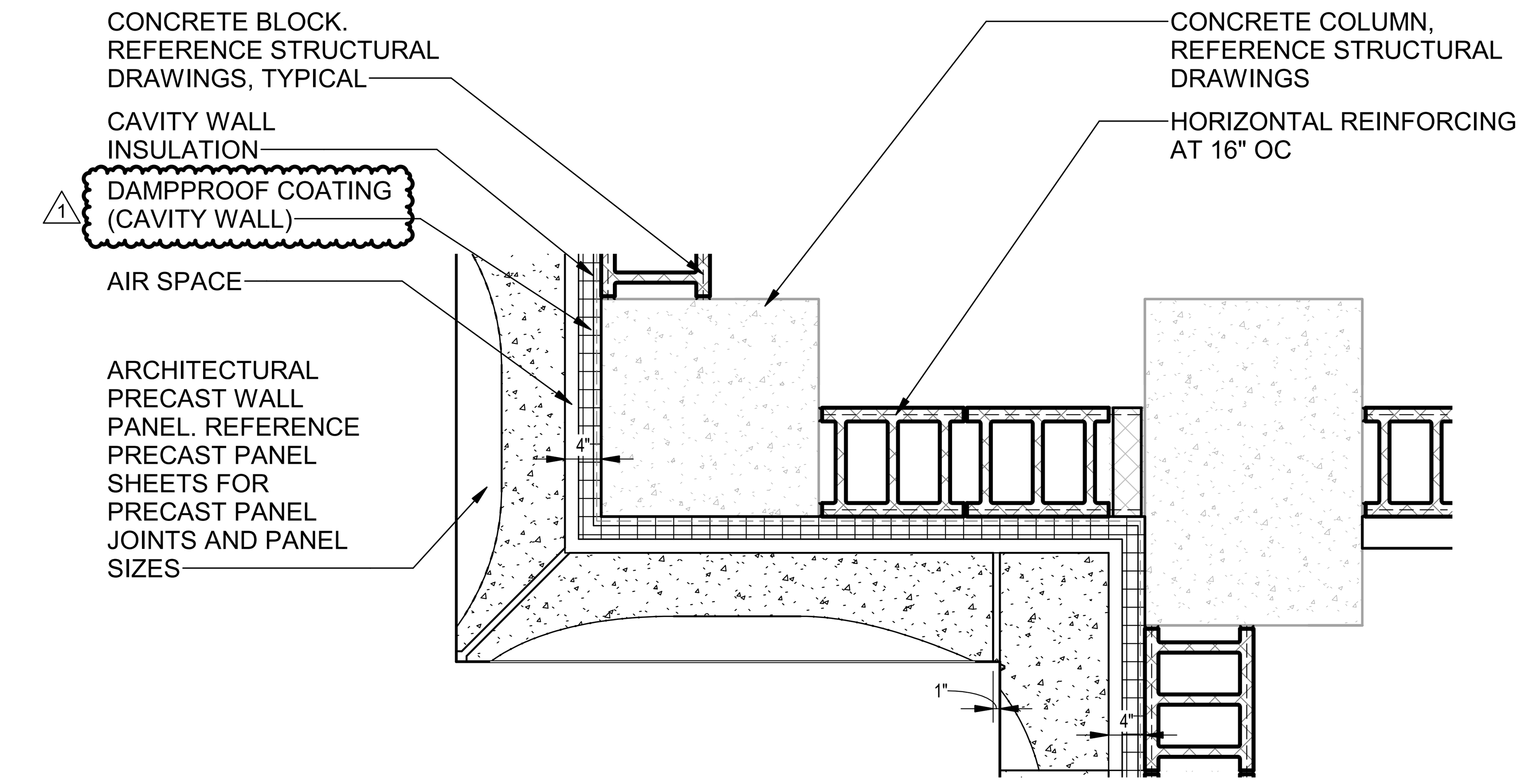
2 430-A-06 PLAN DETAIL A - AT METAL PANEL (WINDOW) - EL 742.0'



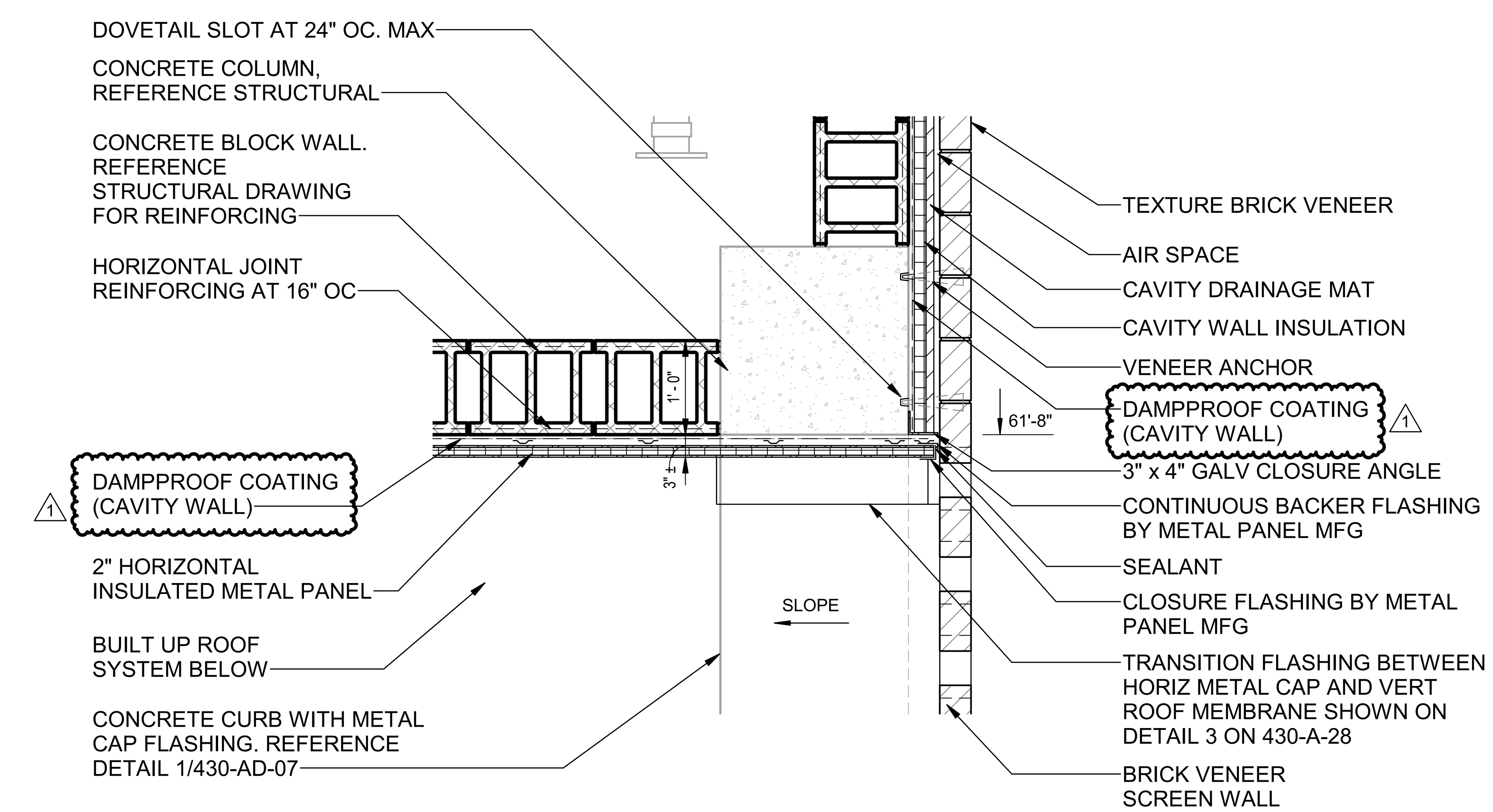
3 430-A-06 PLAN DETAIL A - AT PRECAST - EL 740.0'



5 430-A-06 PLAN DETAIL C - TYP COLUMN ATTACHMENT TO PRECAST, IMP, AND BRICK



6 430-A-06 PLAN DETAIL D - PRECAST, IMP, AND BRICK



7 430-A-08 PLAN DETAIL E - SCREEN WALL AT BRICK

0 1' 2' 3'
SCALE : 3/4" = 1'-0"

Plot Date: 8/13/2025 10:33:13 AM Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt

Designed by:	S.GRAMKOW
Drawn by:	S.GRAMKOW
Checked by:	D.WALDROP

REVISION

REV No.	DATE	DESCRIPTION	APPV
0	5/16/25	ISSUE FOR BID	CKM
1	08/15/25	ADD. 9 - REVISED DAMPPROOFING AND VAPOR BARRIERS	CKM

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Signer Name: Christine Mondor
Signing Reason: I approved this document.
Signing Time: 2025-08-19 10:46:47(EDT)

REGISTERED ARCHITECT PENNSYLVANIA CHRISTINE MONDOR No. RA013577 15 AUG 2025

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ARLETTA SCOTT WILLIAMS
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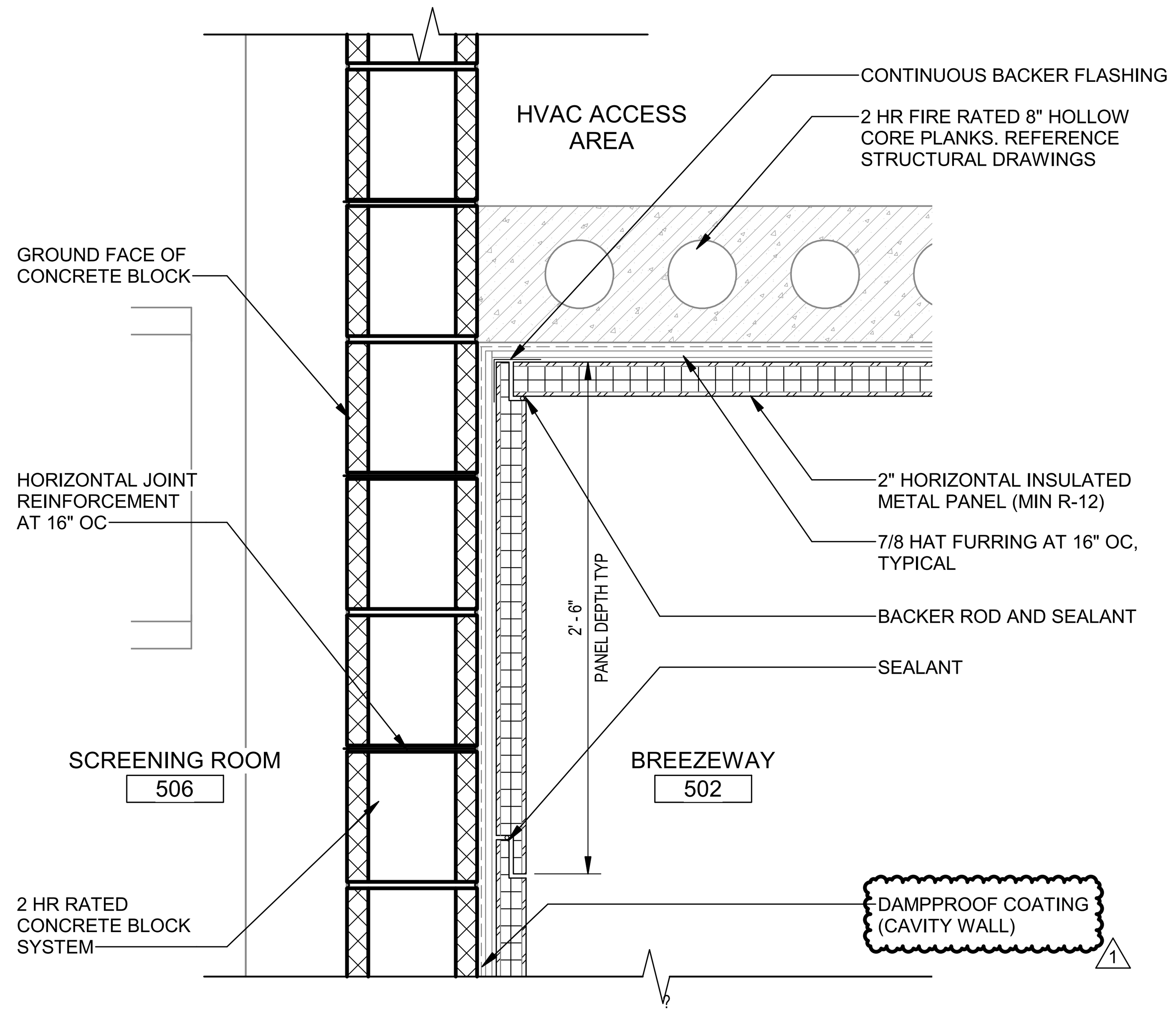
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

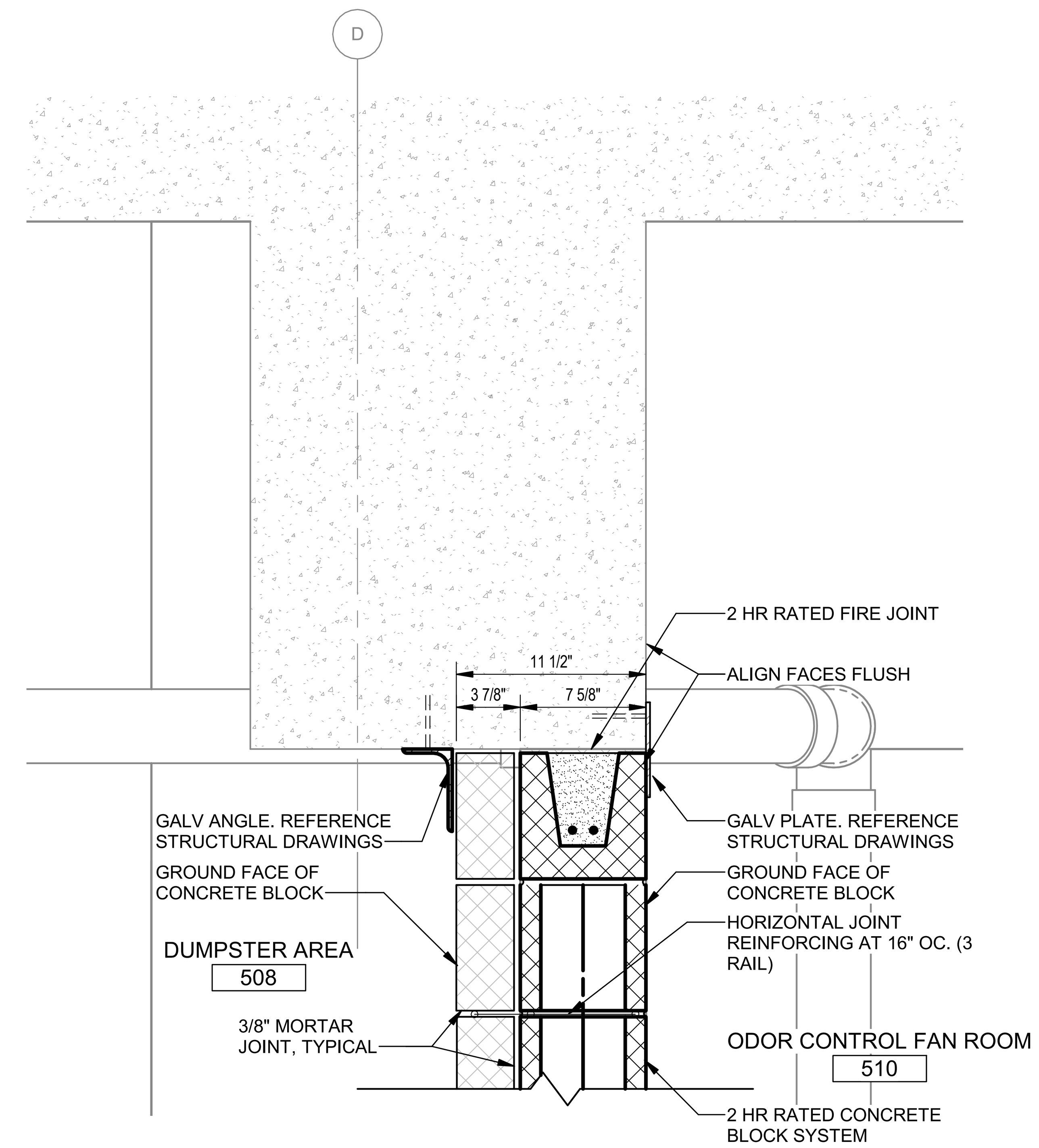
430-A-32
ENLARGED PLAN DETAILS

Contract:	1800
CAD File Name:	
Date:	5/16/2025
Sheet:	83 of 405

Plot Date: 8/13/2025 10:33:20 AM Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt

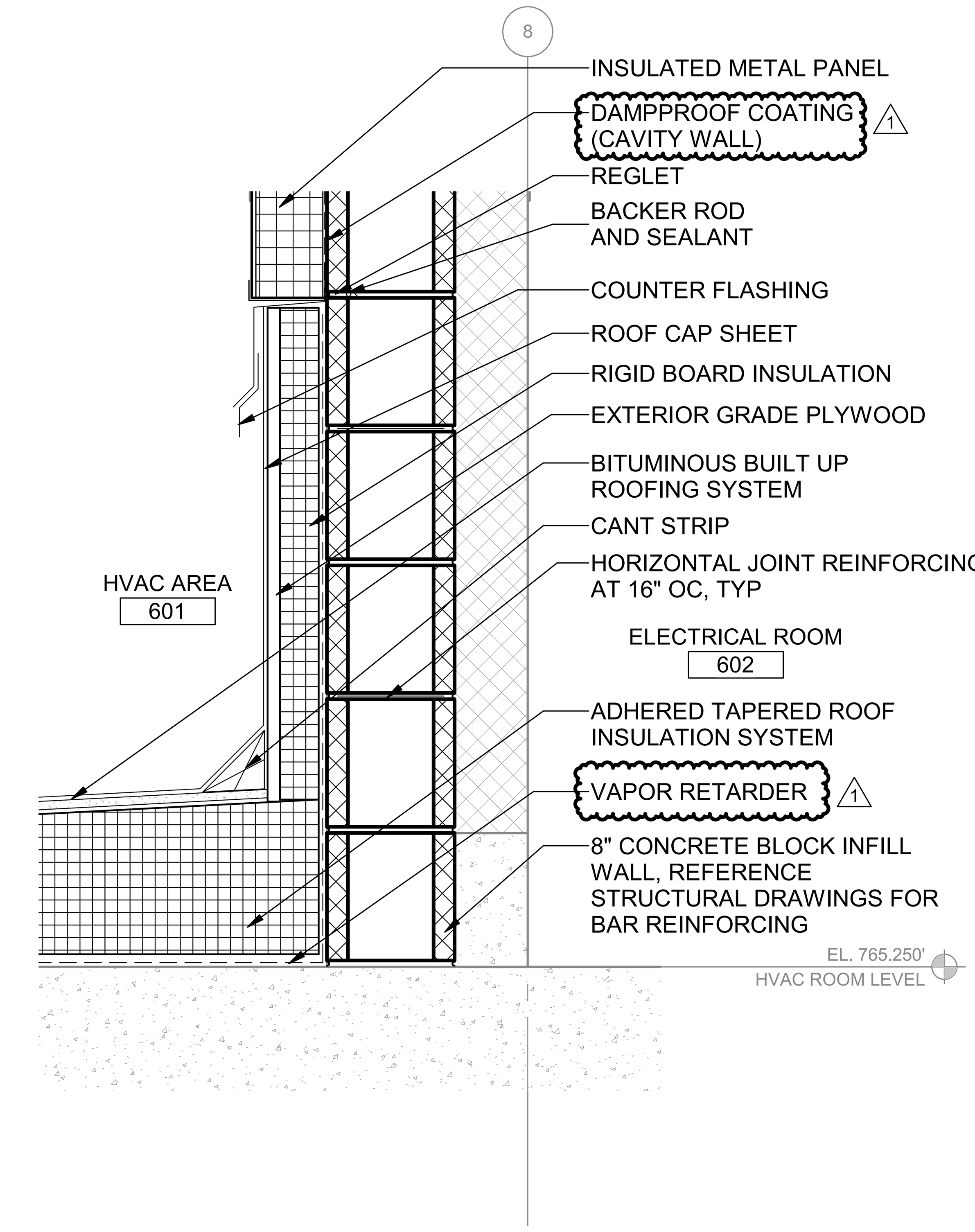


1 BUILDING SECTION - A - DETAIL
430-A-29



NOTE: REFERENCE STRUCTURAL DETAILS FOR FURTHER INFORMATION

2 TOP OF WALL DETAIL
430-A-27



3 HVAC BASE OF WALL DETAIL
430-A-28

Signer Name: Christine Mondor
Signing Reason: I approved this document.
Signing Time: 2025-08-18 10:46:47(EDT)

0 1' 2'
SCALE : 1 1/2" = 1'-0"

Designed by:	S.GRAMKOW
Drawn by:	S.GRAMKOW
Checked by:	D.WALDROP

REVISION

REV No.	DATE	DESCRIPTION	APPV
0	5/16/25	ISSUE FOR BID	CKM
1	08/15/25	ADD. 9 - REVISED DAMPPROOFING AND VAPOR BARRIERS	CKM

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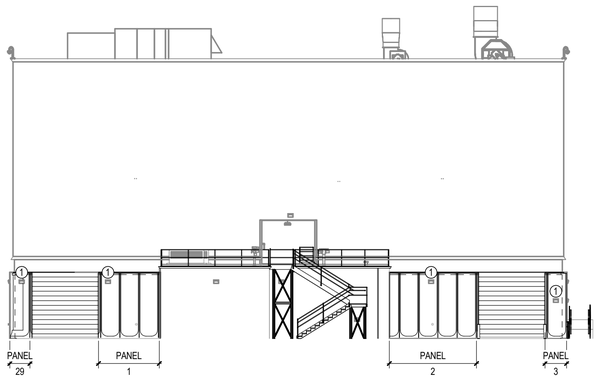
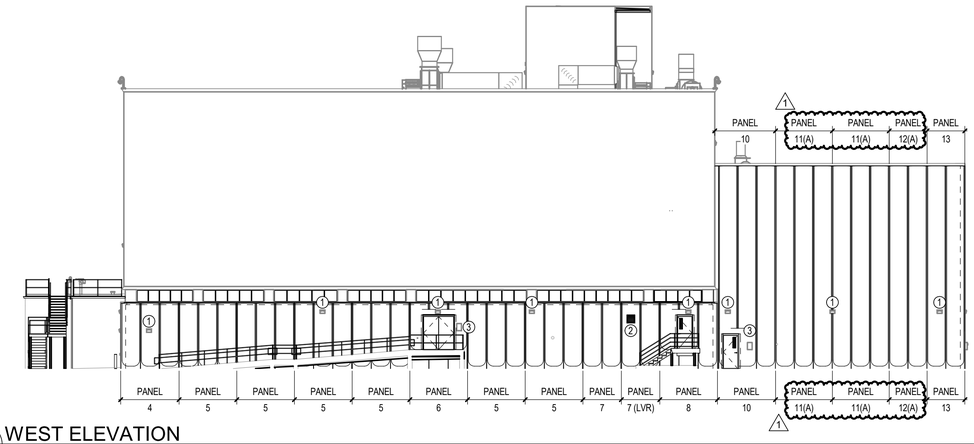
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-A-33
ENLARGED SECTION DETAILS

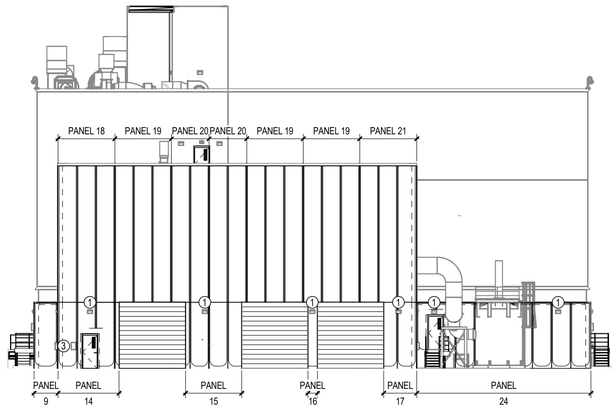
Contract: 1800
CAD File Name:
Date: 5/16/2025
Sheet: 84 of 405



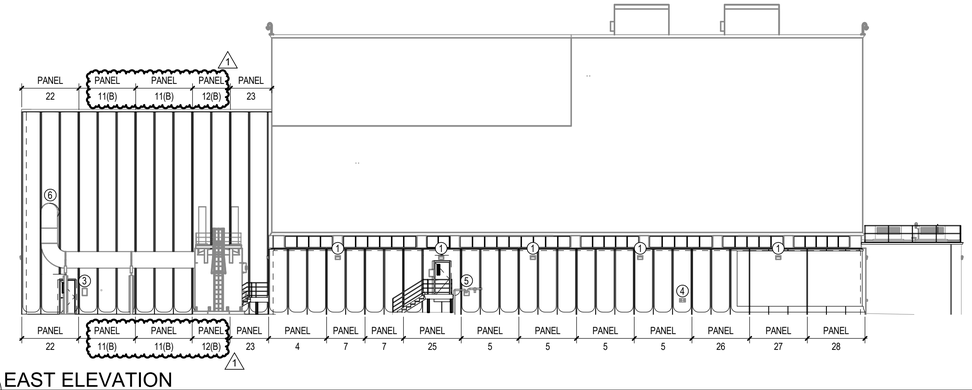
1 NORTH ELEVATION
430-A-06



4 WEST ELEVATION
430-A-06



2 SOUTH ELEVATION
430-A-07



3 EAST ELEVATION
430-A-06

CONCRETE PANEL & SPECIALTY MASONRY SHAPE SHEET INDEX:

1. SEE SHEET 430-A-35 FOR PANEL 1-9
2. SEE SHEET 430-A-36 FOR PANEL 10-13
3. SEE SHEET 430-A-37 FOR PANEL 14-21
4. SEE SHEET 430-A-38 FOR PANEL 22-25
5. SEE SHEET 430-A-39 FOR PANEL 26-29
6. SEE SHEET 430-A-XX FOR BRICK EXPANSION JOINTS
7. SEE SHEET 430-A-40 FOR SPECIAL MASONRY SHAPES
8. SEE SHEET 430-A-41 FOR SPECIAL MASONRY LAYOUT (NORTH)
9. SEE SHEET 430-A-42 FOR SPECIAL MASONRY LAYOUT (NORTH)
10. SEE SHEET 430-A-43 FOR SPECIAL MASONRY LAYOUT (SOUTH)
11. SEE SHEET 430-A-44 FOR SPECIAL MASONRY LAYOUT (SOUTH)
12. SEE SHEET 430-A-45 FOR SPECIAL MASONRY LAYOUT (EAST)
13. SEE SHEET 430-A-46 FOR SPECIAL MASONRY LAYOUT (EAST)
14. SEE SHEET 430-A-47 FOR SPECIAL MASONRY LAYOUT (WEST)
15. SEE SHEET 430-A-48 FOR SPECIAL MASONRY LAYOUT (WEST)

GENERAL NOTES:

1. VERIFY ALL CONCRETE PANEL DIMENSIONS IN FIELD

CONCRETE PANEL KEYNOTES

#	DESCRIPTION
1	COORDINATE LIGHT FIXTURE PENTRATION. LIGHTS TO BE CENTER ON CONCRETE PANEL SCALLOP (FLAT SECTION)
2	COORDINATE LOUVER PENTRATION
3	COORDINATE CONTROL PANEL PENETRATION
4	COORDINATE FIRE DEPARTMENT CONNECTION PENETRATION
5	COORDINATE GAS METER PENETRATION
6	COORDINATE DUCT PENETRATION

Christine Mondor
Signer Name: Christine Mondor
Signing Reason: I approved
this document
Signing Time: 2025-08-19
18:46:47(EDT)

0 8' 16' 32'
SCALE : 1/16" = 1'-0"

Plot Date: 8/13/2025 10:33:31 AM
Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt

Designed by:	REVISION			
S.GRAMKOW	REV No.	DATE	DESCRIPTION	APPV
Drawn by:	0	5/16/25	ISSUE FOR BID	CKM
S.GRAMKOW	1	08/15/25	ADD. 9 - REVISED PANEL TYPES	CKM
Checked by:				
D.WALDROP				

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REGISTERED ARCHITECT PENNSYLVANIA CHRISTINE MONDOR No. RA010171 15 Aug 2025

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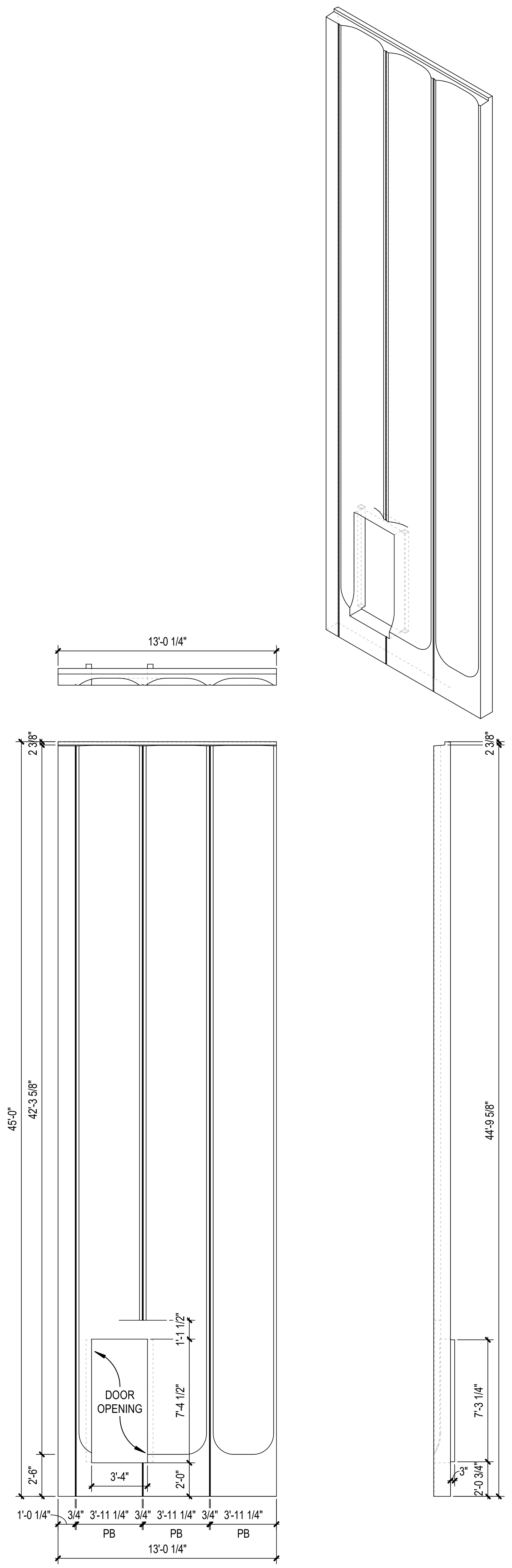
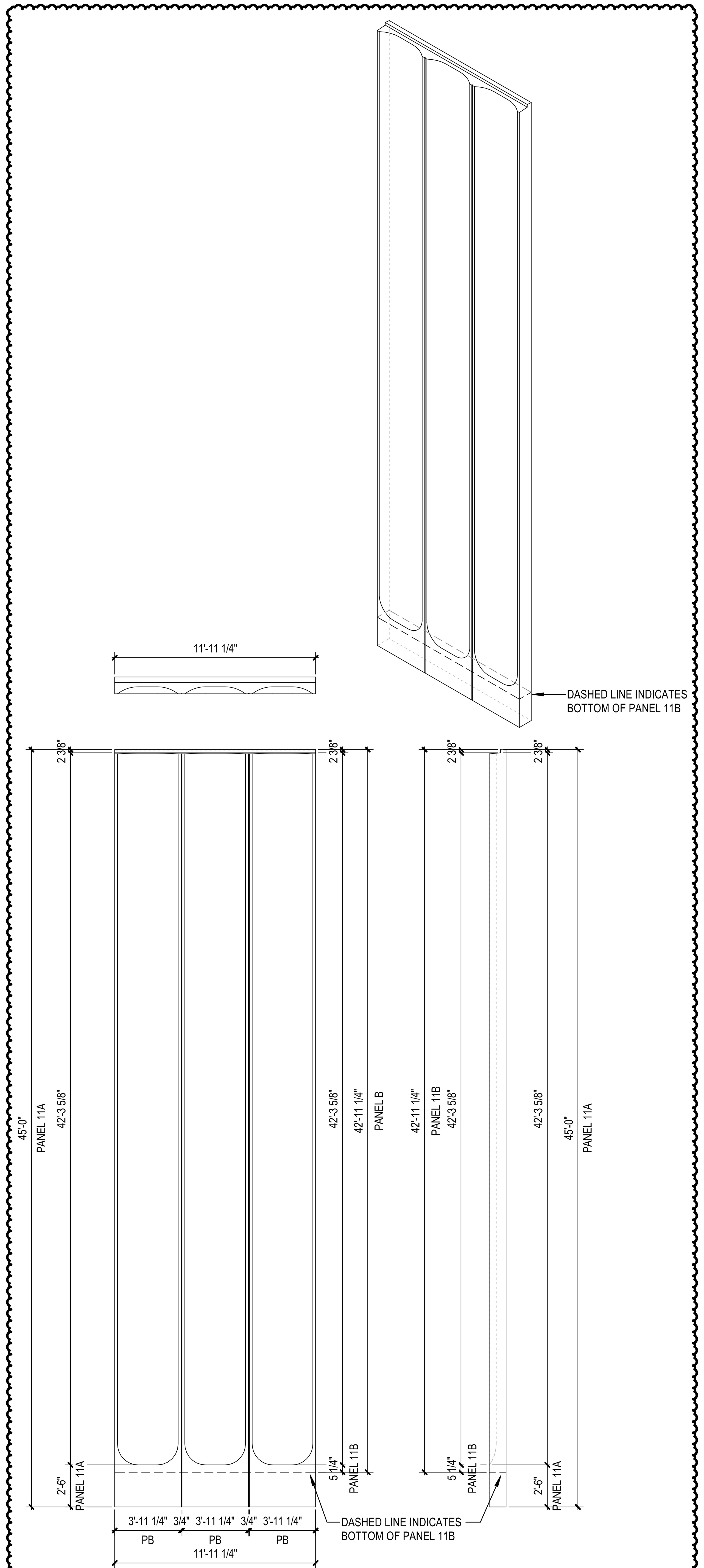
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-A-34
ENLARGED PRECAST ELEVATIONS

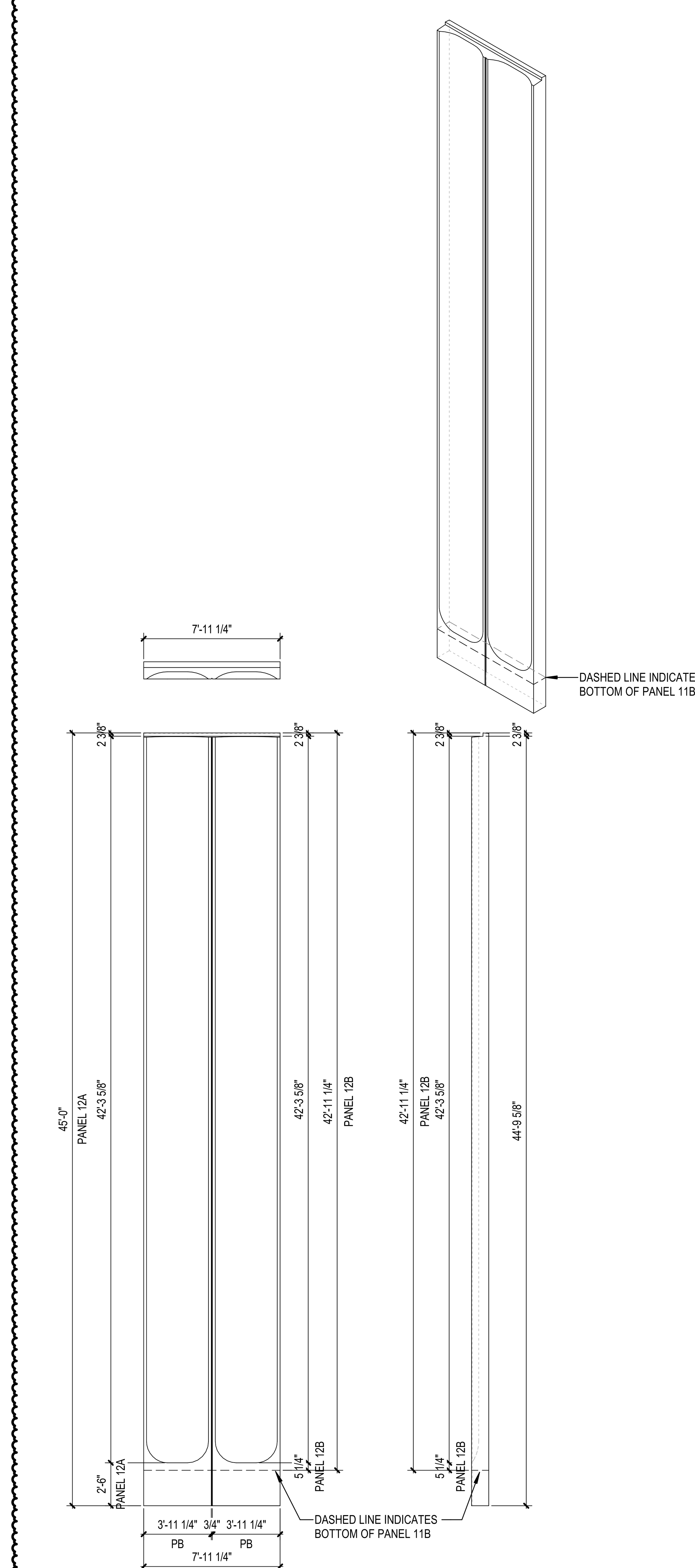
Contract: 1800
CAD File Name:
Date: 5/16/2025
Sheet: 85 of 405



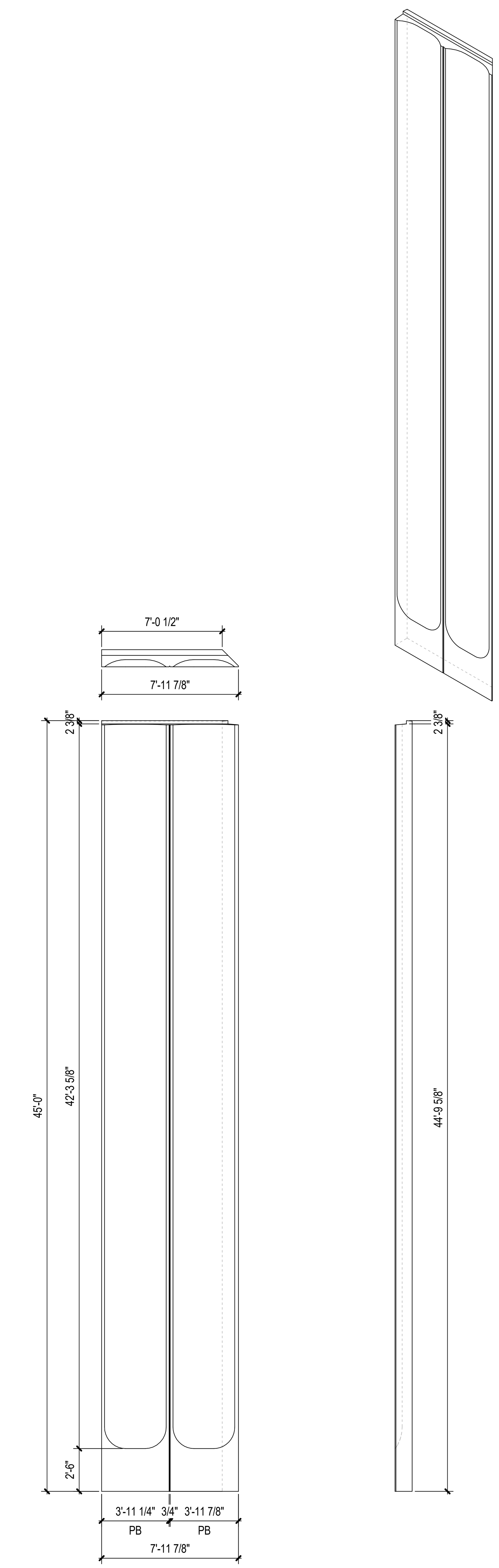
1 PANEL 10
NTS



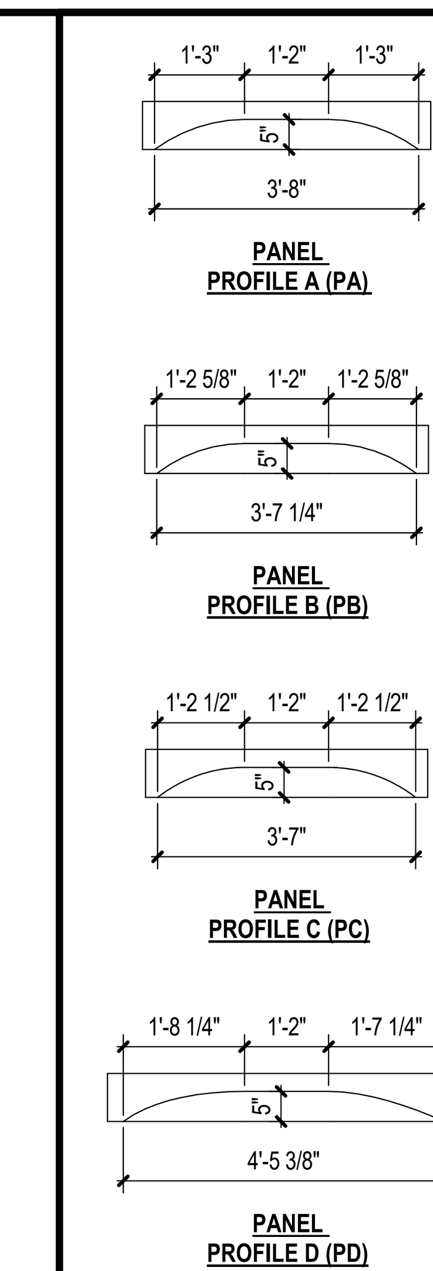
2 PANEL 11(A/B)
NTS



3 PANEL 12(A/B)
NTS



4 PANEL 13
NTS



Plot Date: 8/13/2025 10:33:37 AM Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt

Designed by:	S.GRAMKOW
Drawn by:	S.GRAMKOW
Checked by:	D.WALDROP

REVISION

REV No.	DATE	DESCRIPTION	APPV
0	5/16/25	ISSUE FOR BID	CKM
1	08/15/25	ADD. 9 - REVISED PANEL TYPES	CKM

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Signer Name: Christine Mondor
Signing Reason: I approved this document.
Signing Time: 2025-08-19 10:06:47(EDT)

REGISTERED ARCHITECT PENNSYLVANIA CHRISTINE MONDOR No. RA403537 15 AUG 2025

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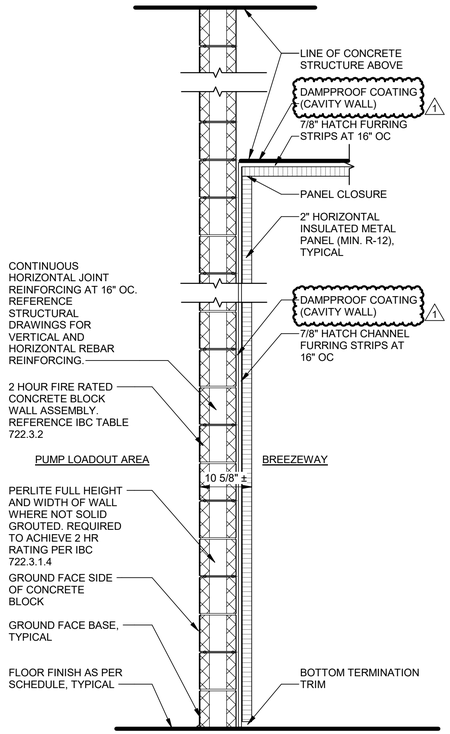
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

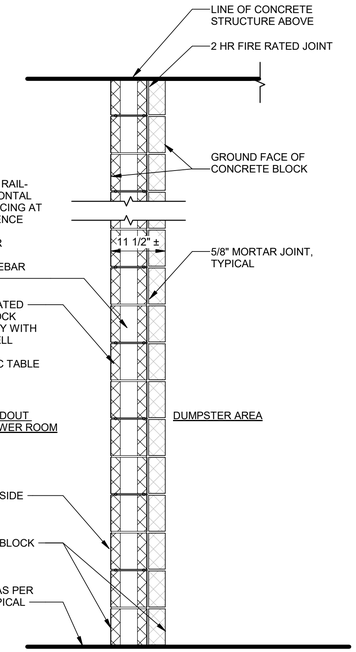
430-A-36
PRECAST PANELS (TYPE 10-13)

Contract: 1800
CAD File Name:
Date: 5/16/2025
Sheet: 87 of 405



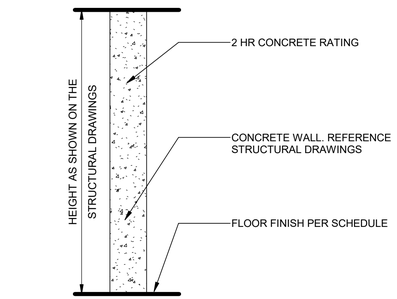
WHERE A1 IS DENOTED, THE CONCRETE BLOCK IS NOT GLAZED.

1 WALL TYPE A, A1
NTS

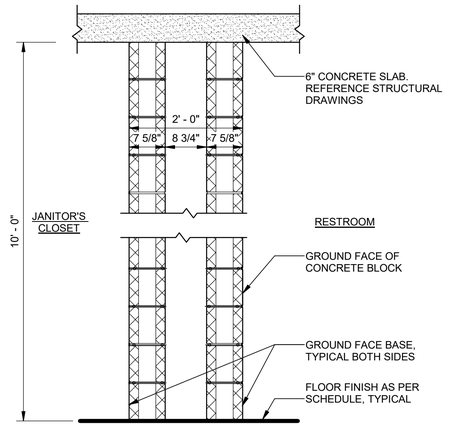


B1 DENOTES A 10'-0" HIGH WALL TO UNDERSIDE OF 6" CONCRETE SLAB.SIMILAR TO WALL TYPE C

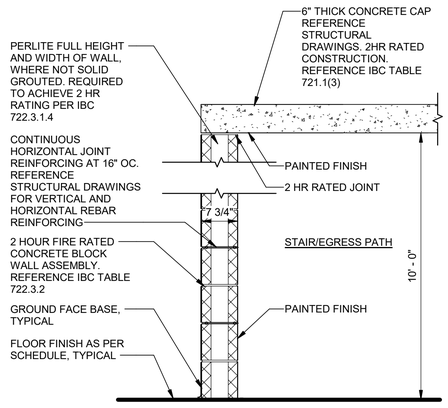
2 WALL TYPE B, B1
NTS



4 WALL TYPE E
NTS

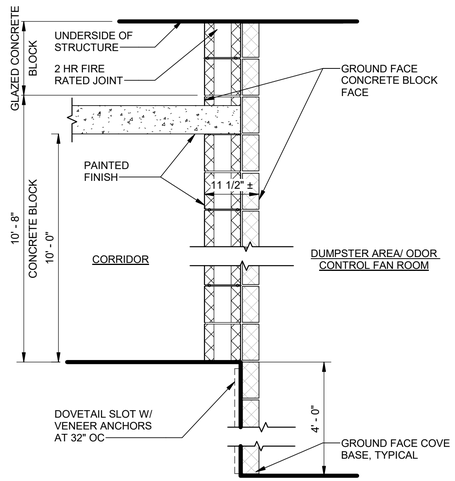


5 WALL TYPE F
NTS



C1 DENOTES WALL SYSTEM EXTEND TO THE UNDERSIDE OF THE STRUCTURE OF NEXT FLOOR ABOVE, SIMILAR TO WALL TYPE B
C2 DENOTES TYPE C WALL WITH 6" CONCRETE CAP EXTENDING PASS FACE OF GROUNDFACE CONCRETE BLOCK

3 WALL TYPE C, C1, C2
NTS



D1 DENOTES GROUND FACE VENEER EXTENDS DOWN TO FINISHED FLOOR

6 WALL TYPE D, D1
NTS

Christine Mondor
Signer Name: Christine Mondor
Signing Reason: I approved this document.
Signing Time: 2025-08-19 10:46:47[EDT]

Plot Date: 8/13/2025 10:33:42 AM Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt

Designed by:	REVISION			
B.GOMEZ	REV No.	DATE	DESCRIPTION	APPV
Drawn by:	0	5/16/25	ISSUE FOR BID	CKM
D.DIDASA	1	08/15/25	ADD. 9 - REVISED DAMPPROOFING AND VAPOR BARRIERS	CKM
Checked by:				
D.WALDROP				

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REGISTERED ARCHITECT PENNSYLVANIA CHRISTINE MONDOR No. RA-021577 15 AUG 2025

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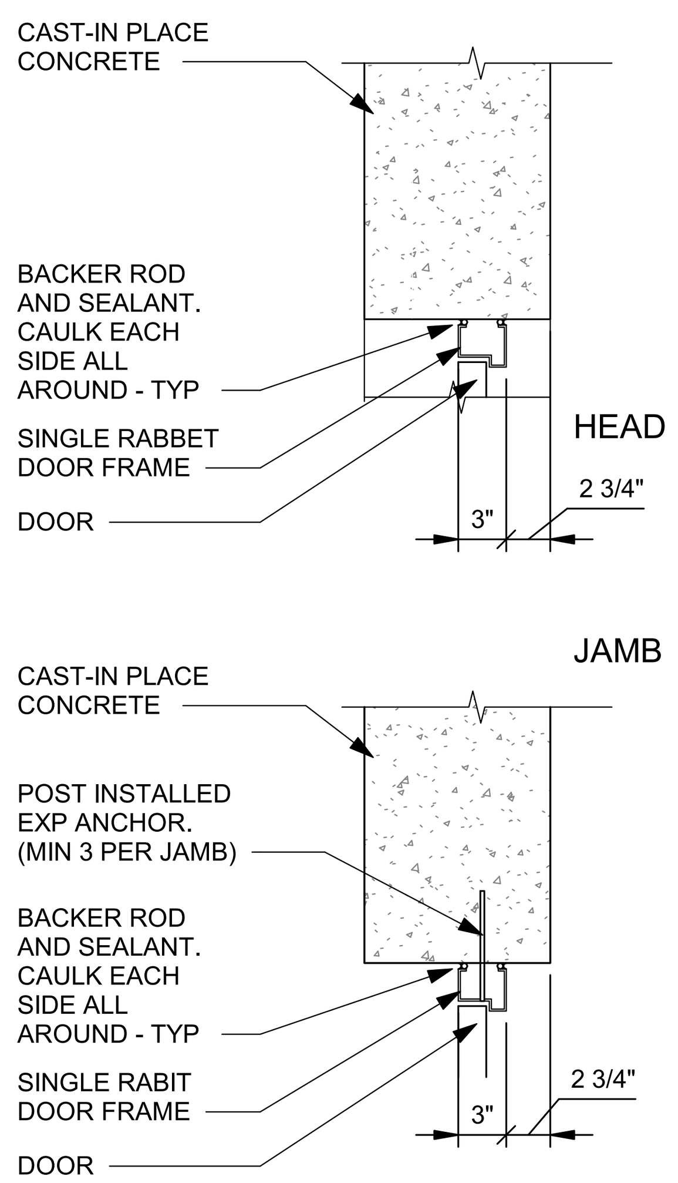
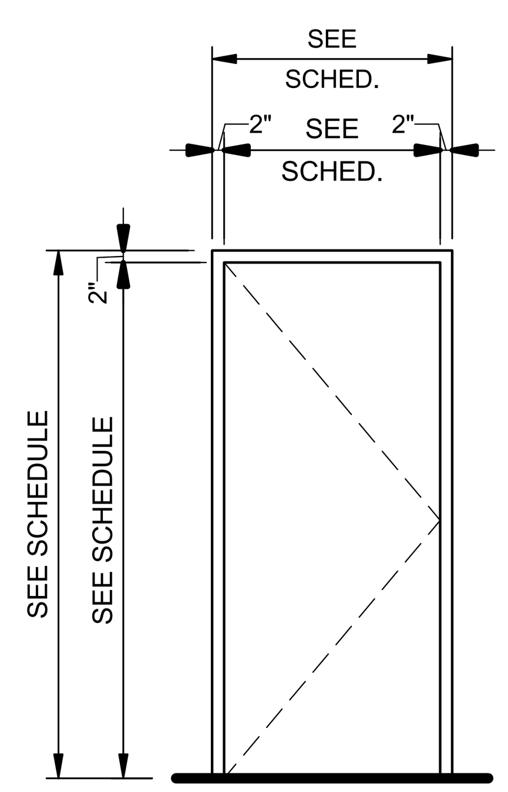
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-AD-01
WALL AND PARTITION TYPES

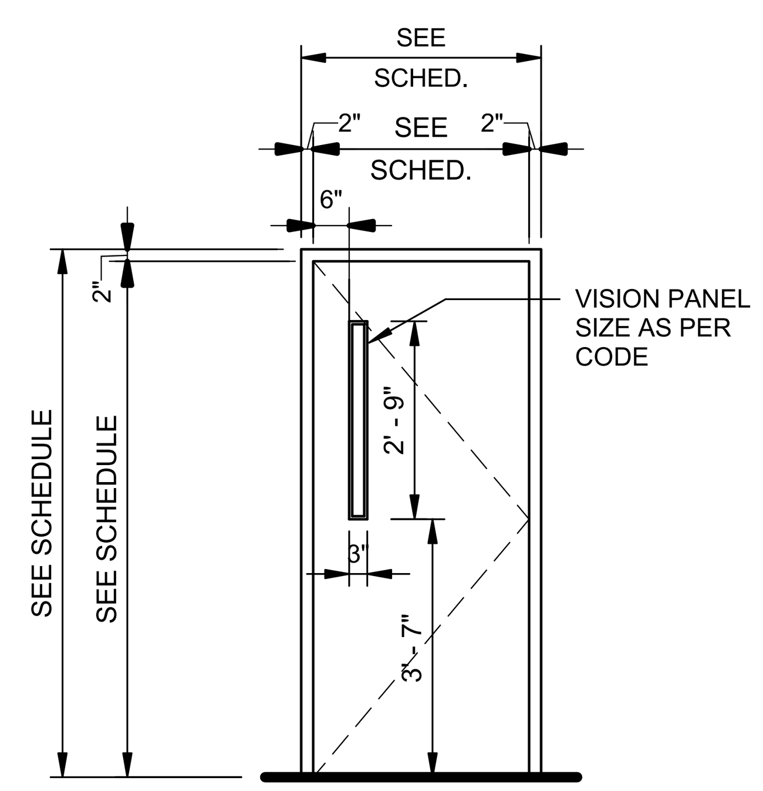
Contract: 1800
CAD File Name:
Date: 5/16/2025
Sheet: 101 of 405



1 ELEVATOR HOISTWAY PERSONEL ACCESS DOOR
NTS

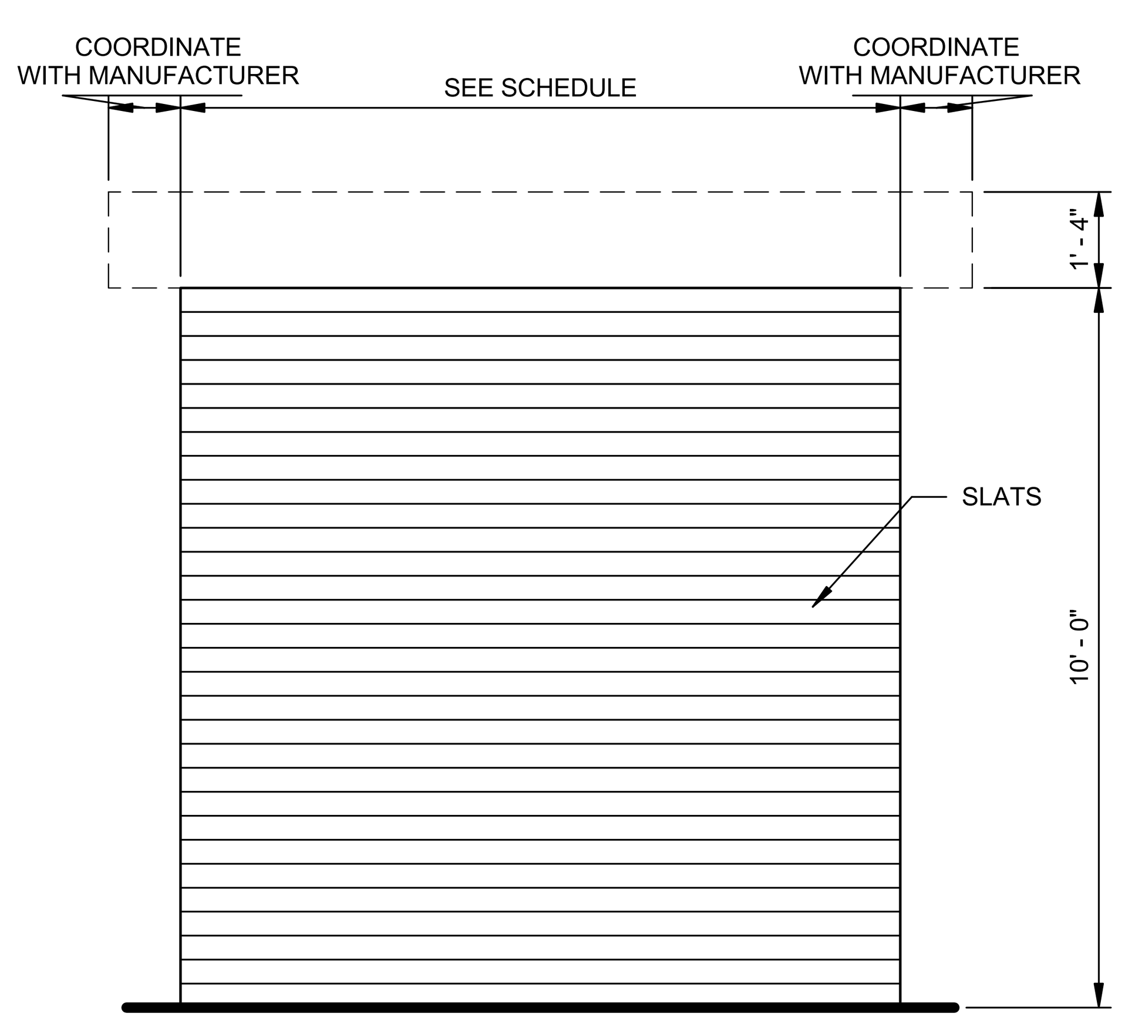


2 DOOR TYPE F
NTS



3 DOOR TYPE NG
NTS

NOTE: PROVIDE SUPER LITE II - XLM 90 VISION PANEL BY SAFTI FIRST OR EQUAL FOR FIRE RATED DOORS



4 DOOR TYPE OH
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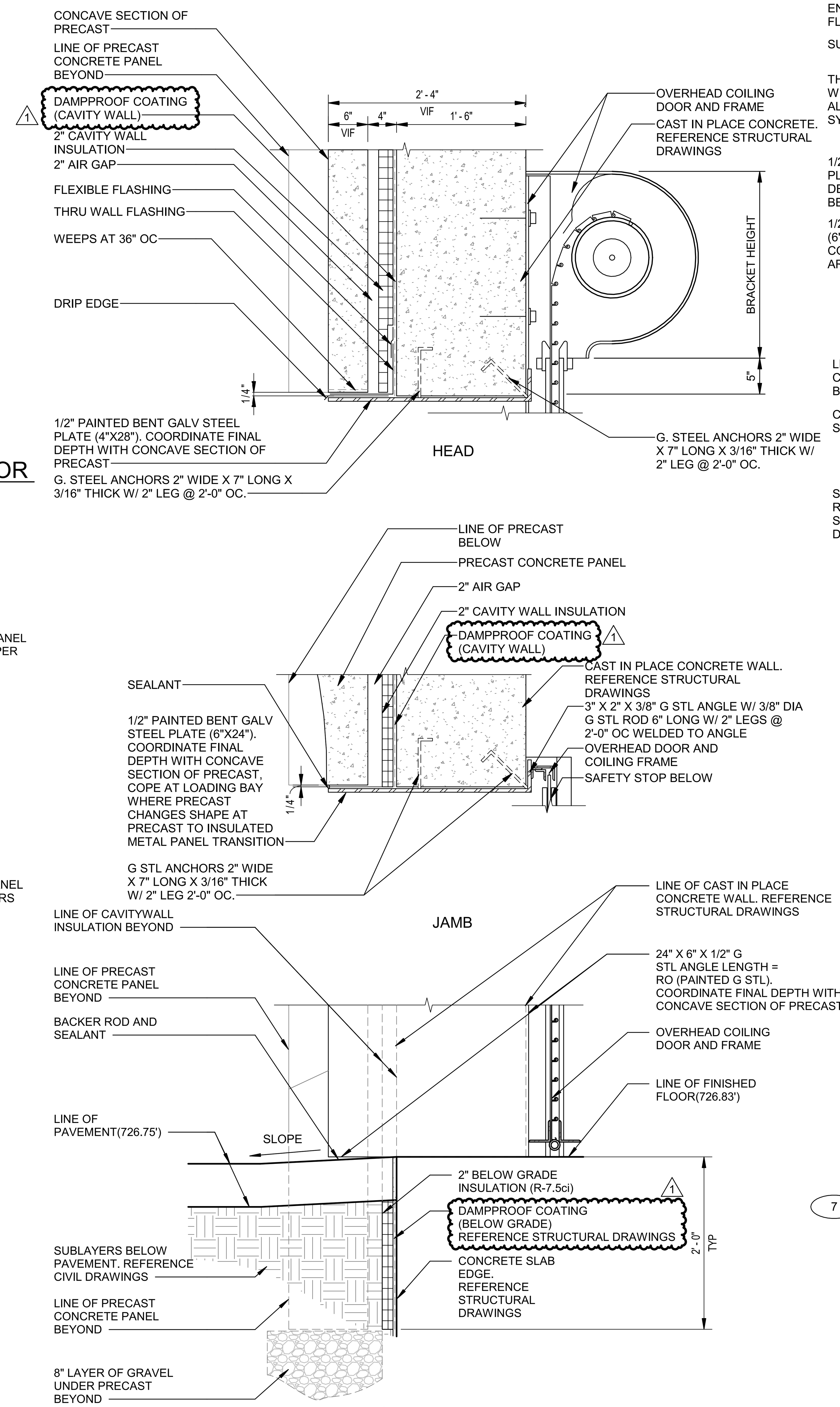

5 OCD AT DUMPSTER BAY
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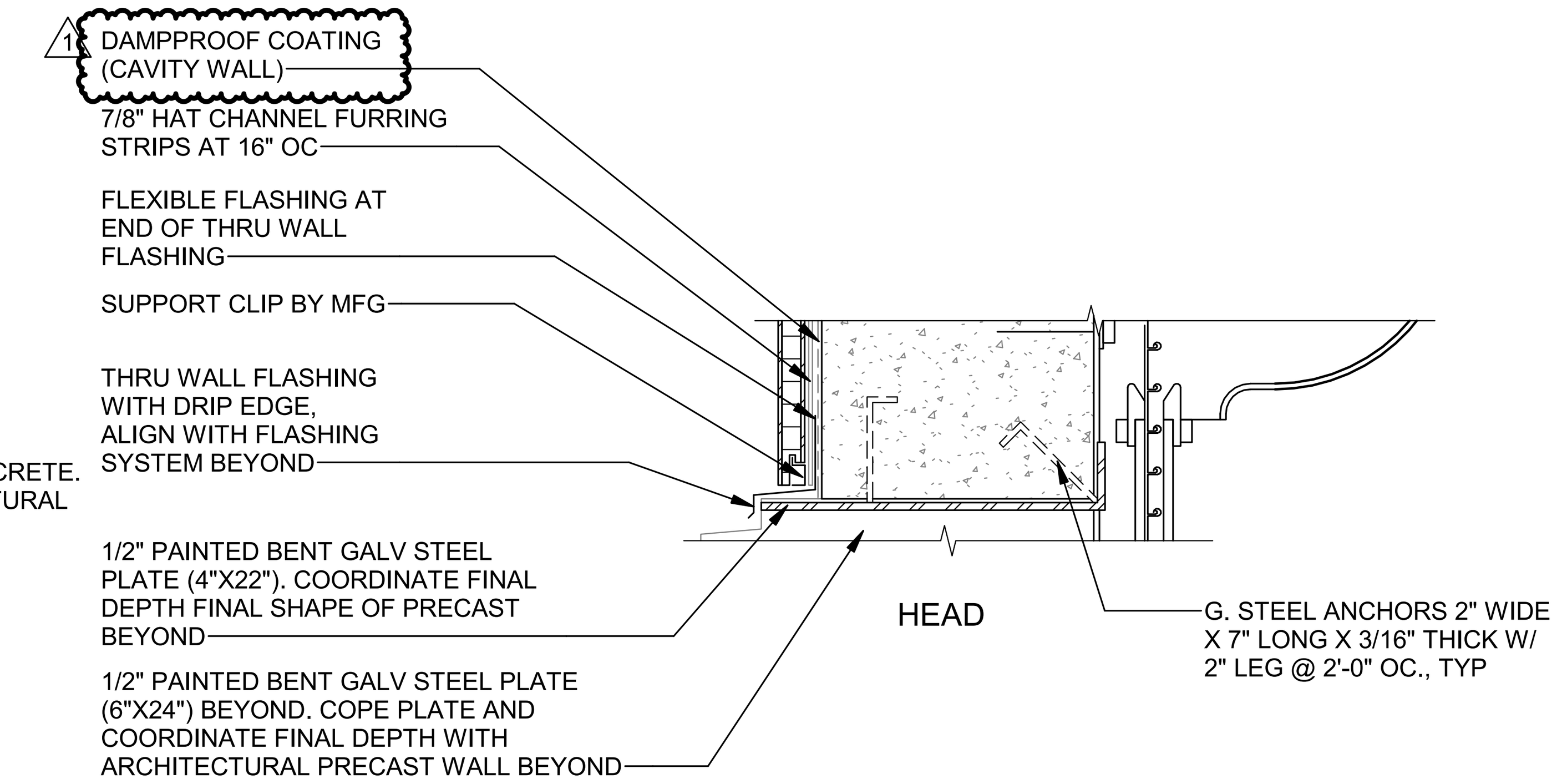
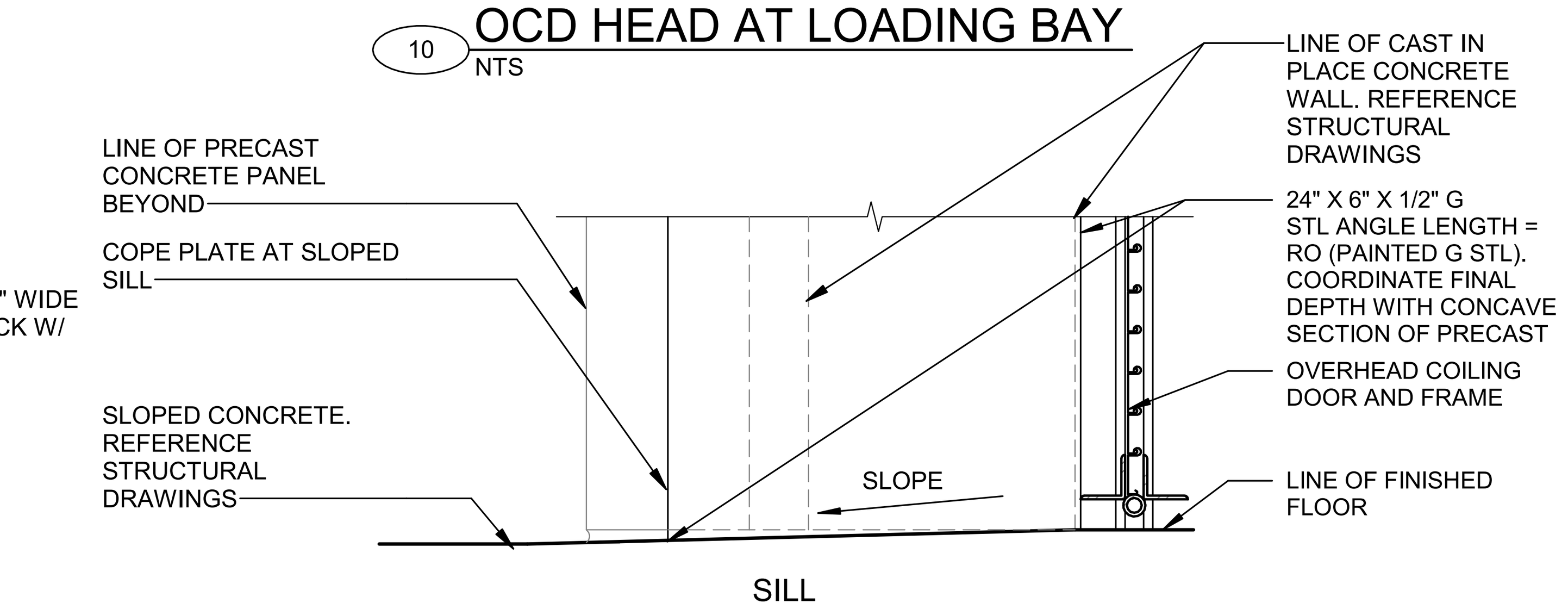
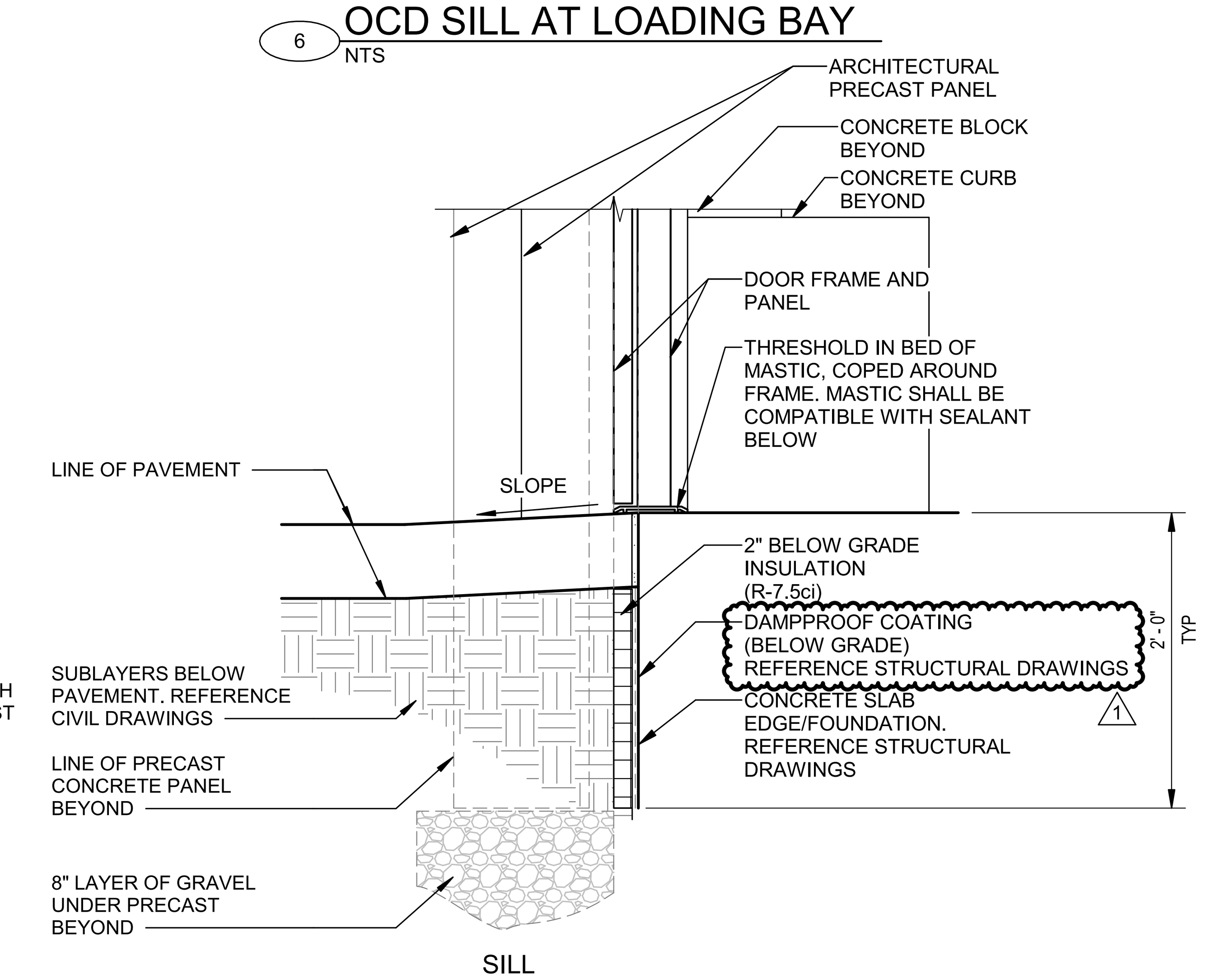


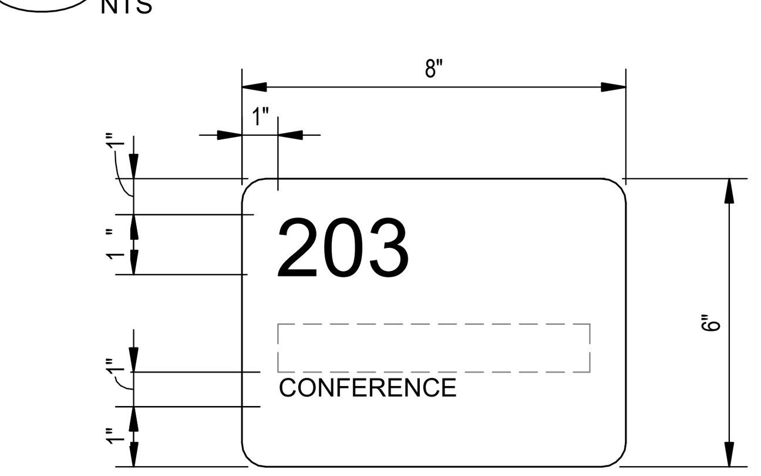
10 OCD HEAD AT LOADING BAY
NTS



6 OCD SILL AT LOADING BAY
NTS



7 PERSONNEL DOOR AT ODOR CONTROL FAN ROOM
NTS



8 ROOM SIGNAGE
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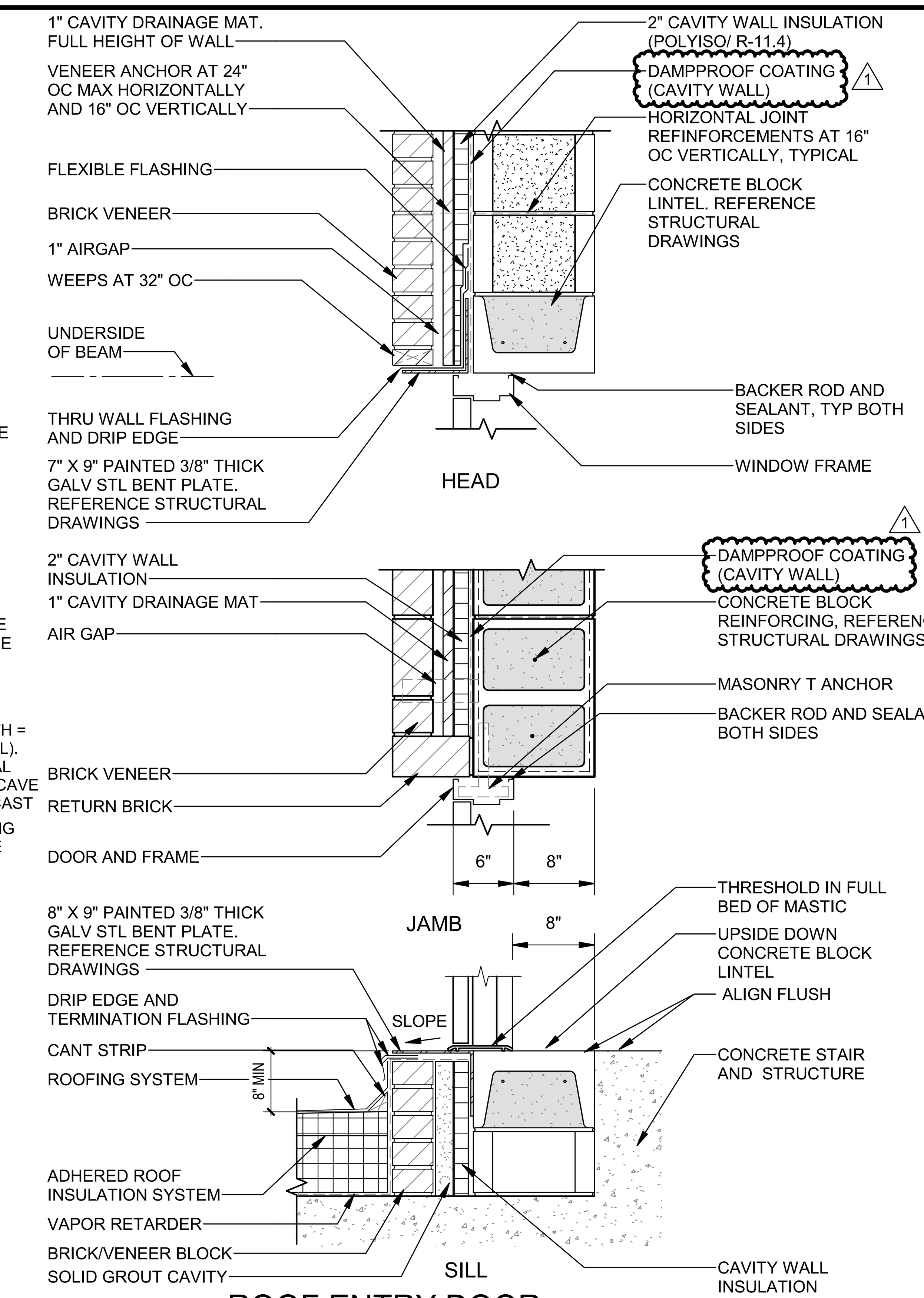
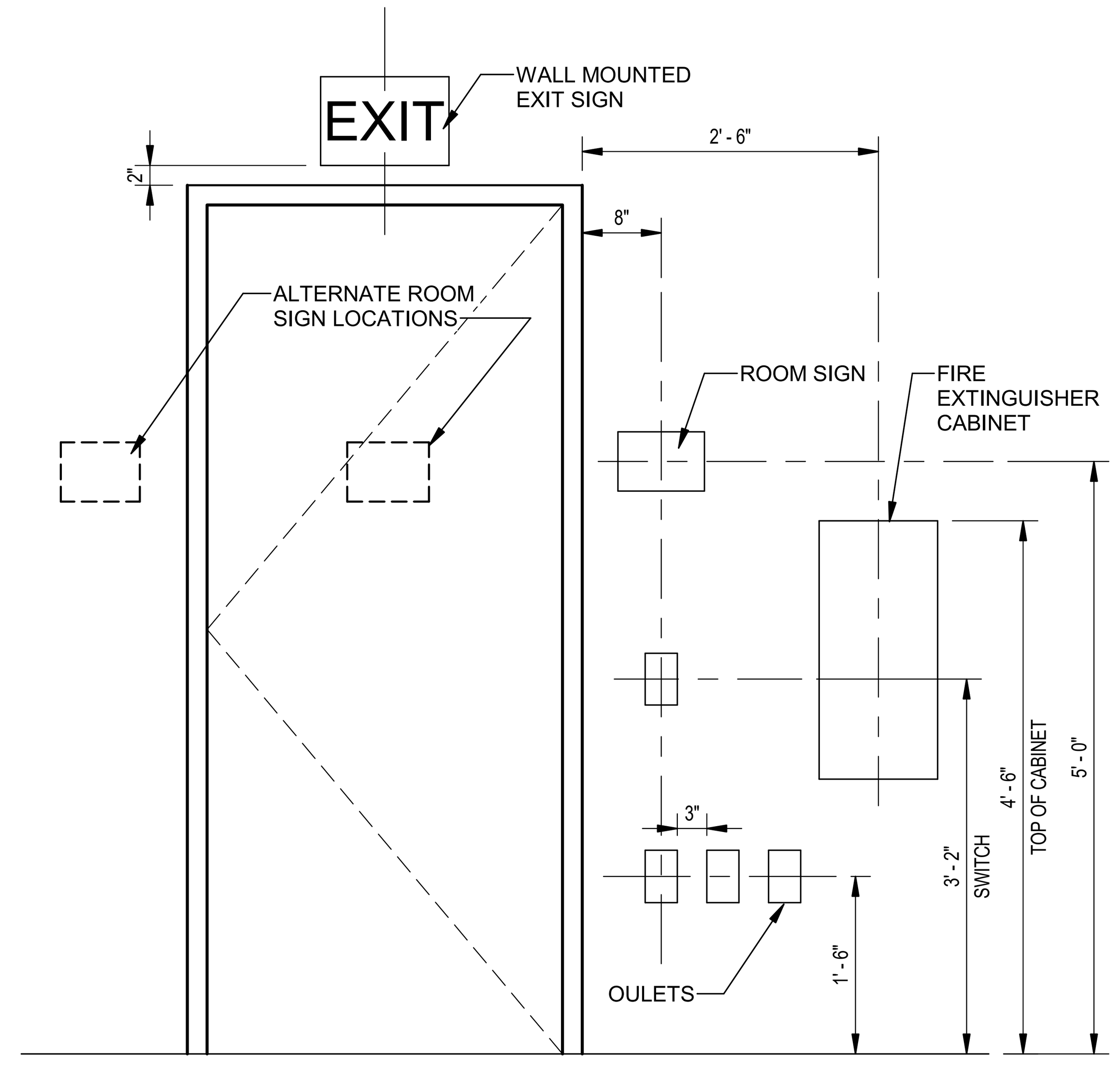


11 ROOF ENTRY DOOR
NTS



9 SIGNAGE LOCATION
NTS

Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt
Plot Date: 8/13/2025 10:33:48 AM

Designed by:	B.GOMEZ
Drawn by:	D.DIDASA
Checked by:	D.WALDROP

REVISION

REV No.	DATE	DESCRIPTION	APPV
0	5/16/25	ISSUE FOR BID	CKM
1	08/15/25	ADD. 9 - REVISED DAMPPROOFING AND VAPOR BARRIERS	CKM

Brown AND Caldwell

evolve environment :: architecture

Signer Name: Christine Mondor
Signing Reason: I approved this document.
Signing Time: 2025-08-19 10:46:47(EDT)

REGISTERED ARCHITECT PENNSYLVANIA CHRISTINE MONDOR No. RA01 5372
15 AUG 2025

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www.alcosan.org

ARLETTA SCOTT WILLIAMS
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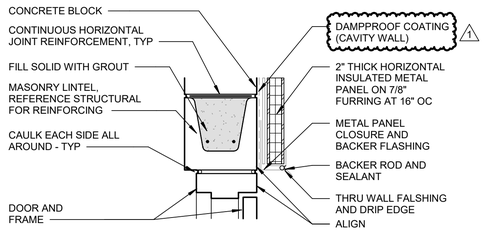
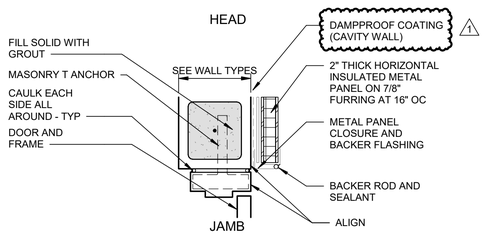
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-AD-02
DOOR DETAILS 1

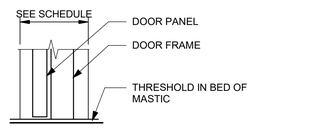
Contract:	1800
CAD File Name:	
Date:	5/16/2025
Sheet:	102 of 405



HEAD



JAMB



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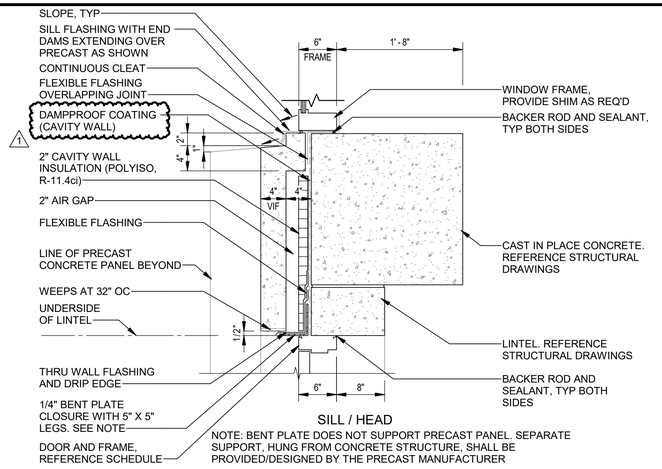
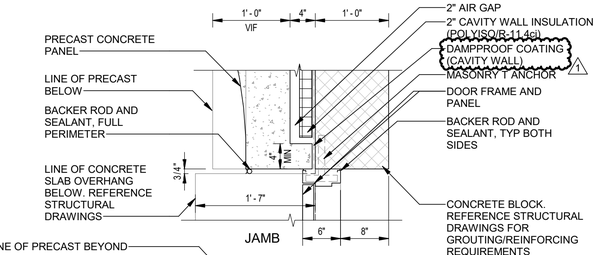


SILL / HEAD

NOTE: BENT PLATE DOES NOT SUPPORT PRECAST PANEL. SEPARATE SUPPORT, HUNG FROM CONCRETE STRUCTURE, SHALL BE PROVIDED/DESIGNED BY THE PRECAST MANUFACTURER



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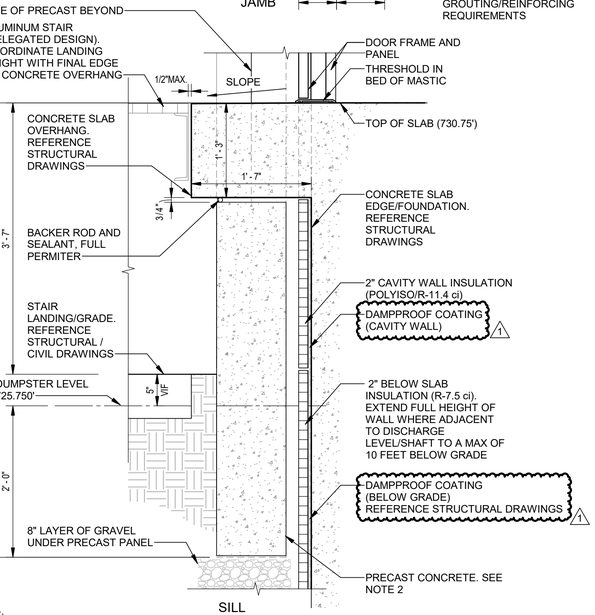


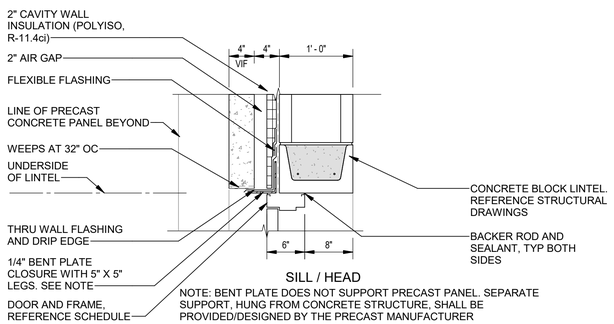
SILL

NOTE:
1. SUPPORT, HUNG FROM CONCRETE STRUCTURE, SHALL BE PROVIDED/DESIGNED BY THE PRECAST MANUFACTURER AND LOCATED 2'-0" MIN. ABOVE GRADE. ARCHITECTURAL PRECAST NOT SUPPORTED BY SLAB BELOW. COORDINATE FINAL PRECAST HEIGHT WITH CONCRETE SLAB BELOW

6 PERSONNEL DOOR AT ODOR CONTROL SLAB
NTS

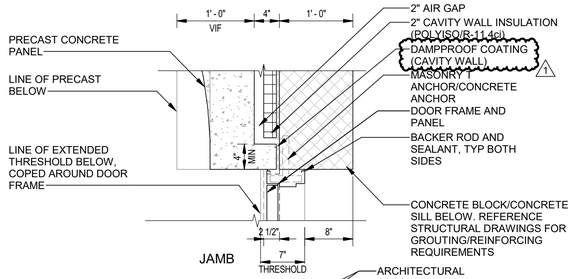
NOTE:
1. SIMILAR DETAIL AT RAMP TO DOOR INTERFACE AT WEST ELEVATION. REFERENCE STRUCTURAL DRAWINGS FOR RAMP DETAILS
2. SUPPORT, HUNG FROM CONCRETE STRUCTURE, SHALL BE PROVIDED/DESIGNED BY THE PRECAST MANUFACTURER AND LOCATED 2'-0" MIN. ABOVE GRADE

2 PERSONNEL DOOR AT ENTRY LEVEL
NTS



SILL / HEAD

NOTE: BENT PLATE DOES NOT SUPPORT PRECAST PANEL. SEPARATE SUPPORT, HUNG FROM CONCRETE STRUCTURE, SHALL BE PROVIDED/DESIGNED BY THE PRECAST MANUFACTURER



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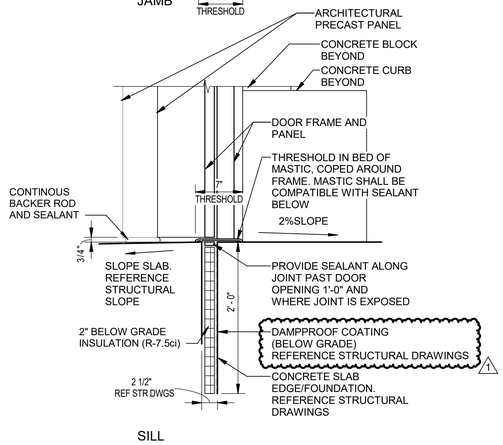

SILL

3 PERSONNEL DOOR AT ODOR CONTROL SLAB
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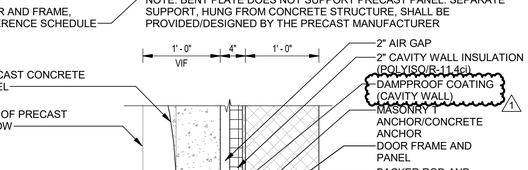
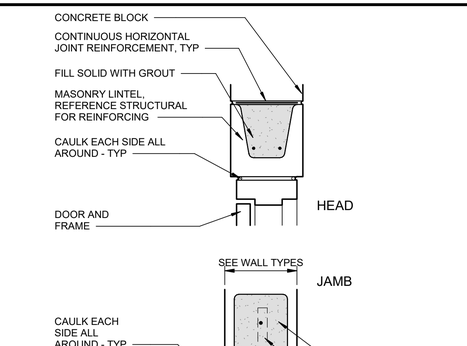


8 THRESHOLD AT ROOF
NTS



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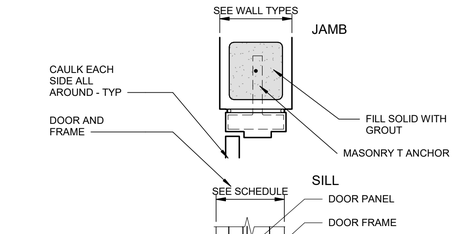

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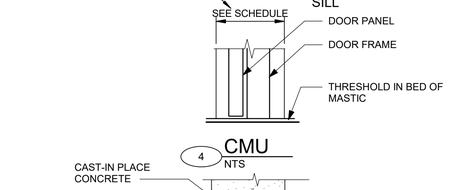
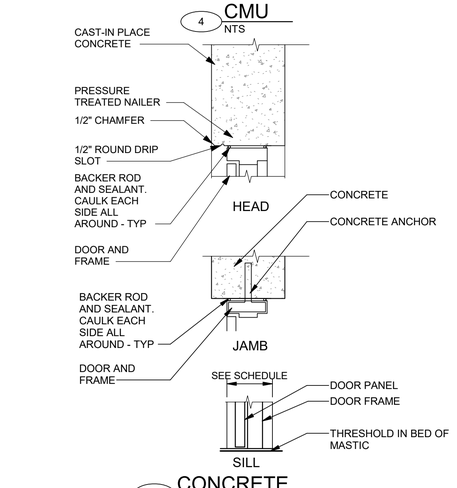
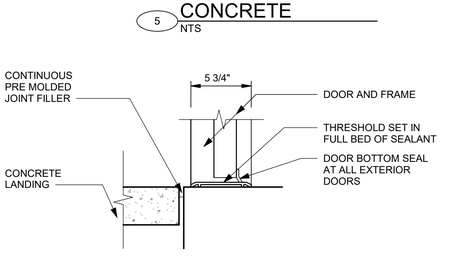


4 CMU
NTS



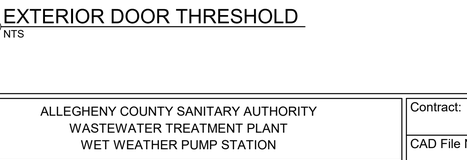
HEAD

JAMB



SILL

5 CONCRETE
NTS



7 EXTERIOR DOOR THRESHOLD
NTS

Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt

Plot Date: 8/13/2025 10:33:55 AM

Designed by:	REVISION			
B.GOMEZ	REV No.	DATE	DESCRIPTION	APPV
Drawn by:	0	5/16/25	ISSUE FOR BID	CKM
D.DIDASA	1	08/15/25	ADD. 9 - REVISED DAMPPROOFING AND VAPOR BARRIERS	CKM
Checked by:				
D.WALDROP				

Brown AND Caldwell

evolve environment :: architecture

Signer Name: Christine Mondor
Signing Reason: I approved this document.
Signing Time: 2025-08-19 10:46:47(EDT)

REGISTERED ARCHITECT COMMONWEALTH OF PENNSYLVANIA CHRISTINE MONDOR No. RA-017577 19 AUG 2025

ARLETTA SCOTT WILLIAMS
EXECUTIVE DIRECTOR, ALCOSAN

3300 PREBLE AVE.
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(412) 766 - 4810

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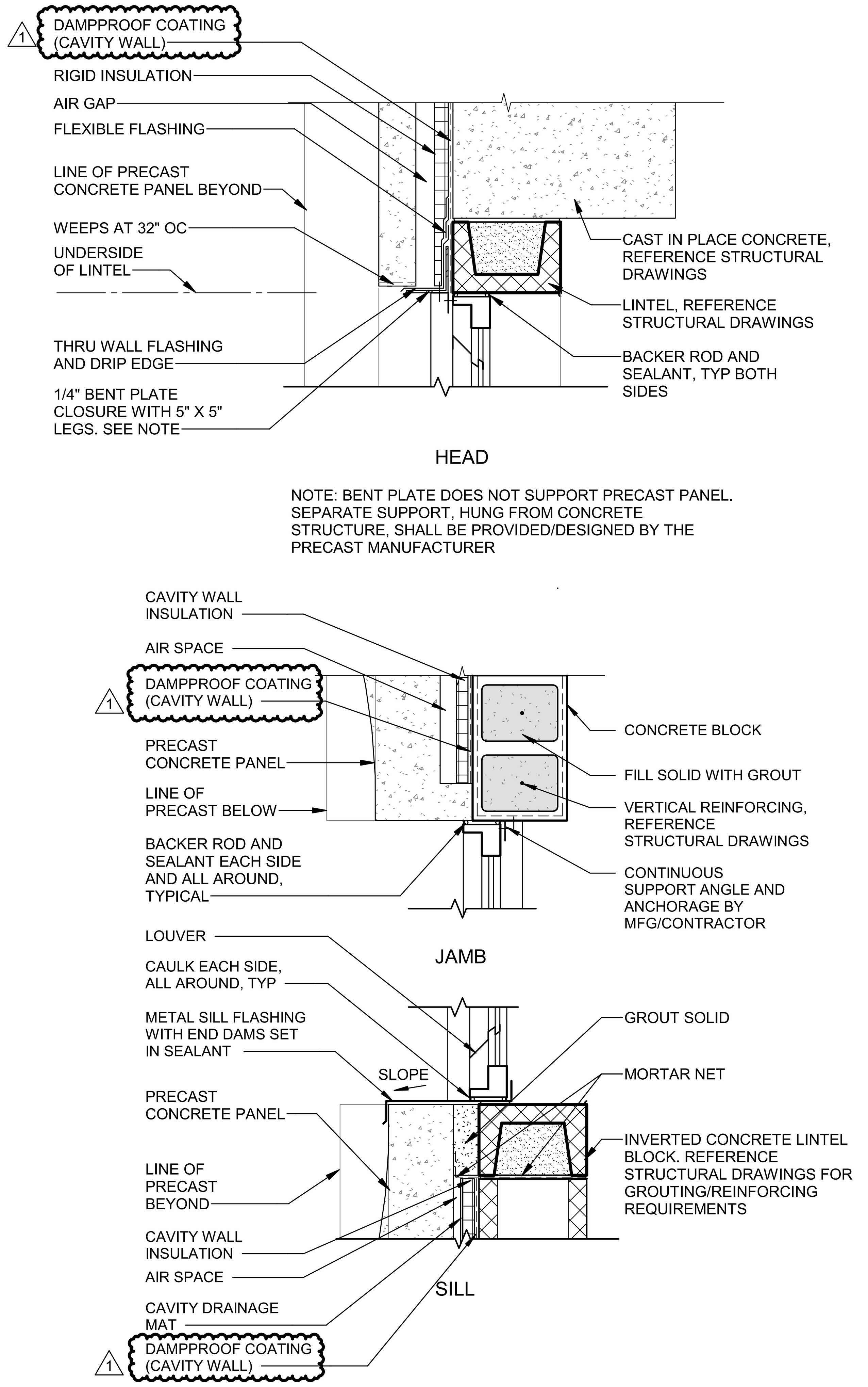
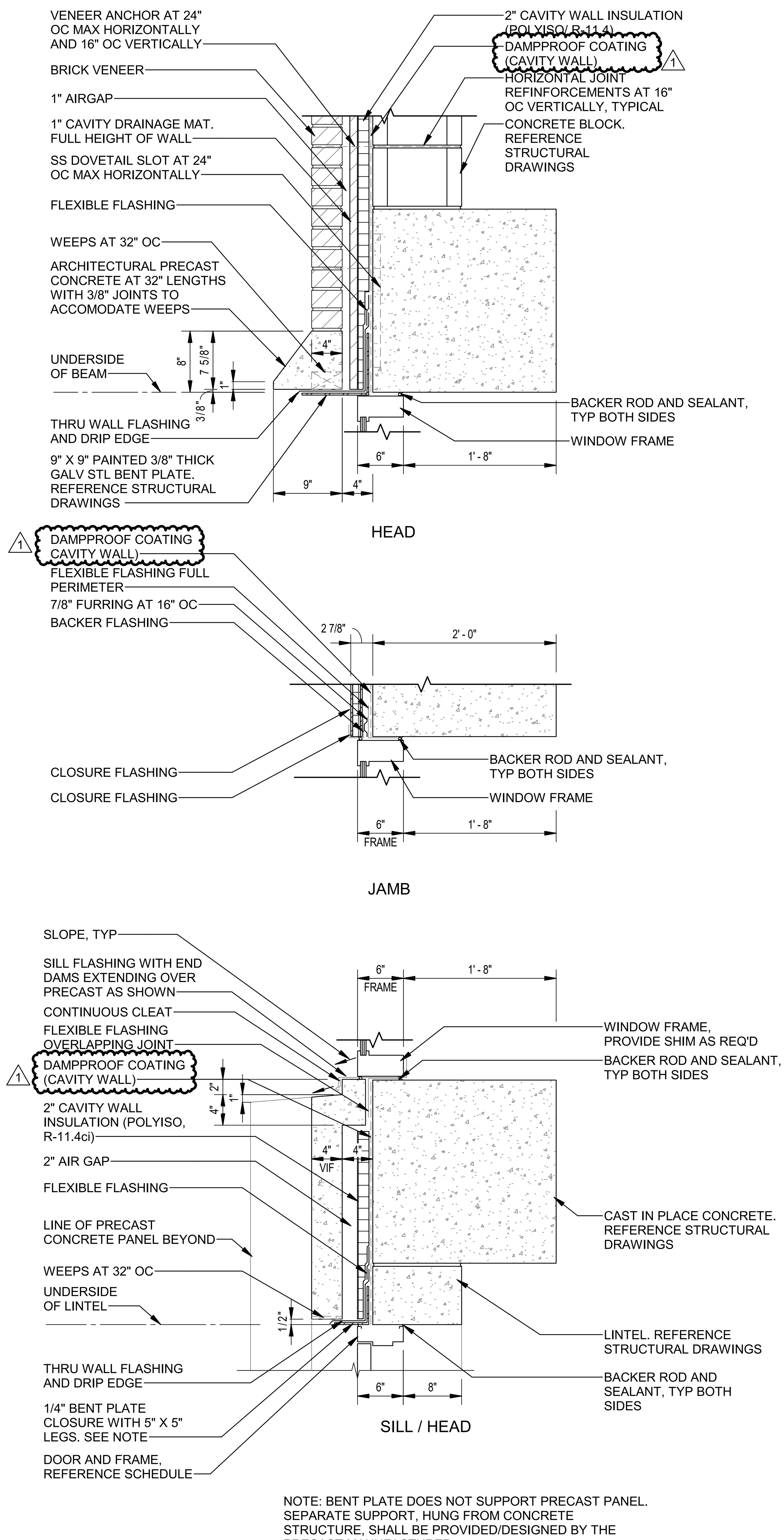
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-AD-03
DOOR DETAILS 2

Contract:	1800
CAD File Name:	
Date:	5/16/2025
Sheet:	103 of 405



1 PRECAST CONCRETE PANEL LOUVER HEAD
NTS



2 WINDOW DETAILS
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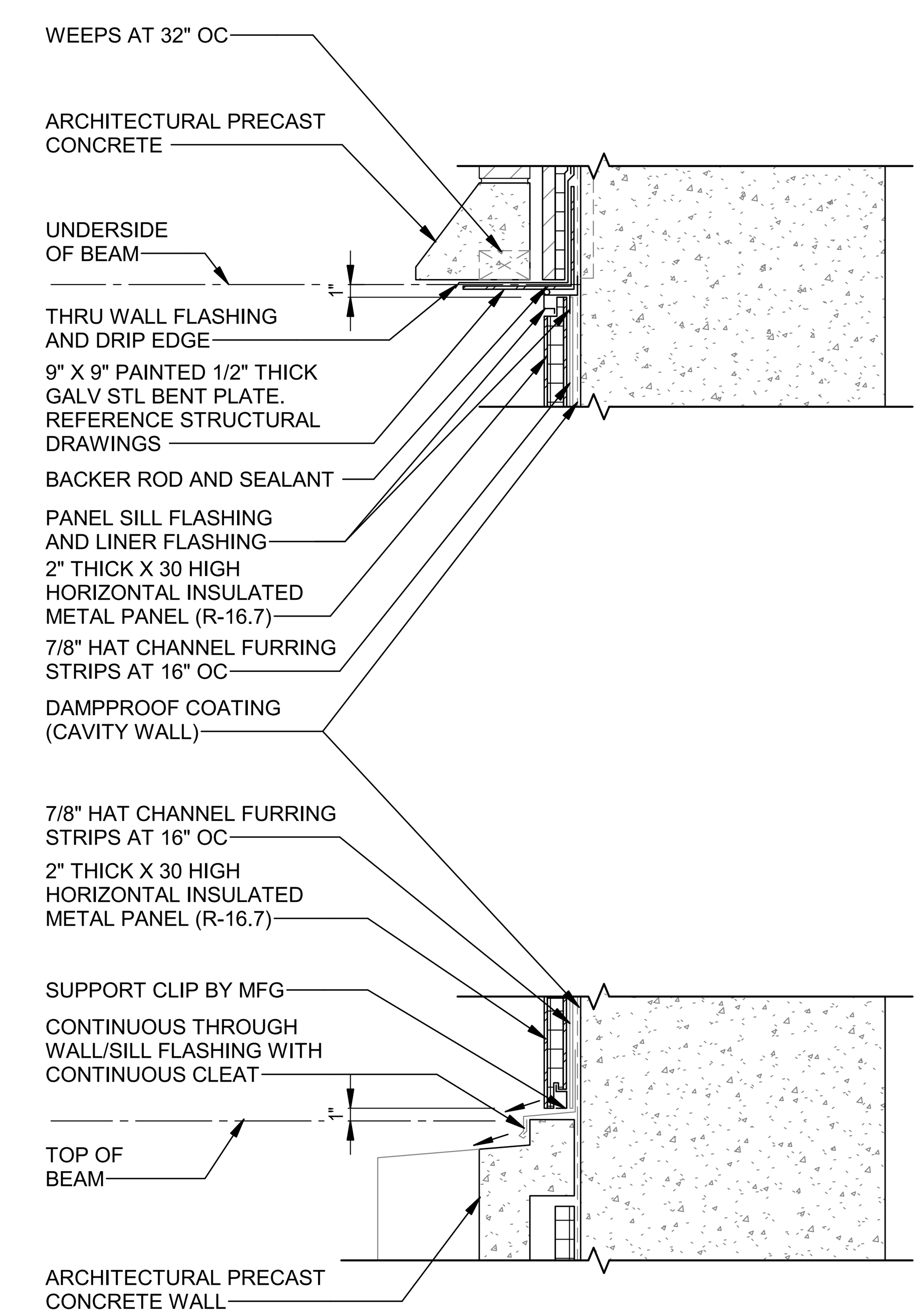
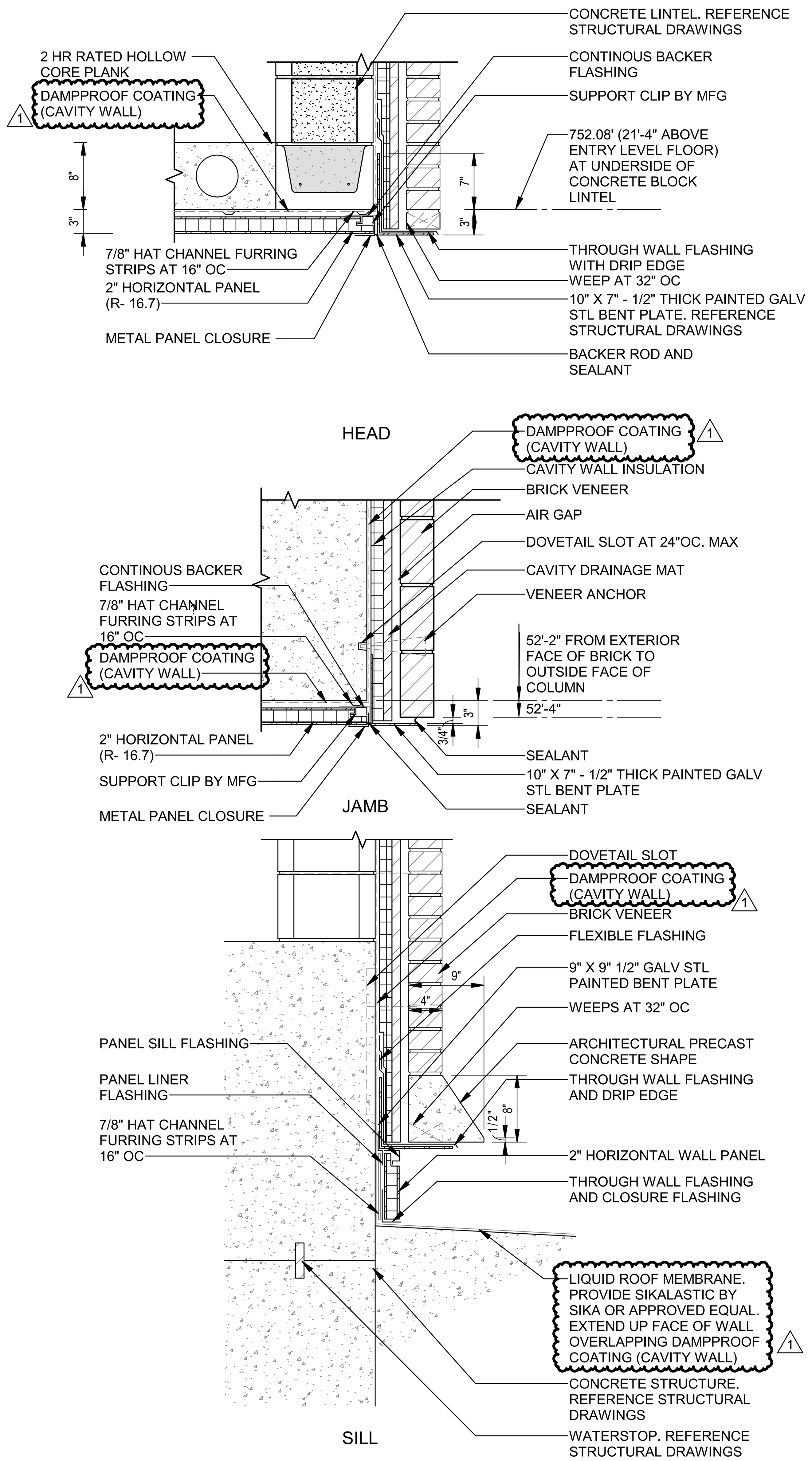
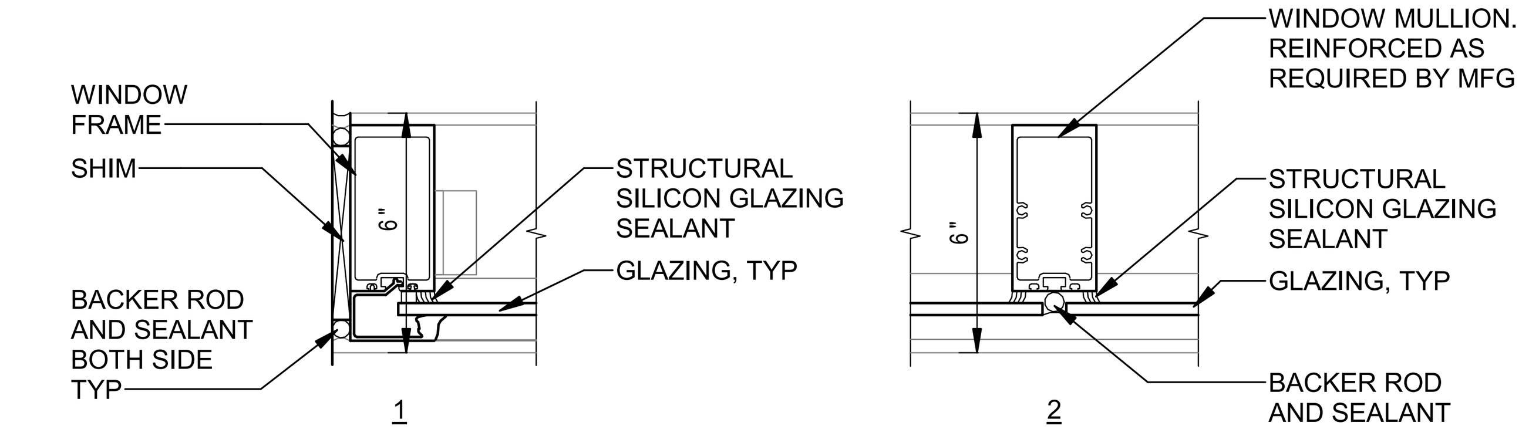


3 HORIZONTAL METAL PANEL
NTS



4 BREEZEWAY OPENING
NTS



5 SSG TYP MULLION/JAMB
NTS

Designed by:	B.GOMEZ
Drawn by:	D.DIDASA
Checked by:	D.WALDROP

REVISION

REV No.	DATE	DESCRIPTION	APPV
0	5/16/25	ISSUE FOR BID	CKM
1	08/15/25	ADD. 9 - REVISED DAMPPROOFING AND VAPOR BARRIERS	CKM

Brown AND Caldwell

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Signer Name: Christine Mondor
Signing Reason: I approved this document.
Signing Time: 2025-08-19 10:46:47(EDT)

REGISTERED ARCHITECT PENNSYLVANIA CHRISTINE MONDOR No. RA403537 19 AUG 2025

alcosan allegheny county sanitary authority

ARLETTA SCOTT WILLIAMS
EXECUTIVE DIRECTOR, ALCOSAN

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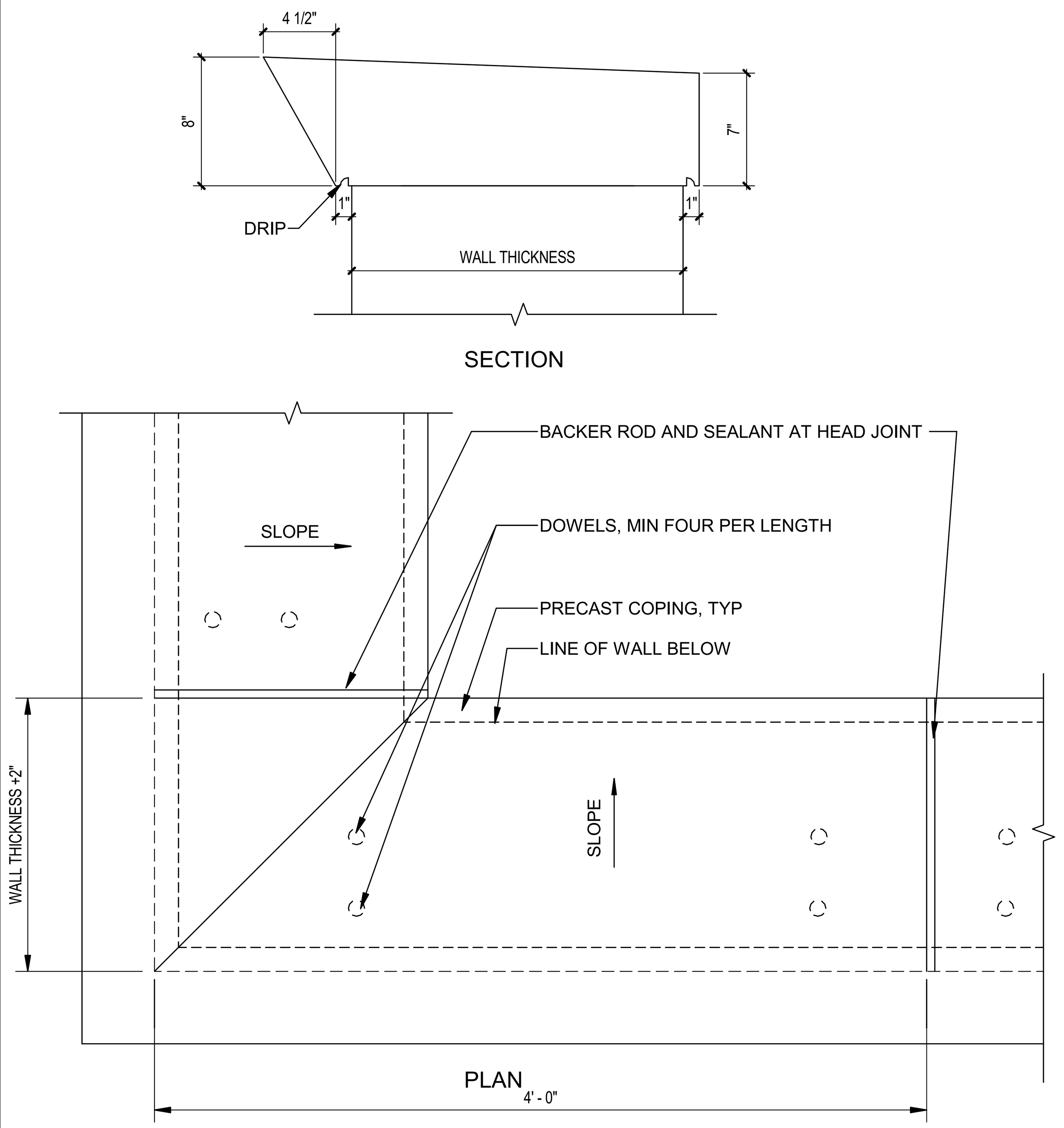
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-AD-04
WINDOW AND LOUVER DETAILS

Contract: 1800
CAD File Name:
Date: 5/16/2025
Sheet: 104 of 405

Plot Date: 8/13/2025 10:34:01 AM Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt



1 CAST STONE COPING
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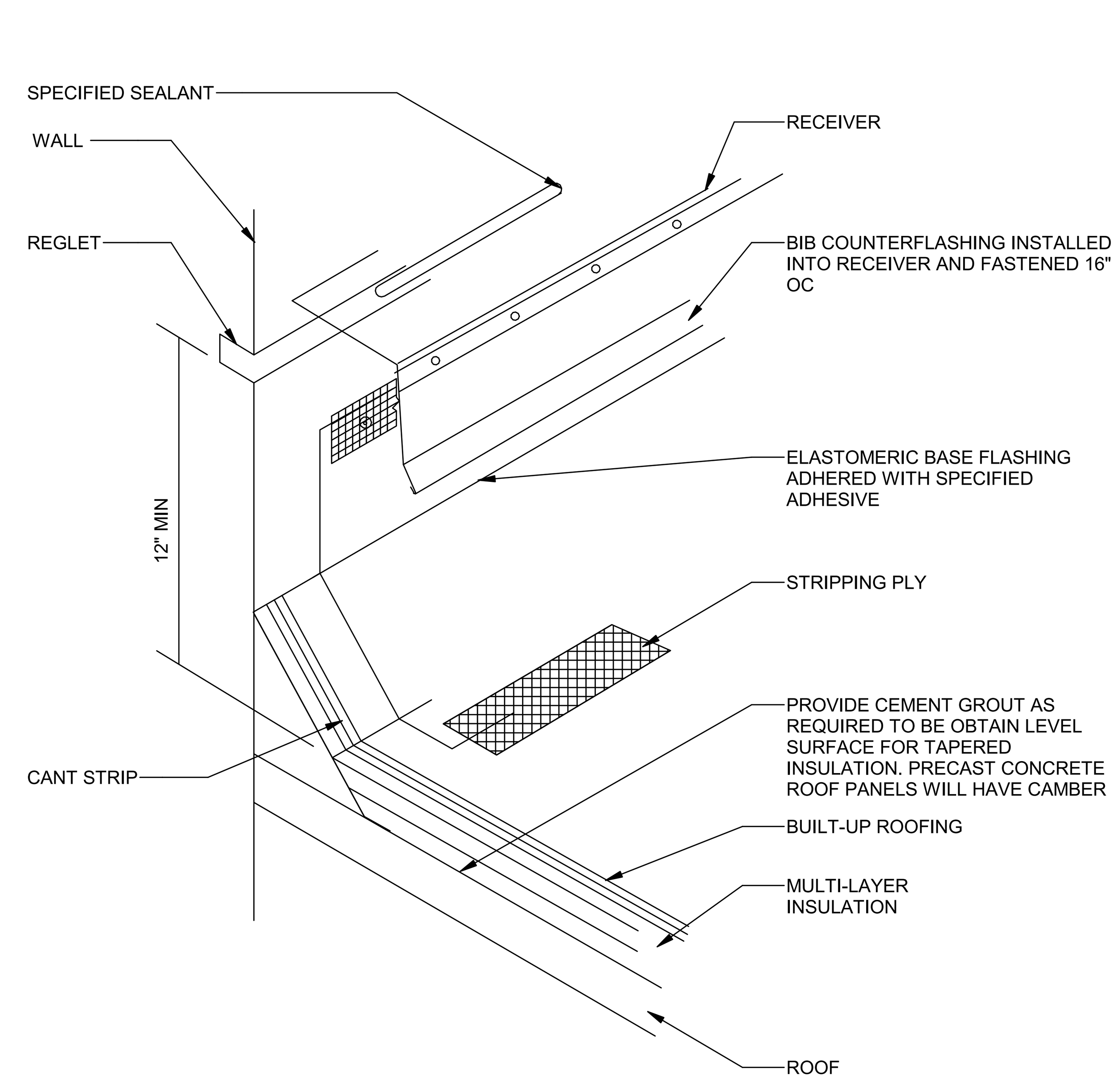
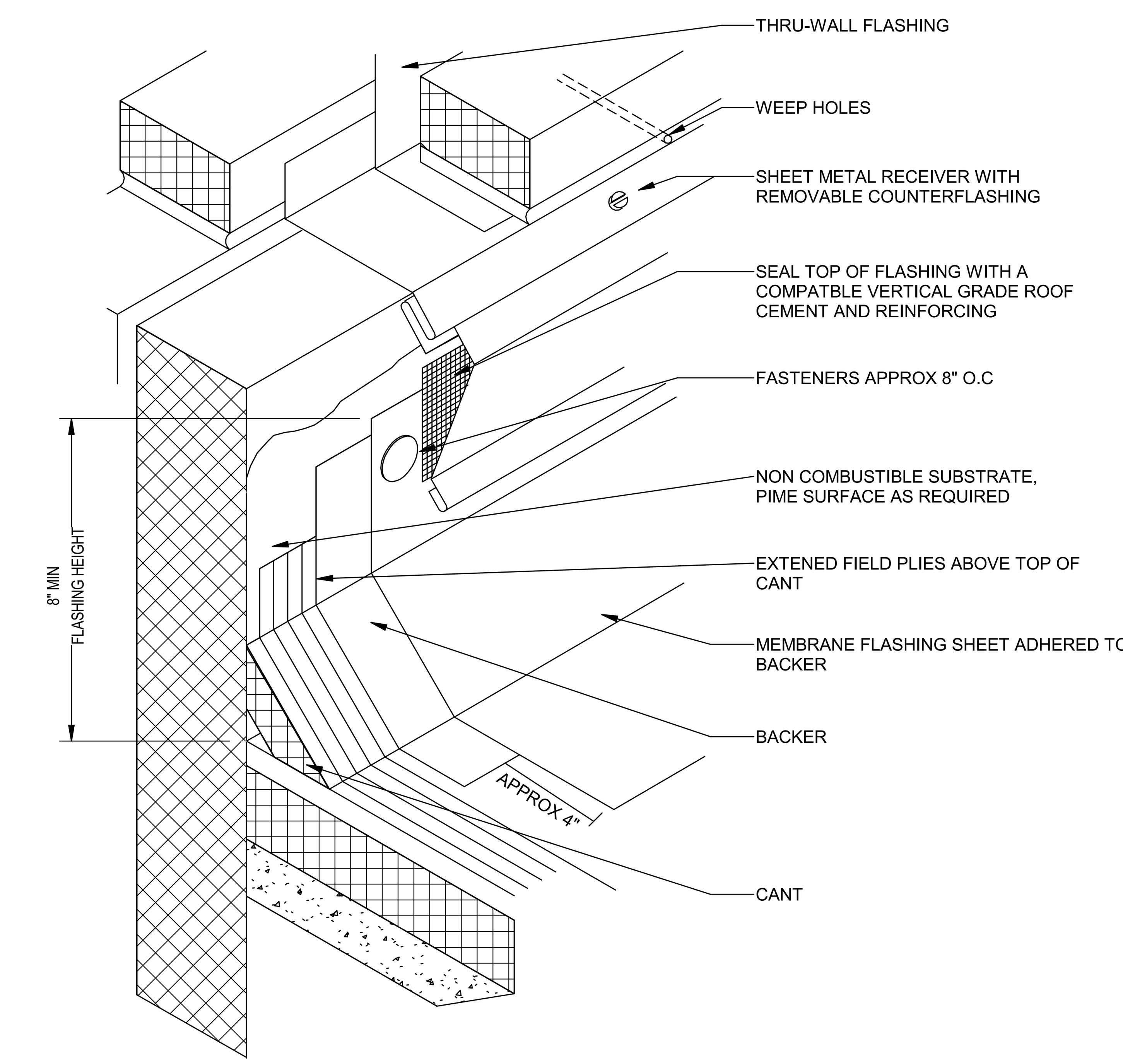
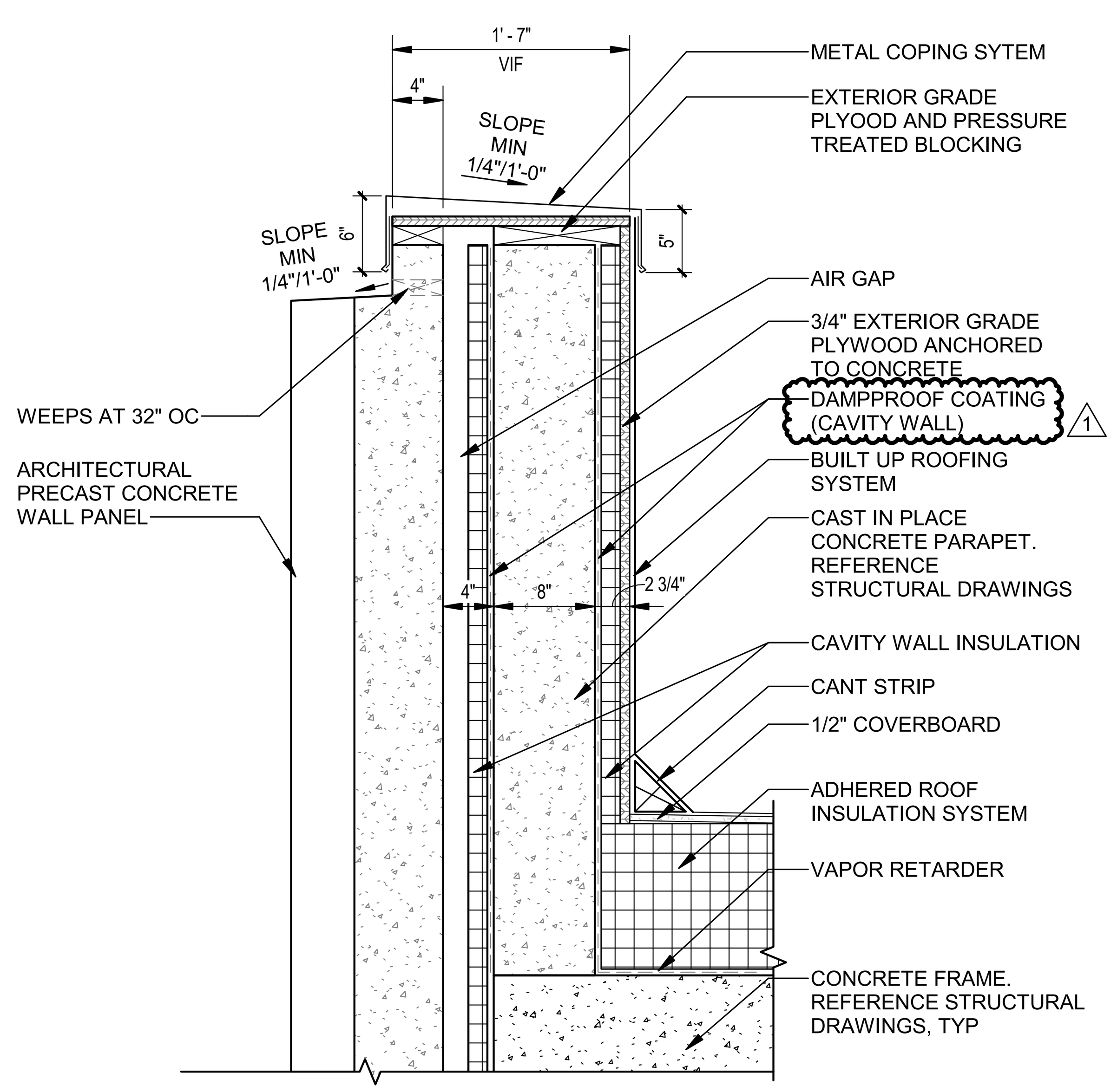


2 BUILT UP ROOF BASE FLASHING
NTS



3 BUILT UP ROOF BASE FLASHING AT MASONRY WALL
NTS



4 PARAPET DETAIL
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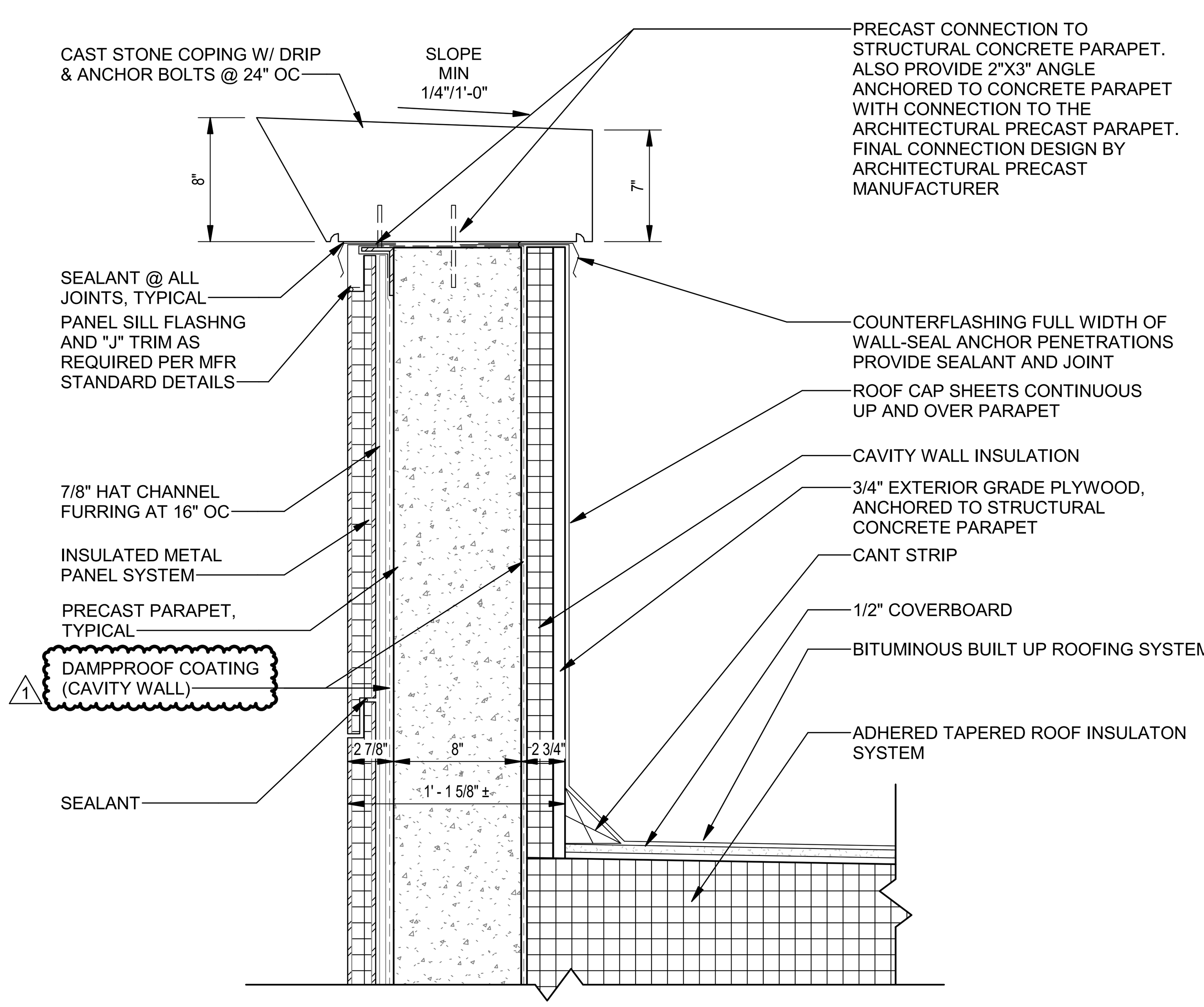
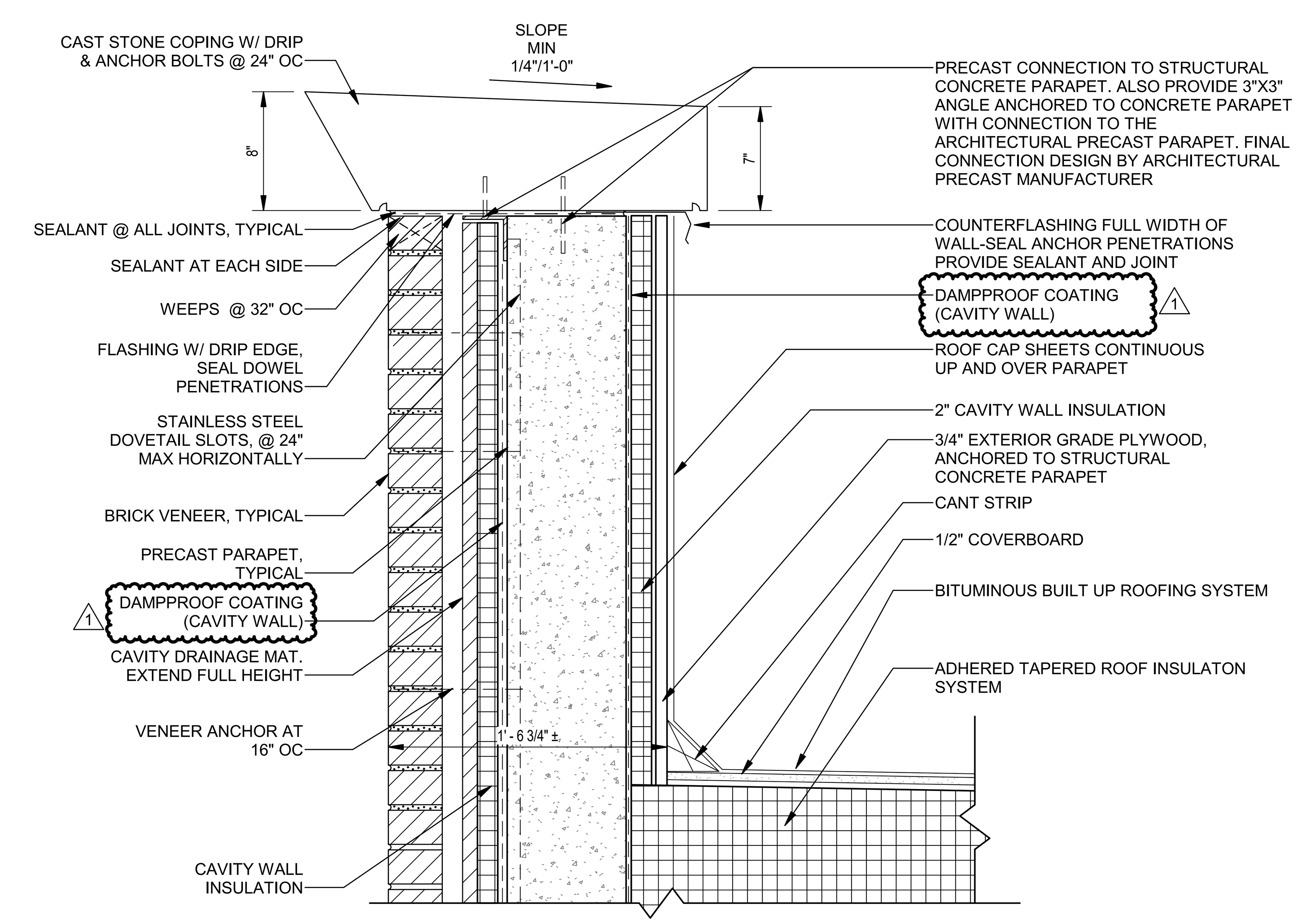


5 BUILT-UP ROOF PARAPET WITH CAST STONE COPING
NTS



6 BUILT-UP ROOF PARAPET WITH CAST STONE COPING
NTS

Plot Date: 8/13/2025 10:34:07 AM   Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt

Designed by:		REVISION			
B.GOMEZ	REV No.	DATE	DESCRIPTION	APPV
Drawn by:	0	5/16/25	ISSUE FOR BID	CKM
D.DIDASA	1	08/15/25	ADD. 9 - REVISED DAMPPROOFING AND VAPOR BARRIERS	CKM
Checked by:				
D.WALDROP				

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Signer Name: Christine Mondor
Signing Reason: I approved this document.
Signing Time: 2025-08-16 10:46:47(EDT)

REGISTERED ARCHITECT — PENNSYLVANIA — CHRISTINE MONDOR

alcosan — allegheny county sanitary authority

ARLETTA SCOTT WILLIAMS
EXECUTIVE DIRECTOR, ALCOSAN

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(412) 766 - 4810

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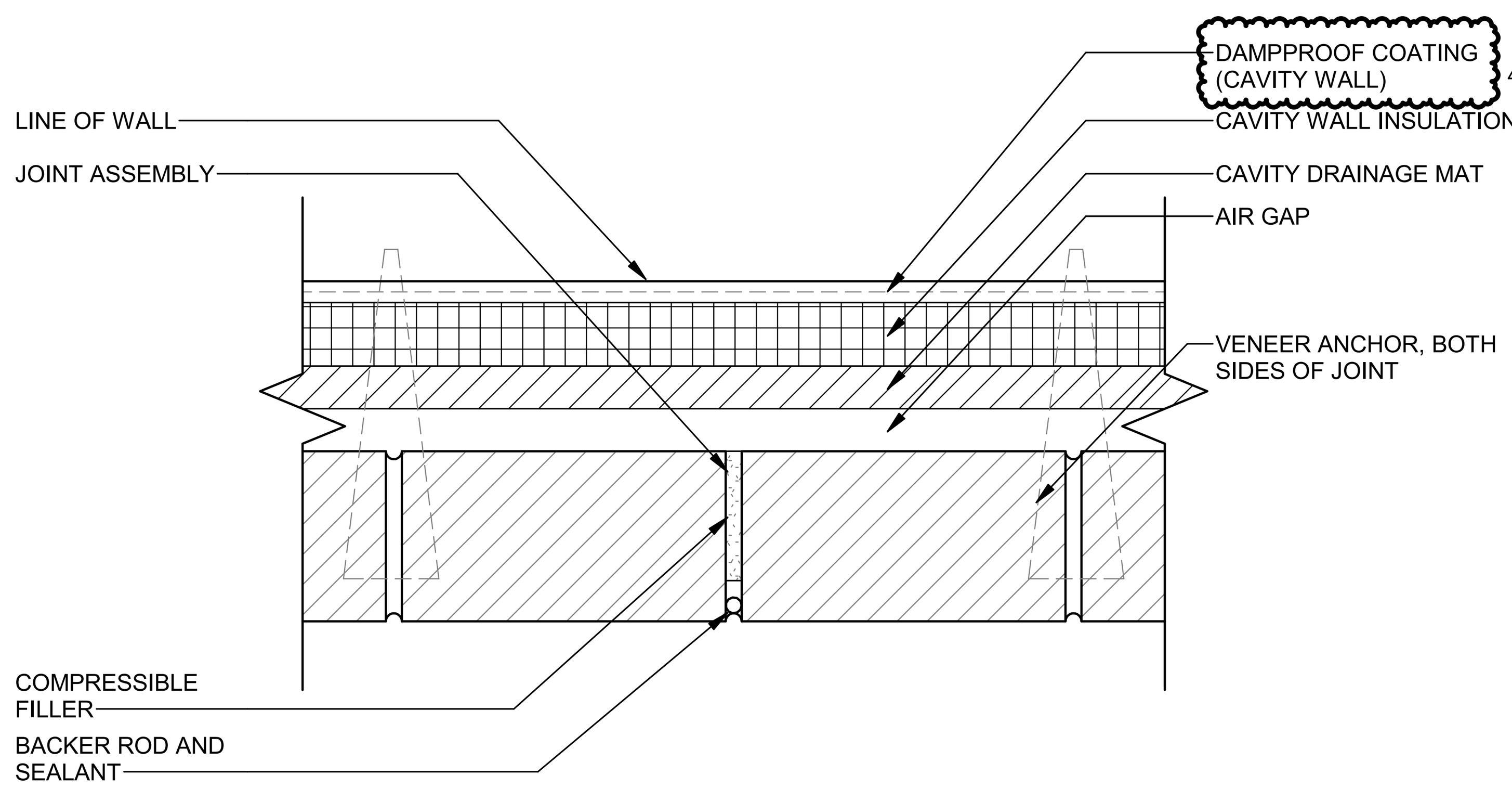
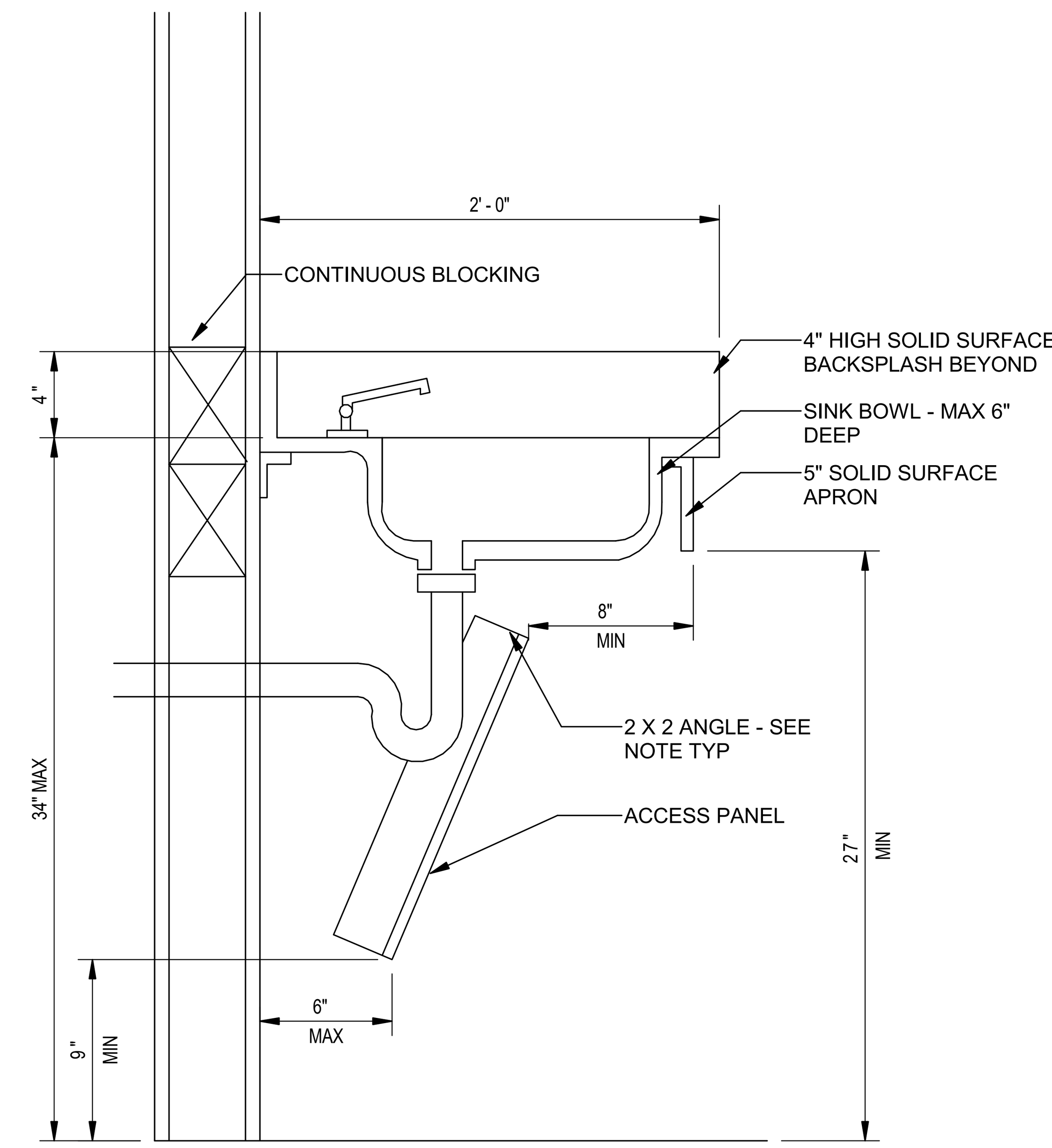
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-AD-06
ROOF DETAILS 2

Contract: 1800
CAD File Name:
Date: 5/16/2025
Sheet: 106 of 405

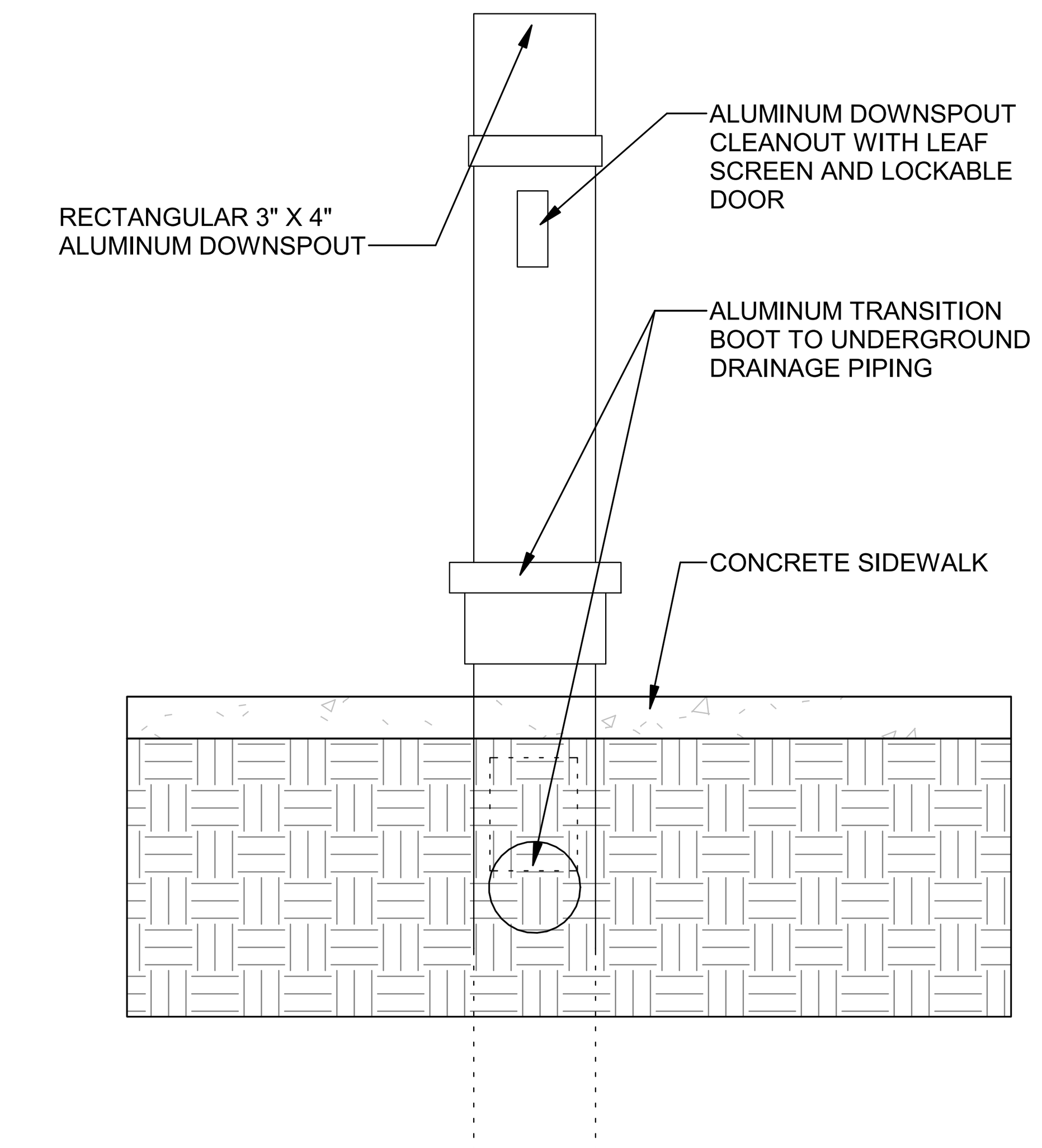


6 BRICK EXPANSION/CONTROL JOINT
NTS



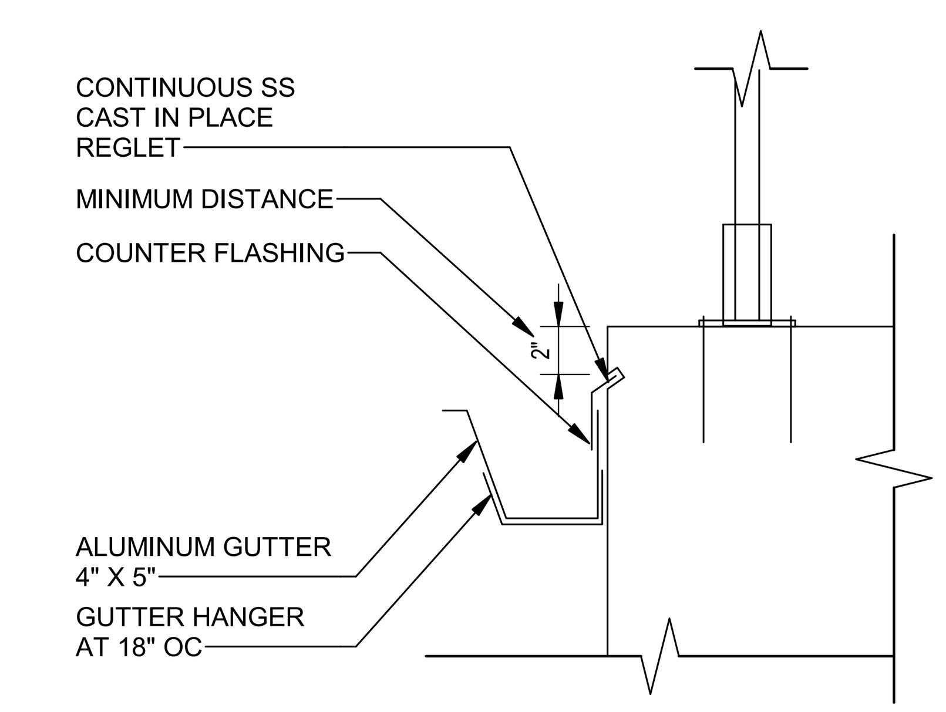
NOTE: PROVIDE 2" X 2" X 3/8" MIN SS ANGLE FRAME AND BRACKETS TO SUPPORT LAVATORY TOP AND ACCESS PANEL. PROVIDE END SUPPORT WHERE WALL DOES NOT OCCUR. DESIGNED BY CONTRACTOR

1 ADA SINK
NTS

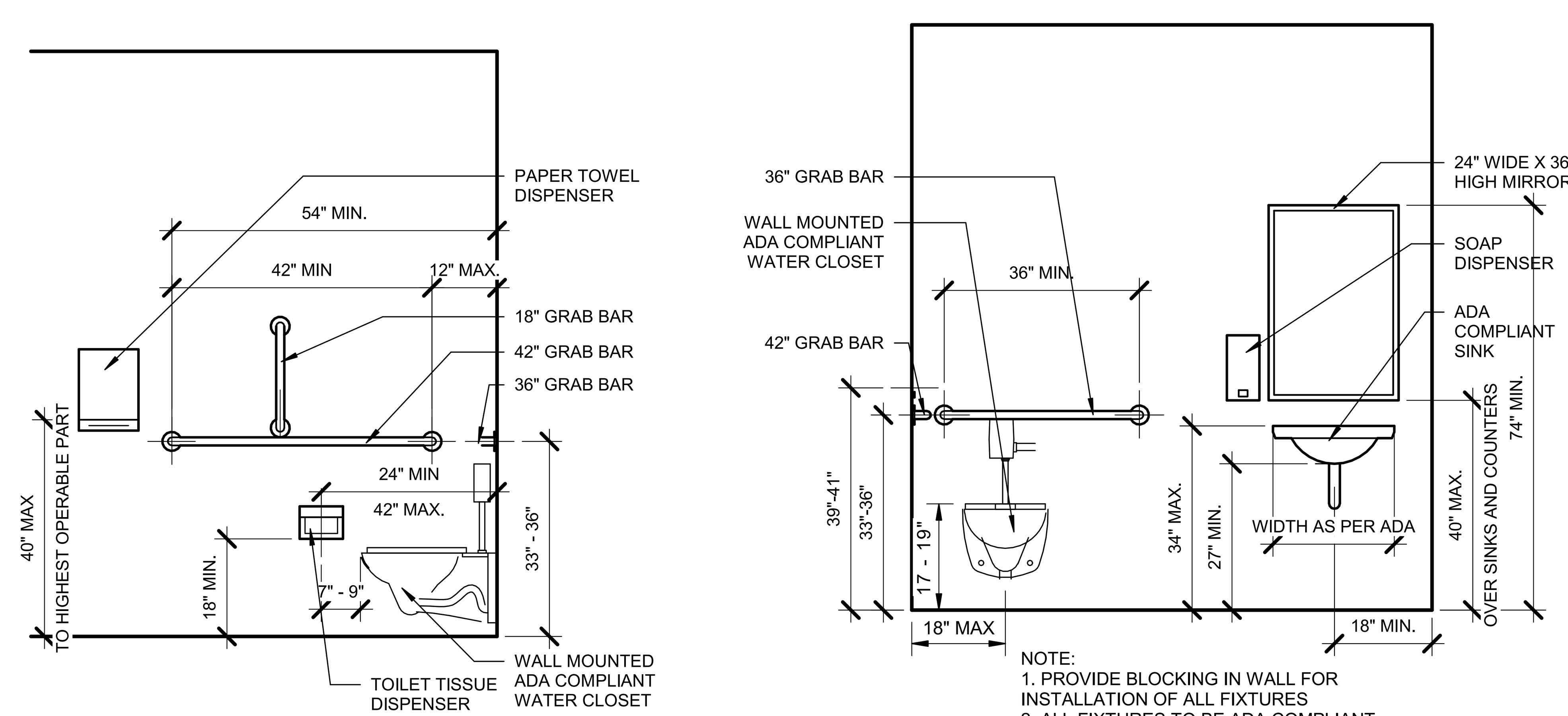


NOTE: PROVIDE PAINTED BRUSHED STAINLESS STEEL DOWNSPOUT BOOT, 30" HIGH, WITH DEBRIS EVACUATION CLEAN OUT BY PIEDMONT PIPE MANUFACTURING OR APPROVED EQUAL. COORDINATE TOP AND BOTTOM CONNECTION REQUIREMENTS WITH DOWNSPOUTS AND UNDERGROUND STORMWATER PIPING. COLOR TO MATCH DOWNSPOUT, TYPICAL.

3 CLEANOUT DETAIL
NTS



4 GUTTER FLASHING DETAIL
NTS



NOTE:
1. PROVIDE BLOCKING IN WALL FOR INSTALLATION OF ALL FIXTURES
2. ALL FIXTURES TO BE ADA COMPLIANT

2 ADA RESTROOM FIXTURE MOUNTING HEIGHTS
NTS

Christine Mondor
Signer Name: Christine Mondor
Signing Reason: I approved this document.
Signing Time: 2025-08-19 10:46:47(EDT)

Designed by:	REVISION			
B.GOMEZ	REV No.	DATE	DESCRIPTION	APPV
Drawn by:	0	5/16/25	ISSUE FOR BID	CKM
D.DIDASA	1	08/15/25	ADD. 9 - REVISED DAMPPROOFING AND VAPOR BARRIERS	CKM
Checked by:				
D.WALDROP				

Brown AND Caldwell

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REGISTERED ARCHITECT PENNSYLVANIA CHRISTINE MONDOR No. RA#015375
18 AUG 2025

alcosan allegheny county sanitary authority

ARLETTA SCOTT WILLIAMS
EXECUTIVE DIRECTOR, ALCOSAN

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(412) 766 - 4810

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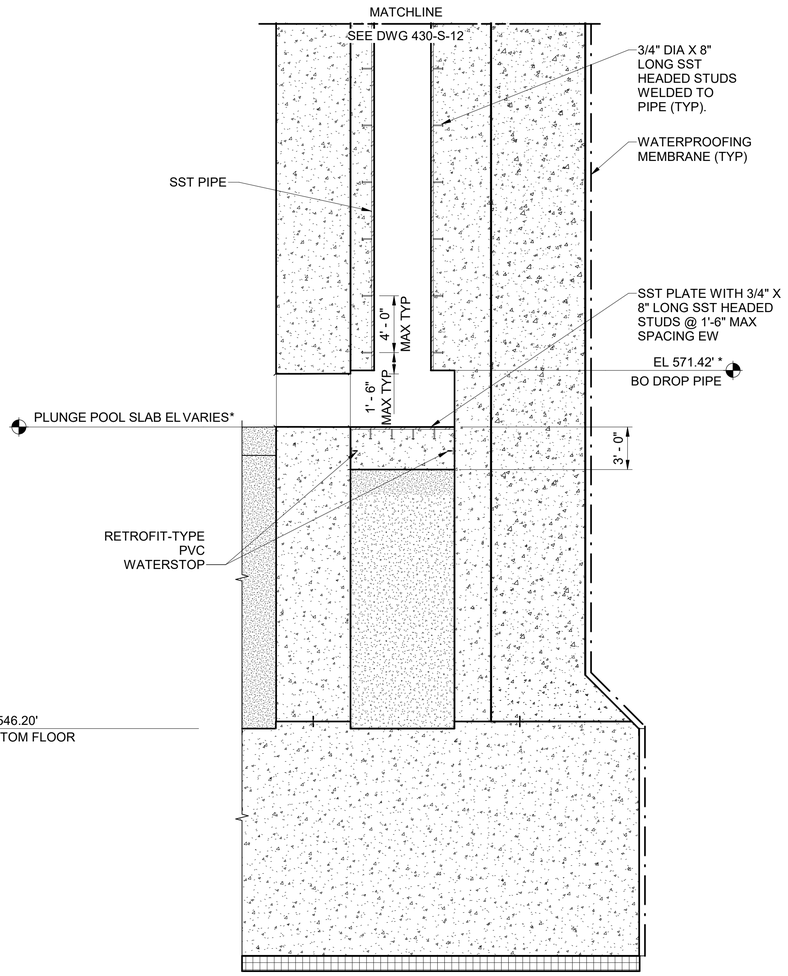
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

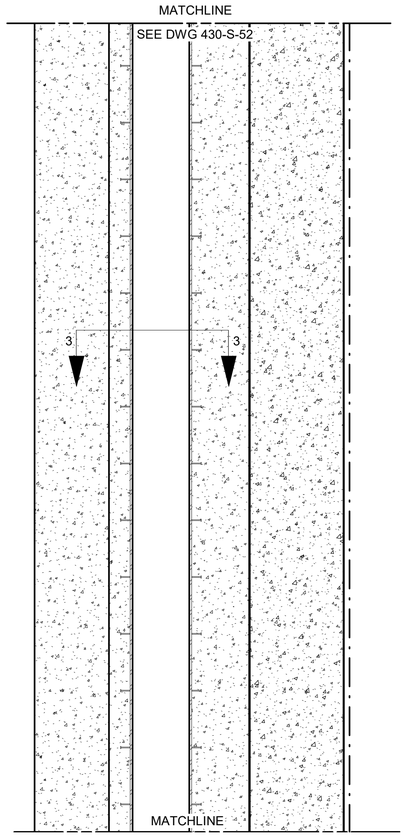
430-AD-10
MISCELLANEOUS DETAILS 1

Contract: 1800
CAD File Name:
Date: 5/16/2025
Sheet: 110 of 405

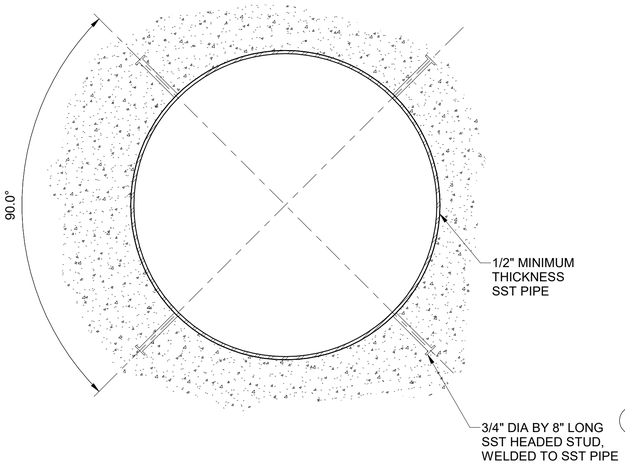
Plot Date: 8/13/2025 10:34:26 AM Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt



1 SECTION
430-S-01 SCALE: 3/16" = 1'-0"



2 SECTION
430-S-01 SCALE: 3/16" = 1'-0"



3 DROP PIPE SECTION
SCALE: 1" = 1'-0"

GENERAL NOTES:

1. FOR GENERAL NOTES, LEGEND, SYMBOLS & ABBREVATIONS SEE DRAWINGS 000-S-01 TO 000-S-003 AND 000-G-05.
2. INITIAL ROCK REINFORCEMENT AND SLURRY WALL NOT SHOWN FOR CLARITY.
3. ASTERISK INDICATES DIMENSIONS, ELEVATIONS, OR OTHER INFORMATION THAT SHALL BE COORDINATED BY THE CONTRACTOR WITH THE MANUFACTURER OF THE APPROVED EQUIPMENT. SEE MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
4. CONTRACTOR TO COORDINATE MAXIMUM LIFT HEIGHT WITH THE MANUFACTURER OF SST PIPE. ALL CALCULATIONS TO BE SUBMITTED TO THE OWNER FOR REVIEW AND APPROVAL.
5. ALL SST PIPE JOINTS TO BE PJP AND FINISHED FLUSH WITH INTERIOR SURFACE.
6. MINIMUM CLEARANCE BETWEEN SST STUDS AND SST PIPE JOINT OR CONCRETE CONSTRUCTION JOINT TO BE 1'-0".
7. ALL STAINLESS STEEL SHALL BE TYPE 316L.

1

0 1/2' 1' 2'
SCALE : 1" = 1'-0"

0 4' 8' 16'
SCALE : 3/16" = 1'-0"

Signer Name: Matthew Over
Signing Reason: I approved this document.
Signing Time: 2025-08-19 18:14:05(EDT)

Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-S-430V21.rvt
Plot Date: 8/15/2025 10:29:59 AM

Designed by:	REVISION			
M.OVER	REV No.	DATE	DESCRIPTION	APPV
Drawn by:	0	5/16/25	ISSUED FOR BID	JM
T.WIBLE	1	8/19/25	ADD. 9 - ADD GENERAL NOTE	JM
Checked by:				
R.CASTRO-KRAWIEC				

Brown AND Caldwell

J|C|K UNDERGROUND
A SCHNABEL ENGINEERING COMPANY

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL MATTHEW W. OVER ENGINEER PE094328 8/19/25

alcosan allegheny county sanitary authority

ARLETTA SCOTT WILLIAMS
EXECUTIVE DIRECTOR, ALCOSAN

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ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-S-12
DROP PIPE AND PLUNGE POOL SECTION

Contract:	1800
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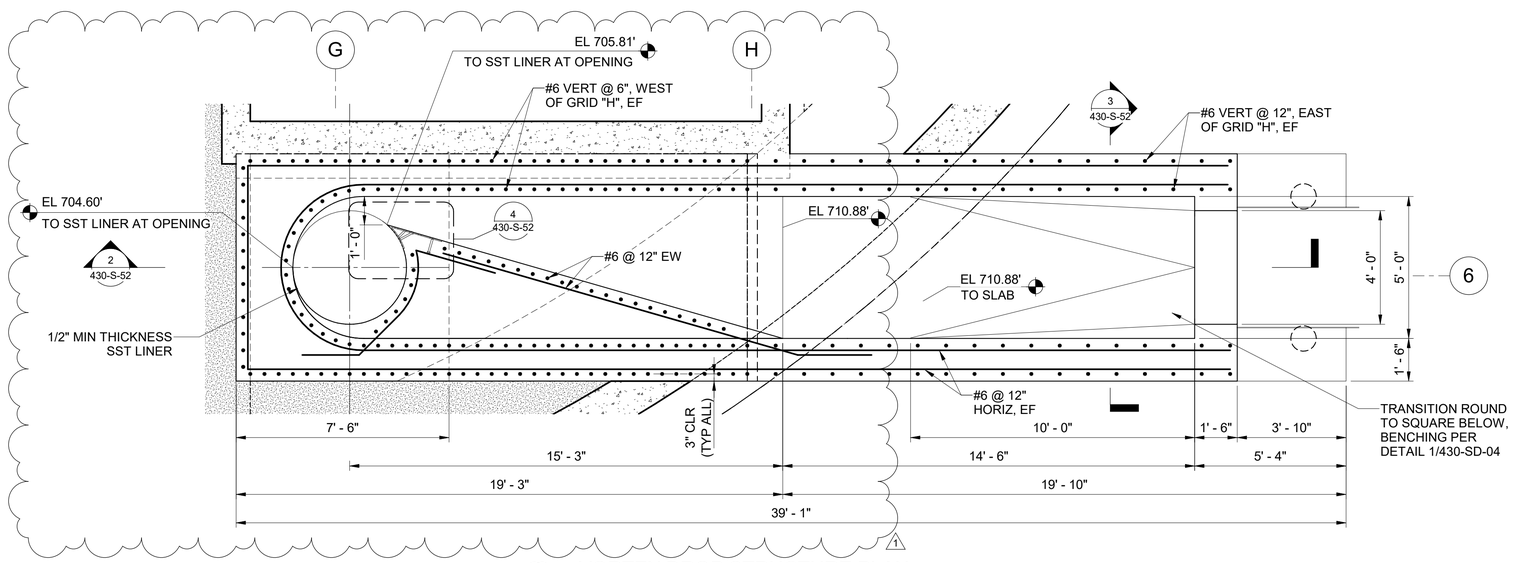
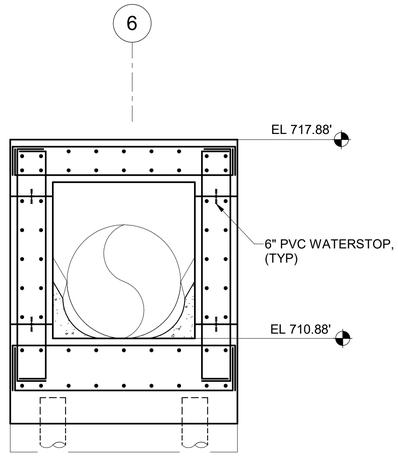


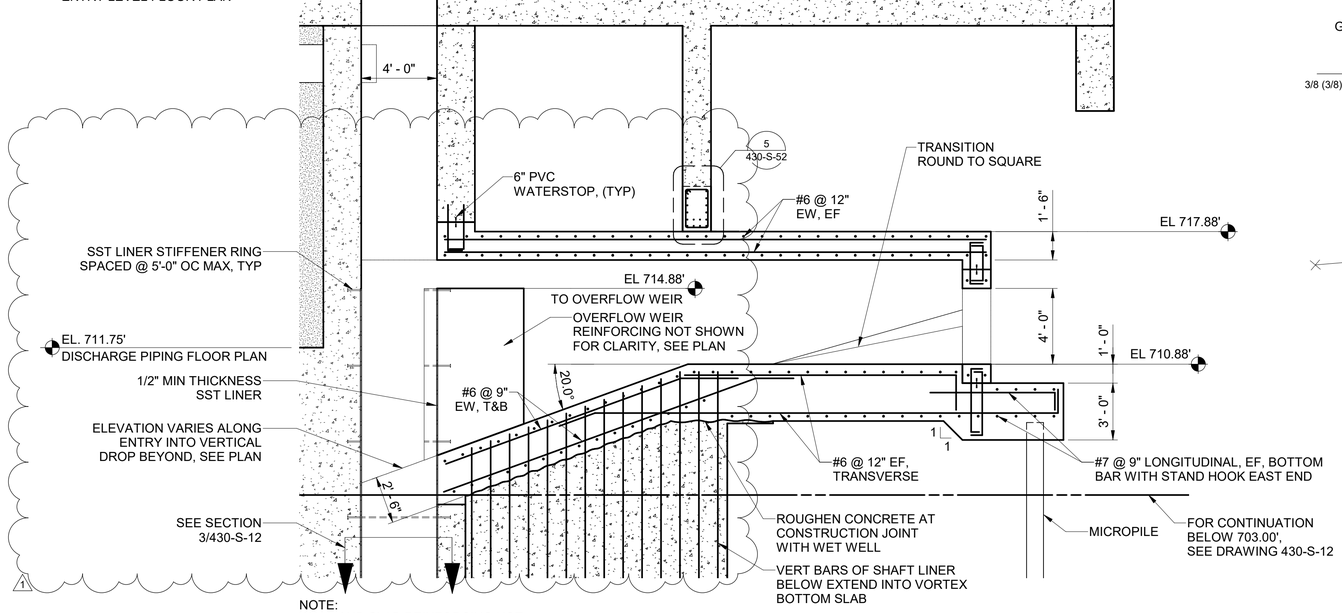
1 430-S-51 VORTEX DROP STRUCTURE PLAN
SCALE: 3/8" = 1'-0"



3 430-S-52 SECTION
SCALE: 3/8" = 1'-0"

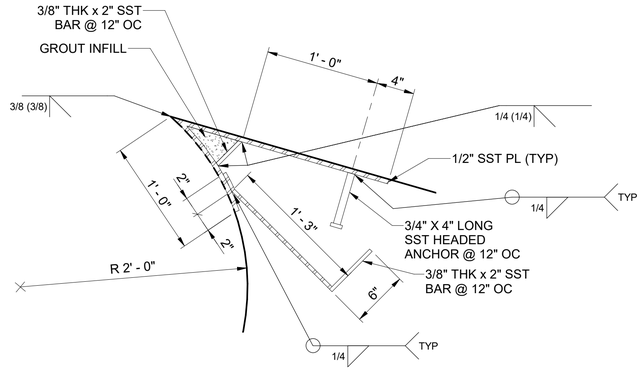
GENERAL NOTES:

1. FOR STANDARD STRUCTURAL DETAILS, SEE DRAWINGS 430-SD-01 TO 430-SD-12.
2. REINFORCING STEEL IS SHOWN INDICATIVELY AND SHALL NOT BE SCALED FROM THE DRAWINGS. REINFORCING SIZE, SPACING, QUANTITY, EXTENTS, AND LENGTH SHALL BE BASED ON THE ANNOTATIONS ON THE DRAWINGS.
3. ALL STAINLESS STEEL SHALL BE TYPE 316L.
4. ALL SST LINER/SST PIPE JOINTS TO BE PJP AND FINISHED FLUSH WITH INTERIOR SURFACE.

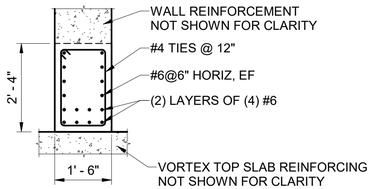


NOTE:
WALL AND SLAB REINFORCING NOT ASSOCIATED WITH THE VORTEX STRUCTURE NOT SHOWN FOR CLARITY.

2 430-S-52 SECTION
SCALE: 1/4" = 1'-0"



4 430-S-52 VORTEX STRUCTURE NOSING DETAIL
SCALE: 1 1/2" = 1'-0"



5 430-S-52 BEAM DETAIL
SCALE: 1/2" = 1'-0"

0 1/2" 1" 2"
SCALE : 1" = 1'-0"

0 2" 4" 8"
SCALE : 1/4" = 1'-0"

0 2" 4" 6"
SCALE : 3/8" = 1'-0"

0 1" 2"
SCALE : 1 1/2" = 1'-0"

Plot Date: 8/15/2025 10:30:00 AM Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-S-430V21.rvt

Designed by:	REVISION			
A.KEARNS	REV No.	DATE	DESCRIPTION	APPV
Drawn by:	0	5/16/25	ISSUED FOR BID	JM
T.WIBLE	1	8/19/25	ADD. 9 - ADD SST LINER/LOWER WEIR/REVISE SECTION 2	JM
Checked by:				
J.MINADEO				

Brown AND Caldwell

Signer Name: Justin Minadeo
Signing Reason: I approved this document.
Signing Time: 2025-08-19 10:18:14(EDT)

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL JUSTIN C MINADEO ENGINEER PE082048

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ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-S-52
VORTEX DROP STRUCTURE PLAN AND SECTIONS

Contract:	1800
CAD File Name:	
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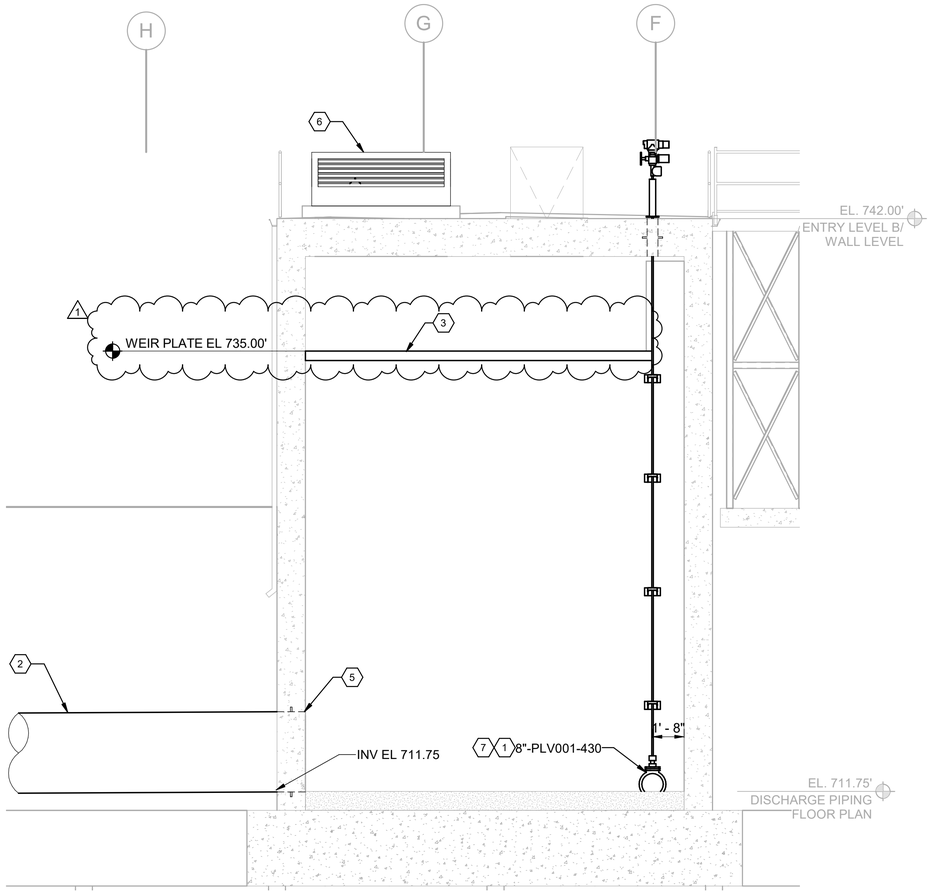
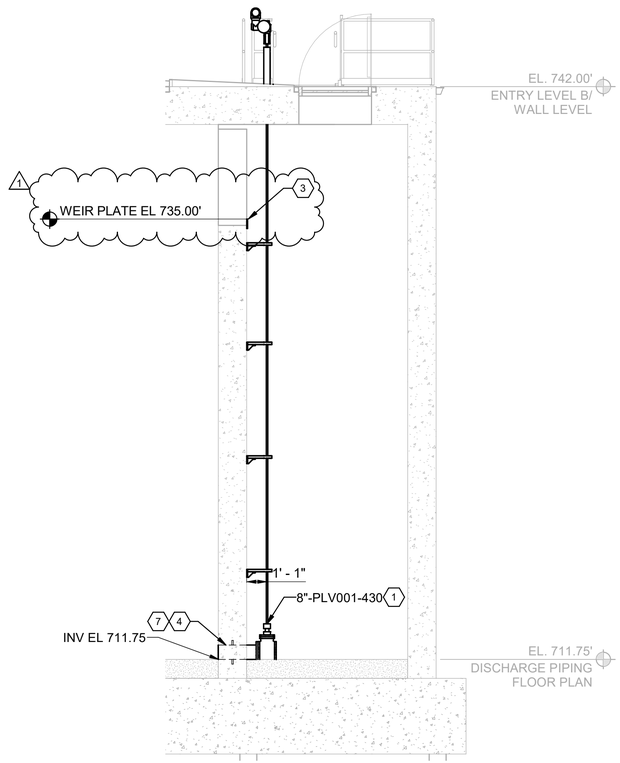
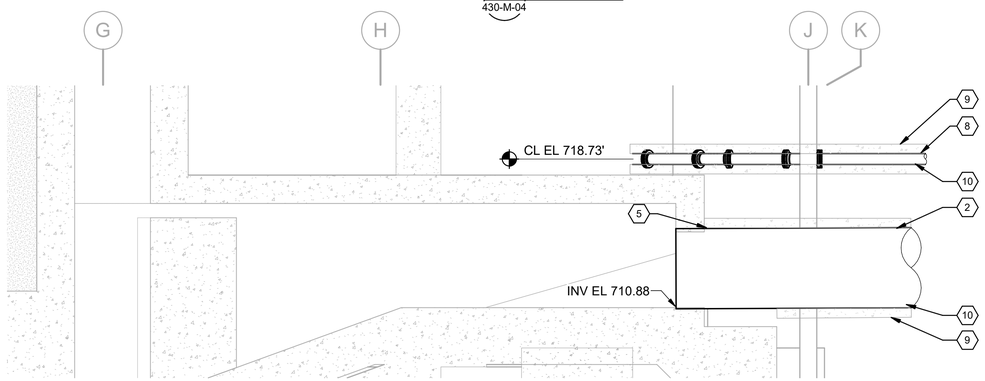


1 SECTION
430-M-04



2 SECTION
430-M-04



3 SECTION
430-M-05

KEYNOTES:

1. ECCENTRIC PLUG VALVE WITH EXTENSION STEM AND ELECTRIC MOTOR ACTUATOR, TYP.
2. DIP-48"-RSW-RPO.
3. OVERFLOW WEIR PLATE. WEIR PLATE SHALL SPAN ENTIRE LENGTH OF HORIZONTAL WEIR WALL. SEE DETAIL S33002/430-SD-02. FOR ADDITIONAL DETAIL.
4. TYPE F PIPE PENETRATION. SEE DETAIL 3/430-MD-03.
5. TYPE K PIPE PENETRATION, SEE DETAIL 13002/430-MD-03.
6. PENTHOUSE. SEE DETAIL 18/ 430-MD-10.
7. SEE STRUCTURAL DRAWINGS FOR CONCRETE BLOCKOUT AROUND PLUG VALVE. EPOXY GROUT UNDERNEATH VALVE TO BASE OF VALVE.
8. DIP-6"-EWH-FE.
9. PIPE ENCASEMENT. SEE DETAILS ON 430-SD-07.
10. SEE DETAIL W/000-CD-05 FOR PIPE CONNECTION TO STRUCTURE.

0 2' 4' 8'
SCALE : 1/4" = 1'-0"

Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-M-430V21.rvt

Plot Date: 8/14/2025 11:33:10 AM

Designed by:	REVISION			
A.JUERGENS	REV No.	DATE	DESCRIPTION	APPV
Drawn by:	0	5/16/25	ISSUED FOR BID	AJ
R.PAVLISICH	1	8/19/25	ADD. NO. 9 - WEIR PLATE	AJ
Checked by:				
C.MICHALOS				

Brown AND Caldwell

Signer Name: Andrew Juergens
Signing Reason: I approved this document.
Signing Time: 2025-08-19 10:20:13(EDT)

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ANDREW D. JUERGENS
ENGINEER
PE096611

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ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-M-20
SECTIONS 8

Contract: 1800
CAD File Name:
Date: 5/16/2025
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