JULY 30, 2025

CONTRACT NO. 1800

WET WEATHER PUMP STATION

ADDENDUM NO. 6

All bidders bidding **Contract No. 1800** shall read and take note of this **Addendum No. 6.** 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. 6

The Acknowledgement attached to **Addendum No. 6** is to be signed and returned immediately via email at contract.clerks@alcosan.org and acknowledged with Bidder's Proposal.

~~**Kimberly Kennedy, P.E.**~~ Jeff Argyros, P.E. (on behalf of Kimberly Kennedy)
Director – Engineering and Construction

ACKNOWLEDGEMENT OF

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

ADDENDUM NUMBER 6

FIRM NAME: _____

SIGNATURE: _____

TITLE: _____

DATE: _____

July 30, 2025

CONTRACT NO. 1800

WET WEATHER PUMP STATION

ADDENDUM NO. 6

ADDENDUM NO. 6

ALLEGHENY COUNTY SANITARY

AUTHORITY

PITTSBURGH, PENNSYLVANIA

CONTRACT NO. 1800

WET WEATHER PUMP STATION PROJECT

July 18, 2025

ATTENTION

NEW BID OPENING DATE

WEDNESDAY, SEPTEMBER 17, 2025

11:00 A.M.

NEW DEADLINE FOR QUESTIONS IS FRIDAY, AUGUST 15, 2025

This Addendum No. 6 consists of 28 pages and the following attachments:

Attachment A – Addendum No. 6 Specifications (49 pages)
Attachment B – Revised Geotechnical Baseline Report (38 pages)
Attachment C – Drawings – 22”x34” (7 pages)
Attachment D – Addendum No. 6 Volume 1 of 1 Reference Information – Revised Table of Contents, Addition to Section 5I Switchgear Summary and New Section 5L Sample Loop Drawings (10 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 Improvements 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. 6 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 THE LEGAL NOTICE, INFORMATION FOR BIDDERS AND GENERAL CONTRACT CONDITIONS

1.1 In Volume 1 of 5, Legal Notice, in the first paragraph **CHANGE** the words "Tuesday, August 19, 2025" to read "Wednesday, September 17, 2025.

1.2 In Volume 1 of 5, Article 2.06, in the second paragraph **CHANGE** the words "Tuesday, August 19, 2025" to read "Wednesday, September 17, 2025.

1.3 In Volume 1 of 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, Friday, August 15, 2025."

1.4 In Volume 1 of 5, Article 3.32.E.9, **CHANGE** "Paragraph 3.55" to "Paragraph 3.56".

2. CHANGES TO THE SPECIFICATIONS

2.1 In Volume 2 of 5, Section 01 22 00 Measurement and Payment, **REPLACE** Section in its entirety. Refer to Attachment A of Addendum No. 6.

2.2 In Volume 3 of 5, Section 31 11 00 Clearing and Grubbing, Part 1.06.A, **REPLACE** the text with the following:

"A. Certifications: For all material removed from the site, Contractor shall forward appropriate documentation of the disposition of the materials, including, but not limited to, as applicable, bills of lading, manifests, certifications, and permitting, within two days of sending each shipment of

designated material offsite."

2.3 In Volume 3 of 5, Section 31 63 33 Drilled Micropiles, Part 3.03.A.3.b, **DELETE** the following sentence,

"Divide the total number of micropiles into lots and utilize a random selection method to select one proof test pile from each lot."

2.4 In Volume 2 of 5, Section 03 30 00 Cast-In-Place Concrete, Paragraph 2.02, Table 03 30 00-4 footnote 4. **ADD** the following text at the end of footnote 4.

"Slump range does not apply to slurry wall; Contractor shall establish the permissible range of slump for proper installation of the slurry wall."

2.5 In Volume 3 of 5, Section 31 62 16 Temporary Support of Excavation Systems, Paragraph 3.01.A.13, **REVISE** the paragraph to the following:

"13. Before removal of any Engineer-designed support of excavation, receive Owner approval."

2.6 In Volume 3 of 5, Section 41 22 13.13 Radial Bridge Cranes and Hoists, **REPLACE** Section in its entirety. Refer to Attachment A of Addendum No. 6.

2.7 In Volume 3 of 5, Section 40 61 13 Process Control Systems General Requirements, **REPLACE** Part .1.05.A.5 with the following text:

" 5. Each Contractor that is providing wiring for the project, shall develop and furnish Loop Diagram to the Owner. The Loop Diagrams shall be assembled per Owner Loop Standards, which will be supplied to the respective Contractor."

2.8 In Volume 3 of 5, Section 40 61 13 Process Control Systems General Requirements, **REPLACE** Part .1.05.A.7 with the following text:

7. Loop diagrams as specified in this Section. Loop diagram content shall include but not be limited to the following for reference. Refer to sample loop diagrams for additional information.

a. Loop diagram sections and details, including ALCOSAN area designations and floor level shall be provided. At a minimum. include equipment name, new/existing designation, equipment tag, terminal block, terminal number, wire tag, wire number, conduit tag, conduit wire fill and type, fiber optic connection blocks, points/terminals, cable tags, strand tags, conduit tags, pull box tags, patch panels tags/blocks/points/terminals for entire fiber circuit, circuit breaker and size, instruments, sensors, all wired equipment and devices, motors, disconnects, circuit breakers, control devices, VFDs, MCCs, starters, other control equipment, control panels and individual components, vendor supplied panels devices and components, vendor cable tags, vendor cable wire tags, external components, pull boxes and

terminals, termination panels, electrical gear and components, DCS/DPU front designation with drop, card, point, point type, tag, terminal wiring color/tag, and control function description, DCS/DPU front designation with dop, card point, point type, tag, terminal wiring color/tag, and control function description. Every terminal/patch block, terminal/patch point, cable tag, wire/strand tag, wire/strand color, conduit tag, conduit wire fill and type, patch panel, intermediate panel, device and end device shall be detailed. Include at a minimum, the following loop diagram sections.

1) Field Process Area
2) Local Control Panels
3) Field Process Area (1)
4) Control Panel
5) Field Process Area (2)
6) DCS/DPU Front
7) DCS/DPU Rear
8) Additional Sections as required"

2.9 In Volume 3 of 5, Section 31 71 16 Blasting, Vibration and Noise Control, **REPLACE** Section in its entirety. Refer to Attachment A of Addendum No. 6.

3. CHANGES TO THE GEOTECHNICAL BASELINE REPORT

3.1 **REPLACE** Volume 4 of 5 Geotechnical Baseline Report in its entirety. Refer to Attachment B of Addendum No. 6.

4. CHANGES TO THE DRAWINGS

4.1 **REPLACE** Sheets 430-S-47 and 430-S-48 with Sheet 430-S-47 Rev. 01 and 430-S-48 Rev. 01, refer to Attachment C.

4.2 **REPLACE** Sheets 430-A-09, 430-A20, 430-A-28, 430-AS-01, and 430-AD-09 with Sheets 430-A-09 Rev. 01, 430-A20 Rev. 01, 430-A-28 Rev. 01, 430-AS-01 Rev. 01, and 430-AD-09 Rev. 01, refer to Attachment C.

5. CHANGES TO VOLUME 1 of 1 REFERENCE INFORMATION

5.1 **REPLACE** the Table of Contents with the revised Table of Contents contained in Attachment D.

5.2 At the end of Section 5I ALCOSAN WWPS EXISTING SWITCHGEAR LOCATION SUMMARY, **ADD** new pages Contract 1070D, contained in Attachment D.

5.3 At the end of Section 5 Reference Drawings, **ADD** new Section 5L SAMPLE LOOP DRAWINGS. contained in Attachment D.

6. QUESTIONS AND ANSWERS

Q1: Specification 01 22 00 -Pay Item 18 – Specific Allowance #7 - Excavation of "Hard Slag" Removal states "...bid price and payment will include all costs for furnishing all labor, materials, and equipment required for excavation, handling, removal and disposal of hard slag found during installation of piping, structures, or temporary earth retaining structures that cannot be removed utilizing conventional excavation equipment and methods.
Question - If "hard slag" is encountered below the top ten of excavation in any slurry diaphragm panel excavation and it cannot be removed with a "clamshell", will the time taken to remove the "hard slag" be paid for under this Item?

A1: If hard slag is encountered below the top ten feet of excavation in slurry wall panel excavations it will be paid under Pay Item 13 - Specific Allowance #2 - Stoppage to Slurry Wall Trench Excavation. Refer to Item 2.1 of Addendum No. 6 for deletion of the term "clamshell" from Pay Item 18 and additional revisions.

Q2: Specification 0122 00 Pay Item 19 – Specific Allowance #8 – Excavation and Demolition Of Unforeseen Concrete, Masonry and Other Manmade Obstructions states "Payment for this pay item will be made as an allowance, per Article 1.4 above, which total bid price is set and provided in the Contract Documents. Payment will include all costs for furnishing all labor, materials, and equipment required for excavation, demolition, handling, and disposal of manmade obstructions found during installation of piping, structures, or temporary earth retaining structures.".
Question - If "unforeseen concrete, masonry or other manmade obstructions are encountered below the top ten of excavation in any slurry diaphragm panel excavation and they cannot be removed with a "clamshell", will the time taken to remove the "unforeseen obstruction be paid for under this Item?

A2: Refer to Item 2.1 of Addendum No. 6 for deletion of the term "clamshell" from Pay Item 19 and additional revisions.

Q3: Specification Section 31 75 00 1.07 (A) states: "It shall be the responsibility of the Contractor in all instances to carry adequately and safely any and all loads that may be applied to the lining. The Contractor shall design any modifications to the shaft initial support and final lining to carry all loads generated by its choice of construction technique at no additional cost to the Owner." What construction techniques and loadings have been assumed as a baseline in the Owner provided design?

A3: The slurry wall design considers a maximum surcharge at grade of 600 psf acting on the exterior of the shaft. The slurry wall is also designed vertically to allow for demolition of panels subject to the limitations stated on the Contract Drawings.

The permanent shaft liner is designed for an interim condition where only the base slab and shaft external liner are installed.

All other temporary conditions and temporary loadings outside of these permissible configurations are the responsibility of the Contractor.

Q4: Specification Section 31 62 16 3.01 (A) 13 states: "Before removal of any support of excavation, receive Owner approval." Please clarify what submittals, acceptance criteria the Owner's approval will be based on, and confirm Owner review period.

A4: Refer to Item 2.5 in Addendum No. 6. The submittal requirement for removal of Engineer-designed SOE is also clarified under Section 1.04 of the specification. The required submittal is to identify the portion of the Engineer-Designed SOE to be removed. The review time for this type of submittal will follow the Contract procedures for Owner review time.

Q5: Specification Section 31 11 00 3.01 (B) states: "Protect existing site improvements that are to remain from damage during construction. Restore damaged improvements to their original condition, as acceptable to Owner." Can the owner please identify the specific "site improvements" which are to remain in the construction area.

A5: **S**ite improvements not identified for demolition in the contract drawings shall be protected from damage.

Q6: Reference drawing 430-AD-09 Fire Stopping Details 2 : Detail 4 references firestopping between 8" CMU and concrete roof slab but does not specify if it also applies between 8" CMU and the concrete deck in the electrical room or other floor slabs. Please confirm if this firestopping system also applies between 8" CMU and the concrete deck in the electrical room or other floor slabs for this project.

A6: This fire stopping detail applies at the rated walls of the electrical room and all other

locations where a rated wall intersects a concrete deck or floor slab.

Q7: Reference drawing 430-AD-09 detail 3 : We cannot find a reference in the plans to this detail. Where does this condition occur ?

A7: This detail is not used. Refer to Item 4.2 of Addendum No. 6. .

Q8: Prior to starting any substantial work at the site, a new utility infrastructure will need to be installed and the existing utilities will need to be decommissioned and removed to eliminate conflicts with the WWPS work. The four General Contractors on the project share the number of calendar days in which to complete the project with no interim milestones for the completion of these relocations. Because the General Contractor will be at the mercy of utility relocations installed by the Electrical, HVAC & Plumbing General Contractors, please add an interim contract milestone to specify the number of calendar days to be allotted to the initial utility relocations and subsequent existing utility decommissioning.

A8: Contract Documents stand as written.

Q9: Please clarify the scopes of the Multi Prime Contractors for the project, specifically the interface between the General and Electrical Prime Contractors. Due to the Pennsylvania Separations Act, the General Contractor cannot install any work that would be claimed by the Electricians, temporary or permanent. Please clarify the Contract Documents to reflect this restriction and clearly delineate between the General and Electrical Prime Contractors with regards to temporary power materials, installation, operation and demolition.

A9: Alcosan is in compliance with the Pennsylvania Separations Act by bidding this project with a Multi-Prime project delivery system. Refer to Section 01 11 00 Summary of Work Part 1.02.B.32, 1.02.C.32, 1.02D.12 and 1.02.E.15.

Q10:. Specification Section 01 50 00, paragraph 1.11.A.1 tells the bidders what temporary electricity is available for the project. Which of the four prime contractors will take precedence in the use of this provided power?

A10: The temporary power sources shall be shared. Refer to Section 01 31 15 Summary of Multiple Contracts, Part 1.05 Coordination and 01 52 00 Maintenance of Plant Operations, Part 1.01.C that HVAC and plumbing work are generally expected to occur later in the project.

Q11: Specification Section 01 50 00, paragraph 1.11.A.1 tells the bidders the

details on temporary electricity available for the project. Please confirm the power figures listed as they are not sufficient for a project of this magnitude.

A11: The power sources listed are all that are available for the project. Any additional temporary power that is required shall be provided under the respective contract that requires the power. Refer to Section 01 11 00 Summary of Work, Parts 1.02.B.31 and B.32, 1.02.C.31 and C.32. 1.02.D.12 and 1.02.E.15.

Q12: Specification 07 10 50, 1.05 Quality Assurance, B. Field samples and testing, 2. "single weld samples, three-foot long, from each welding machine and welder, prior to start of shift are required." this requirement is typical when using an automatic welding machine. Is it the engineer's intent to require 3' samples at the beginning of each shift when seam welding is performed by hand with a heat gun?

A12: Yes.

Q13: Specification 31 56 00, Section 1.03.A.5 - The definition for a Primary Panel states " excavated through soil…". Since the Slurry wall toes is at El. 654 which is 23 +/- feet into bedrock, does the word "soil" in the definition include rock?

A13: Correct. The slurry wall panel shall be excavated through soil and rock as shown on the Plans.

Q14: Specification 31 56 00, Section 1.03.A.9 - The definition for Slurry Wall Spoils states "Soils, slurry saturated soils, concrete and other materials generated during wall excavation and concreting.". Since the Slurry wall toes is at El. 654 which is 23 +/- feet into bedrock, does the word "soil" in the definition include rock?

A14: See response to Question 13.

Q15: Drawing 430-SOE-08. The drawing shows the horizontal rebar in the slurry wall panels as being #7 bars on 12" centers. Experience has shown that using #7 bars for these types of stirrups can be problematic.
Question- Can the Contract Drawings be revised to show #6 bars on 9" centers?

A15: Equivalent amounts of steel area on smaller spacing will be accepted during shop drawing review. Contract drawings to remain.

Q16: Specification 31 56 00 1.05.C titled Slurry Wall Pre-Construction Meetings
Question: What is the Engineer's expectation regarding the number of these

meetings? For example, will there be just one meeting before the construction of the first panel or one before the first primary panel and one before the first closure panel?

A16: One meeting before the first panel only.

Q17: Drawing 430-SOE-08. The drawing shows the thickness of the slurry wall to be 4'-0" = 48". The industry standard for slurry wall excavation clamshells and mills is 1200 mm = 47.25".
Question- Is a slurry wall constructed with 1200 mm width clamshells and mills acceptable?

A17: Contractor shall bid what is shown on the Contract Documents. Alternative equipment sizes can be submitted by the Contractor in the Work Plan and will be reviewed by the Owner at that time.

Q18: Specification 31 56 00 1.07.C.1. states : "Check verticality every 15 feet of depth in each panel during excavation".
Question 1 - Does this requirement mean checking verticality every 15 feet of depth after the panel has been excavated to the panel tip (i.e. full depth) or does this mean to check the verticality every 15 feet as the panel excavation proceeds?
Question 2 - If the check is to be made every 15 feet as the panel excavation proceeds can check be made using the excavation equipment on-board real time monitoring system or does it require withdrawal of the excavation tool and use of the Koden ultrasonic measurement tool?

A18: 1. As the excavation proceeds.

2. Checks made during excavation may be made with on-board monitoring equipment.

Q19: Drawing 430-SOE-07. The drawing shows the bottom of the slurry wall at El. 654.0.
Question - If a mill is used to excavate the panel do the bottom of the mill cutting wheels have to reach El. 654 or do the centerline of the wheels have to be at El. 654?

A19: Centerline.

Q20: Specification 31 56 00 2.02.A.1 states : "Use equipment capable of excavating through the range of the expected ground conditions as described in the GBR." The GBR, Section 6.1.1.1 - Fill states " Fill contains varying amounts of clay, silt, sand, gravel, cobbles and boulders, mixed with man-

made debris such as wood, steel, slag, concrete and brick."
Question- Industry standard clamshells, chisels and mills may not be able to excavate through certain man-made instructions including steel, slag and reinforced concrete. If the panel excavation encounters materials that the clamshells, chisels and mills cannot excavate will the clearing /excavation of these materials / obstructions be paid for under Bid Items 13, 18 and/or 19?

A20: Stoppages due to obstructions encountered below the top ten feet of slurry wall panel excavation will be paid under Pay Item 13.

Q21: Specification 31 56 00 2.02.A.3 states : "Use equipment capable of continuously cutting the adjacent previously placed slurry wall concrete, so as to obtain a clean construction joint between primary and secondary panels."
Question- There are numerous references elsewhere in the same specification referencing the use of End Stops, specifically Section 1.04.A.4.b.7.a. Can the Contractor form the joint between the primary and secondary panels using end stops or do the joints need to be "cut" using a mill?

A21: Per Section 31 56 00 Part 1.04.A.4.b.7 Details of Slurry Wall Panel Joints, "Slurry wall panel joint type shall be selected by the Contractor based on their preferred means and methods. The selected joint type must meet the performance requirements of this Specification. Submittal shall include project references showing successful use of proposed joint type in similar applications as for this Project." The contractor may propose an end stop assembly at the joints or a "cut" joint using a mill in their Slurry Wall Method Statement and Shop Drawings submittal. The proposed panel joint type shall meet the requirements of Part 1.04.A.4. The Contractor's proposed joint detail will be evaluated during the construction submittal phase.

Q22: Specification 31 56 00 2.02.A.5.a states : "Approved equipment includes Koden Electronics Company Model DM-684 or approved equal."
Question- Will the Contractor's proprietary on-board real time monitoring instrumentation that has a proven track record of success on other similar projects be considered an approved equal to the Koden?

A22: The proposed equipment shall be included in the Contractor's Work Plan submittal. If the contractor demonstrates the proposed equipment has similar capabilities and a proven track record on similar projects, it will be considered an approved equal.

Q23: Specification 31 56 00 3.01.C.2.e states : "Do not excavate the Secondary (Closing) Panel until concrete in the adjacent Primary Panels has been in place for a minimum of 72 hours and has achieved sufficient strength to enable it to withstand the effects of the excavation."

Question- The 72 hour limitation seems overly long given successful industry experience on similar projects. Can the 72 hour limitation be reduced to ideally 36 hours or at least to 48 hours?

A23: Contractor may propose alternative concrete placement schedule in their submitted Work Plan. Alternative procedures and schedules will be evaluated during the construction submittal period.

Q24: Specification 31 56 00 3.01.C.5.a states : "Begin placing tremie concrete within 24 hours of completing excavation..." It is not always practically possible to begin tremie concrete placement within 24 hours of completing the excavation for multiple reasons including weeks, holiday,, weather etc. Question - Can this requirement be revised to say something like "Begin concrete placement as soon as practically possible after completing the excavation"?

A24: Contractor may propose alternative concrete placement schedule in their submitted Work Plan. Alternative procedures and schedules will be evaluated during the construction submittal period.

Q25: Specification 31 56 00 3.01.C.5.a states : "Begin placing tremie concrete....within four hours of setting the reinforcing cage in the trench." This requirement as a practical matter means the reinforcing cage and tremie concrete have to be installed / placed in the same day. It would be hard to achieve this even working a 12 hour shift. To avoid working extremely long hours on pour days a process where you place the reinforcing cage the day before the tremie pour and recirculate the bentonite continuously overnight has been successful on many previous projects.

Question - Can this requirement be rewritten to allow placement of tremie concrete to begin within 18 hours after the placement of the reinforcing cage in the trench as long as the bentonite in the trench is continuously recirculated until the tremie pour begins?

A25: Contractor may propose alternative concrete placement schedule in their submitted Work Plan. Alternative procedures and schedules will be evaluated during the construction submittal period.

Q26: Specification 31 56 00 3.01.C.5.c states : "Use minimum one tremie pipe for each 7 feet of wall length."The DFI Guidelines for Structural Slurry Walls recommends using 2 tremie pipes for standard panels and specifically discourages the use of more than 2 tremie pipes for standard panels. In this context the standard panel is a triple bite panel in the 22-24 ft long range. Question Can this requirement be revised to say that 2 tremie pipes can be

used in a triple bite panel so long that concrete will not need to flow more than 7 feet laterally in either direction? (This will mean that 2 tremie pipes can be used for up to a 28 foot long panel)

A26: The proposed tremie pipe layout and placement procedure should be provided by the contractor in the submitted Work Plan. The proposed layout and procedure will be evaluated during the construction submittal period.

Q27: Specification 31 56 00 2.01.A.1.b.2 states : "Initial slump: 8 inches minimum." However Specification 03 30 00 Table 03 30 00-4 lists the Slump Range for the Slurry Wall of 4"-8". Footnote 4 of this table states "Maximum slump after addition of high range water reducing admixtures shall be 8".
Question - Please confirm that the 8" minimum slump listed in 2.01.A.1.b.2 is the correct requirement for the Slurry Wall concrete. (Note that current industry practice is for concrete slumps greater than 8", sometimes much greater than 8").

A27: Slump requirement for slurry wall is revised in Specification 03 30 00 to be per Contractor means and methods for proper placement and consolidation of panels. Refer to Item 2.4 of Addendum No. 6.

Q28: Specification 31 56 00 2.01.A.2 states : "All other mix parameters, including....air content...are to be determined by the Contractor ..." However Specification 03 30 00 Table 03 30 00-4 lists the Air Content for the Slurry Wall as being 6.0 percent."
Question - Please confirm that the air content for the Slurry Wall concrete is to be determined by the Contractor?

A28: Air entrainment is not required for the slurry wall. Please see footnote 3.

Q29: Drawing 430-SOE-03. Slurry Wall Shaft Note #1 states that the final panel configuration is to be determined by the Contractor.
Question - If the Contractor uses a panel configuration different from that shown on Drawing 430-SOE 05 is the Owner still responsible for the design and performance of the Slurry Wall if concrete and reinforcing steel are unchanged?

A29: The minimum required slurry wall design (min panel thickness and rebar sizes) have been developed by the Owner's Engineer and are shown on the Contract Drawings. The Contractor may proposed alternative slurry wall panel layout (rotated orientation of panels, alternative panel widths, alternative joint detail, etc.) to accommodate their construction means. Any proposed alternative panel layout is subject to review and approval by the Owner and must meet the minimum design requirements (panel thickness, reinforcement, etc.) shown on the Contract documents..

Q30: Specification 31 33 01 Section 1.05.A.2.a - requires the drill crews to have 40-hour Hazardous Waste (HAZWOPER) training.
Question 1 - Since the Vertical Rock Reinforcement dowels will be drilled from the ground surface why is 40-hour HASWOPER training needed?
Question 2 - Are these crews expected to encounter hazard waste during the drilling process?

A30: 1. Contract Documents stand as written.

2. If encountered, payment for removal and disposal will be handled under Pay Item 15. Management and handling of hazardous materials is provided in Section 31 23 00.

Q31: Specification 31 63 33 Section 1.05.A.2.b - requires the drill crews to have 40-hour Hazardous Waste (HAZWOPER) training.
Question 1 - Since the Micropiles will be drilled from the ground surface why is 40-hour HASWOPER training needed?
Question 2 - Are these crews expected to encounter hazard waste during the drilling process?

A31: 1. Contract Documents stand as written.

2. If encountered, payment for removal and disposal will be handled under Pay Item 15. Management and handling of hazardous materials is provided in Section 31 23 00.

Q32: Specification 31 63 33 Section 1.06.A.2.c states "Perform vacuum excavations…..in the top 10 feet of each micropile location. "Section 3.02.C.1 states "Where drilled boreholes are located within five feet horizontally of existing underground utilities, use vacuum excavation methods to excavate and clear utilities within the maximum anticipated depth below ground surface."
Question - Please clarify if vacuum excavation is needed to 10 feet deep at all micropile locations or just those micropiles that are located with five feet horizontally of existing underground utilities.

A32: Vacuum excavation is required at micropile locations installed within five feet horizontally of existing utilities.

Q33: Specification 31 63 33 Section 3.02.C.1 states "Use drilling equipment and methods suitable for the conditions encountered."
Question - Can the Contractor drill the micropiles using rotary-percussive duplex drilling methods that utilize a down-the-hole-hammer and air flush?

A33: Selection of micropile drilling methods suitable for anticipated ground conditions is

the responsibility of the Contractor.

Q34:. Specification 31 23 20 Section 3.05.D states ""Remediate unacceptable injection holes at no additional cost to the Owner. Unacceptable injection holes to be determined by the Owner and remediation methods shall be submitted and approved by the Owner.""
Please clarify the conditions that would define an unacceptable injection hole. The current language leaves room for subjectivity and unilateral decision making.

A34: This will be determined on a case by case basis, taken into account the actual performance of the injection hole and assessment of the specification requirements and application of the approved methodology.

Q35: Specification 01 22 00 Section 3.1.G.4.a "The hourly measurement will be for crew hours only performing grouting operations under this task. The hourly measurement will be for actual hours grouting, which is determined by water pressure testing performed in accordance with the specifications. A crew hour encompasses all resources combined for one hour. "Confirm that hourly measurement will also be determined by grouting hours in addition to water pressure testing. As the statement reads today, it implies grouting hours will be determined by water testing only.

A35: Hourly measurement of crew hours is inclusive of hours spent grouting. Refer to Item 2.1 of Addendum No. 6.

Q36: Specification 01 22 00 Measurement and Payment, Section 3.1.C.5.a states "Pile load test where either the testing system, test pile, or reaction (anchor) pile fails before test is complete."
Question - If the Contractor installs the Owner's design as shown on Drawing 430-S-49 and per the approved Work Plan it does not seem fair or equitable that he should not be paid for installation and testing of the failed pile. Please consider revising this requirement to allow payment for the pile and pile load test in this situation.

A36: Payment for failed load tests due to poor workmanship or other reasons under the Contractor's control as determined by the Owner will not be considered for payment. However, payment for failed pile load tests that are a result of unforeseen conditions or circumstances that are under the control of the Owner will be reviewed and considered for payment.

Q37: Specification 31 63 33 Section 3.03.A.3.b states "Perform proof load tests on 7 production micropiles as indicated on the drawings in accordance with section 31 63 33. Divide the total number of micropiles into lots and utilize a random selection method to select one proof test pile from each lot."

Question - Are the 7 proof load tests to be performed at the locations shown on Drawings 000-C-17, 430-S-47 & 430-S- 48 or selected at random as described in the quoted specification language?

A37: At the locations shown on the drawings. Refer to Item 2.3 of Addendum No. 6.

Q38: Specification 31 63 33 Section 3.03.A.3.e states "Perform the required Proof Load Testing by loading piles in compression at the loads and increments in Table B."
Question - Can the piles to be proof load tested be tested in tension as already allowed in Section 3.03.A.2.d for the Verification piles?

A38: Proof load testing of piles in tension is acceptable.

Q39: Specification 31 63 33 Section 3.03.A.3.g states "For failed micropiles and further installation of other micropiles, modify the construction procedure. Modifications may include, but are not limited to, revising the installation method, the installation equipment, the installed material, installing replacement micropiles, or incorporating micropiles at not more than 50 percent of the maximum load attained. Costs for modifications due to non-performance of the accepted Work Plan will be at the Contractor's expense, including modifications to installation procedures, additional production micropiles, additional verification tests and verification and/or proof load testing."
Question - If the Contractor installs the Owner's design as shown on Drawing 430-S-49 and per the approved Work Plan it does not seem fair or equitable that he should not be paid for installation and testing of the failed pile and modifications to his procedure, equipment and material. Please consider revising this requirement to allow payment for the pile, pile load test and any required modifications in this situation.

A39: See response to question #36. Payment for piles that do not meet acceptance criteria will be subject to review by the Owner. Piles that do not meet criteria due to poor workmanship or other reasons under the Contractor's control as determined by the Owner will not be considered for payment.

Q40: Specification 31 63 33 - States that micropiles may be verification tested in compression or tension. The Article 1-Bid Form description "Static Compression and Tension Verification Pile Load Test" is misleading and can be implied that it should be tested in both compression and tension. Please clarify.

A40: Proof load testing of piles in either compression or tension is acceptable and payment at the unit price bid will be for either test method.

Q41: Drawing 430-S-49, Detail 1 - Is the 10.75" OD x 0.50" wall casing shown permanent or can it be withdrawn during grouting of the micropile?

A41: Wall casing is permanent.

Q42: The control point data table shows both "Plant" and NAVD88 elevations. These elevations differ by 0.75ft, please confirm which elevation is the basis for the rest of the elevations shown on the drawings.

A42: Elevations are in the Plant datum

Q43: Specification 01 22 00 - Pay Item 14– Specific Allowance #3 – Drilling Through Obstructions for Micropile Installation states:

1. Obstructions for Micropile Installation are defined in the Contract Documents as natural or manmade objects that are encountered within the site overburden (Fill and Alluvium) soils which stop drilling progress of a micropile for more than 2 hours despite the Contractor's reasonable and diligent effort to overcome it, as determined by the Owner.

2. This pay item will be measured per crew hour as provided below:
a) The hourly measurement will be for actual hours expended to remove or otherwise advance micropiles through obstructions as defined above, which takes more than 2 hours to clear during drilling. For each micropile, clearing of obstructions by the Contractor that does not significantly impact drilling progress, and takes less than 2 hours to break apart, clear, and/or remove, is incidental to the Work and will not be paid separately. Payment to include reimbursement for indirect costs due to Contract Time extensions and/or critical path delays incurred as a result of drilling through obstructions, as determined by the Owner.

3. Payment will be made for obstruction removal time at each micropile in excess of 2 hours.

Question 1 – Can the Owner amend this section by changing the 2-hour requirement to1-hour?

Question 2 – Will damages to the Contractor's tools and equipment sustained while attempting to drill through the obstruction be paid for under this allowance?

Question 3 - While drilling through the obstruction, only part of the Micropile crew and equipment will be involved in the removal of the

obstruction. However, some or all the remainder of the Micropile crew and equipment will still be on site but not be able to perform meaningful contract work - i.e. they will be in “standby”. Can the cost of the crew and equipment not engaged directly in the drilling through the obstruction -i.e. the portion of the crew and equipment on "standby" - be paid for under this allowance?

Question 4 – Will the Contractor’s on-site supervision, field engineers and filed office be paid for under this allowance?

Question 5 - If the Contractor’s cost exceeds the $50,000 Allowance, will the quantity of dollars be adjusted to reflect the actual dollar amount incurred by the Contractor; or is the Allowance limited to the dollar amount identified in the Bid Form?

Question 6 – Will the Contractor be granted a time extension to the Contract Duration equal to the number of crew hours spent drilling through the obstruction?

A43: 1. No.

2. The contractor is responsible for selection of proper equipment/tooling. The causes of damages will be reviewed should an event occur.

3. Stand by time will be reviewed should an event occur and payment if approved would be through this Pay Item.

4. On-site supervision, field engineers, and field office staff will be considered for measurement and payment under this pay item provided the personnel are directly engaged with supervision and field support of contractor’s micropile operations. These costs are included in the Markup fees; 3.32 describes markup fees as but is not limited to the following costs, fees, and expenses: home office, insurance, branch office, field office, project management, superintendents, estimating, engineering, training and safety meetings, coordination, expediting, purchasing, detailing, legal, accounting, data processing or other administrative services, shop drawing, permits, taxes, comprehensive general liability insurance, auto insurance, umbrella insurance, and subcontractor bond premium.

5. If allowance value is exceeded, a change order would be required.

6. Contract Time Extensions will be allowed for time spent removing obstructions that is compensable under Pay Item #14. Time extensions will be subject to review and approval of the Owner and requirements of GCC Article 3.34 and Div 01 General Requirements.

Q44: Per Specification Section 07 10 50, 3.06 (A): "Where reinforced concrete and/or embedded steelwork is to be placed against the waterproofing membrane provide a signaling layer on the exposed waterproofing membrane surface, to give a visual indication of any mechanical damage." According to the contract drawings, the entire waterproofing membrane is shown to be directly against reinforced concrete surface. Please confirm the signaling layer is required throughout the entire surface area of waterproofing membrane?

A44: Confirmed

Q45: How are the precast concrete floor beams connected to the vertical columns? Please provide the necessary construction details.

A45: Refer to Addendum No. 4.

Q46: No pre-grouting or probe grouting is indicated for the tunnel junction chamber. Please confirm the designed control of water inflow at this area.

A46: The contractor is responsible for installing groundwater control measures and pre-excavation grouting per the requirements of the specifications.

Q47: Article 3.32(E)(9) refers to "Paragraph 3.55." Please confirm that this should read "Paragraph 3.56."

A47: Refer to Item 1.4 of Addendum No. 6.

Q48: Detail 2 on Drawing 430-A-28 shows the insulated metal panel on the walls and ceiling, while room finish schedule indicates concrete ceiling within room 401. Please clarify the ceiling finish type for room 401.

A48: In Room 401, the insulated metal panel at the ceiling is intended to provide insulation for the breezeway above. The extents of the metal panel in the east/west direction should be from 1' south of grid E and 1' east of grid F. In the north/south direction, it should extend from the wall of the wetwell at the south to the wall of the discharge chamber at the north. Refer to Item 4.2 of Addendum No. 6.

Q49: Drawing 430-A-09 General notes 2: Cross over stairs at pipes. Please provide detail of the cross over stairs.

A49: The design intent at these locations is to use a ballasted step over system that does not penetrate the roof system. Basis of design system is the Kee Step Mini Stepover. Refer to Item 4.2 of Addendum No. 6.

Q50: Drawing 430-A-06 by note 3, entrance platform is surrounded with 42" Aluminum guardrail system with toe board but also partial marked with removable guardrail. Does it mean the removable guardrail is aluminum with toe board? Please clarify.

A50: Yes, the removable section of the guardrail is to also be an aluminum guardrail with toe board.

Q51: The Door Schedule provided on drawing 430-AS-01 denotes door type "DNG". Please provide further clarification of requirements for this door type.

A51: The DNG note on the door schedule refers to double door/narrow glass. Other requirements are as scheduled.

Q52: In the S489_SPC_VOL2_20250514, Div 01-23 specs, section 01 11 00 – Summary of Work, article 1.02.B.16 states “Demolition, relocation, modifications and new process piping systems”. The drawing set S489_07_DWG_M_BidSet_20240514 which we are pricing on is inclusive of new construction only. If there are process piping systems requiring demolition, relocation & modifications, please advise which drawings they are included in.

A52: Process piping includes various buried piping on civil drawings which requires demolition, relocation and modification as an example.

Q53: In Addendum 2, page 58, presented as EPSM roofing system. Specification is calling for 4 ply build up system. Please clarify which System to be used in this project.

A53: The EPDM note on the Prebid Presentation issued in Addendum 2, page 58 is incorrect. Provide roof per specifications.

Q54: Regarding 10 14 00 Signage, there is requirement for building signage, we can’t locate it on Building elevation, please provide detailed design.

A54: Building Signage location will be coordinated with ALCOSAN and provided in a future addendum.

Q55: With the drawings/sections provided it is unclear where the slabs have elevation changes. Can a table be provided that shows micropiles individually numbered and a corresponding top of pile elevation for each.

A55: Drawings 430-S-47 and 430-S-48 have been revised. Refer to Item 4.1. of

Addendum No. 6.

Q56: Table 6-4 of the Geotechnical Baseline Report (GBR) lists the Minimum, Maximum and Average baseline values of the Unconfined Compressive Strength (UCS) for the bedrock to be encountered in the construction of the WWPS Shaft.
Table 5 of the Geotechnical Data Report (GDR) lists 19 UCS values – ten (10) for Sandstone, two (2) for Shale and seven (7) for Siltstone.
The Table 6-4 GBR baseline values for Sandstone and Shale appear reasonable when compared to the actual UCS data contained in Table 5 of the GDR.
However, for the Siltstone, the baseline values in Table 6-4 of the GBR do not seem reasonable when compared to the actual UCS values listed Table 5 of the GDR.
Table 6-4 of the GBR lists the following Baseline UCS values for Siltstone:
- Minimum = 2,500 PSI
- Maximum = 15,000 PSI
- Average = 9,000 psi

Table 5 of the GDR shows the following related to the UCS values for the Siltstone:
- Minimum = 3,164 PSI
- Maximum = 10,649 PSI
- Average = 5,722 psi

Question #1 – Was any other data other than the UCS values in Table 5 of the GDR used, consulted and/or relied upon in arriving at the Table 6-4 baseline UCS values? If, yes please provide this data.
Question #2 – Based on the GDR Table 5 GDR data, we recommend revising the GBR Table 6-4 baseline UCS values for Siltstone to be:
- Minimum = 3,200 PSI
- Maximum = 10,700 PSI
- Average = 5,800 psi

Please confirm if the above or similar changes to the GBR baseline values for Siltstone can be made.

A56: GBR stands as written. Also refer to Item 3.1 of Addendum No. 6.

Q57: Reference spec section 07 10 50 Shaft Membrane Waterproofing System paragraph 1.01.B.1.a. : Spec calls for SikaPlan WP 1130 by SIKA Corporation, but there are three available thicknesses of this membrane. The manufacturer recommends WP 1130-25C or WP 1100-25HL2. Please confirm which thickness of PVC membrane is required for this project.

A57: Minimum thickness required is specified in 07 10 50.

Q58: Reference Addendum 3 Q&A # 21 : The only joints indicated, for the outer shaft wall and inner core wall, are horizontal joints. Our question is : Are vertical joints permitted or required in the outer shaft wall and inner core wall?

A58: Yes, vertical joints are permitted in the outer shaft wall and wet well walls. Limitations on locations of vertical joints are indicated on the Contract Documents. Contractor may propose additional vertical joint locations, subject to the review and approval of the Engineer.

Q59: Reference Addendum 3 Q&A # 22 : This jointing requirement seems excessive for the slabs (mat foundations) and impractical for elevated slabs. Please consider and provide an alternative.

A59: Location and spacing of construction joints are as indicated on the Contract documents. The Contractor can propose changes to the joint layout in writing during construction, which will be subject to review and approval by the Engineer. Final jointing layout proposed by the Contractor will be reviewed in conjunction with approved concrete mix design and other relevant submittals.

Q60: Specification 03 10 00, Paragraph 1.03.A.4.e.2 dictates formwork for circular structures shall be a true radius and chorded formwork will not be permitted for circular structures. Please reconsider this restriction. This structure will not encounter high velocity flow, but it will act like a holding tank with levels gradually rising and falling. Requiring truly radius formwork for this structure will result in increased bid cost.

A60: Contract requirements to remain.

Q61: Spec section 31 71 16 page 13 lists the allowable peak particle velocity for nearby features. The existing river wall appears to be the closest structure to the shaft. Where will the peak particle velocity be measured from? Will it be to the nearest face sheet or will it be measured to the nearest dead man sheet from the shaft?

A61: See 430-GT-02 for location of mobile seismograph at the existing river wall.

Q62: Please advise if the 1800E Electrical Contractor or the 1800G General Contractor is responsible for supplying, furnishing, and the insulation of all field-mounted instrumentation including devices, cabling, conduits, pathways, and programing.

A62: Refer to Section 01 11 00.

Q63: Reference detail 1B on drawing 430-A-20 Elevator Section-Continuation, specifically the elevator opening on the roof plan elevation. The bottom of the elevator door opens at the roof plan elevation, but there is a step directly in front of this opening obstructing the elevator opening. Please provide a revised detail to allow for elevator egress.

A63: The elevator door at the roof is intended to open onto the step at the roof level. Refer to Item 4.2 of Addendum No. 6.

Q64: Reference Radial Bridges Cranes CRN001-430 and CRN002-430. In addition, reference the corresponding specifications for these cranes in section 41 22 13.13-1. There are operating requirements for the materials of the beams and crane, but none for the actual crane details (Capacity, Hoist Vertical Lift, etc.) as there are in the other crane type sections. Please provide the specific Operating Requirements for these cranes.

A64: Operating Requirements for these cranes are included in the re-issued specification. Refer to Item 2.6 of Addendum No. 6.

Q65: Reference specification section 01 22 00 Measurement and Payment paragraphs 1.5.D&E : Please confirm that this approximate value of $150,000 is to be included for Schedule of Values line items for O&M manuals and As-Builts in our base bid amount.

A65: O&M Manuals and As-Built drawings are part of the Base Bid for each contract. The Schedule of Values is to reflect a percentage of the total Base Bid as stated for the O&M Manuals and As-Built drawings.

Q66: Specification Section 31 11 00 1.06 (A) states "Provide receipts for disposal of all materials removed from the site." Receipts would be provided from disposal sites for any hazardous material disposal, but not for clean fill. Please revise this clause accordingly.

A66: Refer to Item 2.2 of Addendum No. 6.

Q67: Spec section 31 71 16 page 11 requires the Blaster-in-Charge to be a registered professional engineer in the Commonwealth of Pennsylvania, with a minimum of five years of experience in preparing blasting plans, handling of explosives, blasting of rock for underground construction, and monitoring of air blast and ground vibrations. This is a very unusual requirement for this position and will be extremely difficult to find an individual who is a registered PE and has five years experience in blasting. Normally these individuals are licensed blasters with years of hands-on experience in their craft. They are not registered professional engineers. Please consider removing the PE requirement for this position.

A67: Specification revised, Refer to Item 2.9 of Addendum No. 6.

Q68: Specification 01 22 00 - Pay Item 13– Specific Allowance #2 – Stoppage to Slurry Wall Trench Excavations states:

1. A stoppage is defined as an obstruction within the slurry wall panel excavation that reduces the excavation rate to less than 6 vertical inches over a 4-hour period and requires the employment of special tools and/or excavation techniques and procedures, including drilling, excavating, or coring, to remove, break up or push

aside the obstruction.

2. Payment for this pay item will be measured per crew hour as provided below:
a. The hourly measurement will be for crew hours only performing operations for drilling, excavating, coring through, breaking up, pushing aside, or otherwise removing the obstruction found during installation of the slurry wall. A crew hour encompasses all resources combined for one hour.

3. Payment to include reimbursement for indirect costs due to Contract Time extensions and/or critical path delays incurred as a result of drilling through obstructions, as determined by the Owner.

As written this pay item only allows for payment if the obstruction reduces the panel wall excavation rate to less than 6 vertical inches over a 4-hour period and requires the "employment of special tools and/or excavation techniques and procedures". This implies that the Contractor must attempt to remove the obstruction using their "regular" tools and excavation techniques for up to four hours before the obstruction is considered a stoppage. The current Contractor's "regular" excavation tools and techniques to excavate the Slurry Wall based on industry bets practice will include using: a) Clamshell in soil (i.e. fill, alluvium), b) Steel chisel to help break up boulders and obstructions in the soil (i.e. fill and alluvium) c) "Mill" (i.e. hydromill, hydrofraise or cutter) in the residuum and bedrock. Using a clamshell and chisel on an obstruction for four hours will likely result in significant damage to this equipment. Using a mill to try to excavate through large boulders, reinforced concrete, steel, etc, will not only be likely to be unsuccessful but also result in very costly damage to the mill's hydraulic cutting motors, cutting wheels, etc.

Question 1 – Can the Owner amend this section (and related language in the GBR and Specification 31 56 00 Slurry Walls), to read "A stoppage is defined as an obstruction within the slurry wall panel excavation that reduces the excavation rate, using the Contractor's "regular" excavation tools and techniques to less than 6 vertical inches over a one-hour period and requires the employment of special tools and/or excavation techniques and procedures, including drilling, excavating, or coring, to remove, break up or push aside the obstruction.

Question 2 – Will damages to the Contractor's "regular" tools / equipment sustained while attempting to remove the obstruction during the 4-hour period be paid for under this allowance?

Question 3 - While removing the obstruction, only a part of the Slurry Wall crew and equipment may be involved in the removal of the obstruction. However, it is possible that all or at least a majority of remainder of the the Slurry Wall crew and equipment will still be on site but not be able to perform meaningful contract work - i.e. they

will be in “standby” waiting for the completion of the obstruction removal operation. Can the cost of the crew and equipment not engaged directly in the removal of the obstruction -i.e. the portion of the crew and equipment on "standby" - be included in the “resources” making up a "crew hour" and therefore paid for under this allowance?

Question 4 – Will the Contractor’s on-site supervision, field engineers and field office be included in the “resources” making up a "crew hour" and therefore paid for under this allowance?

Question 5 - If the Contractor’s cost exceeds the $250,000 Allowance, will the quantity of dollars be adjusted to reflect the actual dollar amount incurred by the Contractor; or is the Allowance limited to the dollar amount identified in the Bid Form?

Question 6 – Will the Contractor be granted a time extension to the Contract Duration equal to the number of crew hours spent removing the obstruction? The GBR states “Contractor shall select means and methods capable of constructing the slurry wall panels through soil, obstructions, and bedrock with strengths up to 25,000 psi”.

Question 7 – If the Contractor encounters an obstruction as defined in Pay Item 13, will the Contractor be paid for under this pay item to remove the obstruction even if the obstruction has a UCS less than 25,000 psi?.

A68: 1. Regular tooling and special tooling is included within the 4 hour period. No change to Spec or GBR.

2. The contractor is responsible for selection of proper equipment/tooling. The causes of damages will be reviewed should an event occur.

3. Stand by time will be reviewed should an event occur and payment if approved would be through this Pay Item.

4. On-site supervision, field engineers, and field office staff will be considered for measurement and payment under this pay item provided the personnel are directly engaged with supervision and field support of contractor’s slurry wall operations. These costs are included in the Markup fees; 3.32 describes markup fees as but is not limited to the following costs, fees, and expenses: home office, insurance, branch office, field office, project management, superintendents, estimating, engineering, training and safety meetings, coordination, expediting, purchasing, detailing, legal, accounting, data processing or other administrative services, shop drawing, permits, taxes, comprehensive general liability insurance, auto insurance, umbrella insurance,

and subcontractor bond premium.

5. If allowance value exceeds $250k, a change order would be required.

6. Contract Time Extensions will be allowed for time spent removing obstructions that is compensable under Pay Item #13. Time extensions will be subject to review and approval of the Owner and requirements of GCC Article 3.34 and Div 01 General Requirements.

7. A stoppage is not conditional on the strength of an obstruction.

END OF ADDENDUM No. 6

ATTACHMENT – A

Addendum No. 6 Specifications

SECTION 01 22 00
MEASUREMENT AND PAYMENT (LUMP SUM AND UNIT PRICES)

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Defines how work items are measured and paid for on Lump Sum and Unit Price Contracts. These items include unit price, lump sum price, and allowance payment items.
   2. Receive payment for work after it is installed. Payment for material on hand can only be paid for if allowed by the Agreement, the General and/or Special Conditions.
   3. Partial payment may be requested for items partially installed when agreed to by the Owner.

1.2 UNIT PRICE ITEMS

A. Quantity and measurement estimates stated in the Bid Form are estimates for bidding purposes only. Actual payments shall be based on actual quantities installed, in-place, as measured and/or verified by the Construction Manager.

B. Unless otherwise stated in the Contract Documents, the bid unit prices shall be in effect throughout the contract duration. When the variance between the estimated quantities and the actual installed quantities is more than 25%, the Contractor or the Owner may negotiate a change to the Unit Price. That change will be made in accordance with the Change Order process as defined in the Contract Documents.

C. Except as defined above, make no claim, nor receive any compensation, for anticipated profits, loss of profit, damages, or any extra payment due to any difference between the amounts of work actually completed, or materials or equipment furnished, and the estimated quantities.

D. If the added quantities will result in payments that exceed the Contract Quantity, a Change Order will need to be executed before payment is made for the added quantities.

E. Assist Construction Manager by providing necessary equipment, workers, and survey personnel as required to measure quantities.

F. Unless stated in the Contract Documents, measured quantities shall be rounded to the nearest whole integer.

G. Measurement:
   1. Measurement for progress payment shall be made by, or approved by, the Construction Manager based on the actual quantities installed. The actual quantities installed can be adjusted for corrections to previous calculations, incomplete elements or components if agreed to in advance and in writing by the Construction Manager.
   2. Unless otherwise provided for in the Contract Documents, unit price items are all inclusive of all related work, direct and indirect costs, to provide a complete and functional item.
   3. The final measurement shall be based on actual installed quantities, jointly measured, and agreed to by the Contractor and the Construction Manager. Quantities can be adjusted (increased or decreased) based on a final calculation of quantities by the Construction Manager.

H. Payment:
   1. Progress payments shall be in accordance with the Contract Documents based on actual quantities installed and paid at the bid unit price.
   2. The final payment shall be based on actual quantities, fully installed, tested and placed into service, paid at the bid unit price.

1.3 LUMP SUM ITEMS

A. Payment for Lump Sum work completed under this Contract will be made at the lump sum bid. The Lump Sum shall include the furnishing of all labor, tools, equipment and materials and the performance of all work required to complete the Contract as indicated and specified in accordance with all requirements of the Contract Documents and to the satisfaction of the Construction Manager. Should there be discrepancies among Contract Documents, it shall be assumed that the more costly and higher quality work performed, as solely judged by the Construction Manager, was the basis of the bid; no additional payment shall be required from the Owner.

B. Before the first Application for Payment, the Contractor shall submit to the Construction Manager a Schedule of Values allocated to the various portions of the Work, as set forth in this section and supported by such data to substantiate its accuracy as the Owner may require. This Schedule of Values, when approved by the Owner shall be used as the basis for the Contractor's Applications for Payment and only for this purpose.

C. No progress payments will be made by the Owner until the Progress Schedule, including the Schedule of Values, has been submitted to and approved by the Owner.

D. Assist Construction Manager by providing necessary equipment, workers, and survey personnel as required to measure quantities.

E. The Contractor agrees that it will make no claim for damages, anticipated profits, or otherwise on account of any difference between the amounts of work actually performed and materials actually furnished and the estimated quantities.

1.4 ALLOWANCES

A. Allowances if indicated in the Bid Schedule are defined in the Contract Documents. No work may be performed under an allowance item without prior written approval of the Owner.

B. Allowance is for exclusive use of Owner for changes as a result of changed conditions, design refinements, and unanticipated design issues. Not for use by Contractor as Contractor's construction contingency.

C. Owner approval of adjustment is required prior to authorization by the Construction Manager of progress payments from Contingency Allowance. Adjustments will include either:
   1. Contractor's measured time and materials amount
   2. Contractor's related costs, and reasonable overhead and profit as stipulated in Contract Documents and Article 3 of the General Contract Conditions when Work is performed on the cost of the work basis.

D. Authorization for payment shall be supported by all required labor and material backup per Article 3 of the General Conditions.

E. Any unused balance of the allowances shall revert to the Owner upon completion of the project. Prior to final payment, the original amount provided for allowances shall be

adjusted to actual costs by deductive/final adjusting Change Order, adjusting the Contract Price, accordingly.

F. Contractor shall make no claim, nor receive any compensation, for anticipated profits, loss of profit, damages, or any extra payment due to any unexpended portion of the allowances.

G. The measurable and allowable costs for work performed under an allowance item(s) shall be limited to the actual costs associated with that allowance item unless otherwise stated in the specific measurement and payment provisions under allowance items.

H. Time impacts associated with Specific Allowances shall be provided in the form of a zero dollar time extension for only those activities on the critical path based on actual time of impact.

1.5 SCHEDULE OF VALUES

A. The Schedule of Values is a statement furnished by the Contractor to the Construction Manager. It shall be submitted within seven calendar days prior to the Preconstruction Conference and shall reflect the portions of the Contract Price allocated to various portions of the Work.

B. Once accepted by the Construction Manager, the Schedule of Values shall be the basis for reviewing Payment Applications by the Contractor in accordance with the Schedule of Payments in the Contract Provisions.

C. This Schedule will contain all of the major components making up the work, shall be coordinated with the Schedule of Payments, and shall contain, as a minimum, the following information:
   1. Organization of Work Items by Specification; Section; Reference.
   2. For all major Work Items/Components
      a. Listing of Labor Value
      b. Listing of Material/Equipment/Deliverable Value
      c. Reflect all activities shown on the Project Schedule.
   3. Show all Subtotals and Totals as directed by the Construction Manager to support the Payment Application Form.

D. The Contractor shall include a line item in the Schedule of Values for the submission of approved Operation & Maintenance Manuals in the amount of 0.025% of the Contract Value or $2,500, whichever is greater.

E. The Contractor shall include a line item in the Schedule of Values for the submission of approved as-built drawings with an associated value of 0.05% of the Contract Value or $5,000, whichever is greater.

F. The Contractor shall utilize the following work breakdown structure (WBS) for the creation of the Schedule of Values and CPM Schedule:
   1. Mobilization/Demobilization
   2. O&M Manuals
   3. As-Built Drawings
   4. General Conditions
   5. 000 Site Work
   6. 410 Energy Recovery Facility
   7. 430 Wet Weather Pump Station (all work in 430 not including 431 and 432)
   8. 431 Super Structure (above grade)

9. 432 Pump Station Shaft (below grade)
10. 500 Main Pump Station
11. 509 East Headworks Influent Conduit
12. 650 13.2kV Substation

1.6 APPLICATION FOR PAYMENT

A. General:
   1. Progress payments applications will be made monthly on the date established at the preconstruction meeting.

B. Pay Applications shall be submitted in eBuilder®. Pencil copy shall be submitted to the CM for review prior to submission of progress Pay Application. Pencil copy shall be submitted on form provided by the CM.

C. Payment for all work shown or specified in the Contract Documents is included in the Contract Price. No measurement or payment will be made for individual items.

   1. General:
      a. The lump sum bid price for this work will consist of work identified in the Contract Documents associated with construction of the Wet Weather Pump Station.
      b. Major items of work are provided in Section 01 11 00, Summary of Work, Paragraph 1.02.B.
      c. Measurement and payment for this item will be a physical percent complete as agreed upon by the Construction Manager and the Contractor per the Contractor's Schedule of Values.

   2. Electrical:
      a. The lump sum bid price for this work will consist of work identified in the Contract Documents associated with construction of the Wet Weather Pump Station.
      b. Major items of work are provided in Section 01 11 00, Summary of Work, Paragraph 1.02.C
      c. Measurement and payment for this item will be a physical percent complete as agreed upon by the Construction Manager and the Contractor per the Contractor's Schedule of Values.

   3. HVAC:
      a. The lump sum bid price for this work will consist of work identified in the Contract Documents associated with construction of the Wet Weather Pump Station.
      b. Major items of work are provided in Section 01 11 00, Summary of Work, Paragraph 1.02.D.
      c. Measurement and payment for this item will be a physical percent complete as agreed upon by the Construction Manager and the Contractor per the Contractor's Schedule of Values.

   4. Plumbing:
      a. The lump sum bid price for this work will consist of work identified in the Contract Documents associated with construction of the Wet Weather Pump Station.
      b. Major items of work are provided in Section 01 11 00, Summary of Work, Paragraph 1.02.E
      c. Measurement and payment for this item will be a physical percent complete as agreed upon by the Construction Manager and the Contractor per the Contractor's Schedule of Values.

1.7 NON-PAYMENT FOR REJECTED OR UNUSED PRODUCTS

A. Payment will not be made for following:
   1. Loading, hauling, and disposing of rejected material.
   2. Quantities of material wasted or disposed of in manner not called for under Contract Documents.
   3. Rejected loads of material, including material rejected after it has been placed by reason of failure of Contractor to conform to provisions of Contract Documents.
   4. Material not unloaded from transporting vehicle.
   5. Defective work not accepted by Owner.
   6. Material remaining on hand after completion of work.

1.8 PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT

A. Partial Payment:
   1. No partial payments will be made for materials and equipment delivered or stored unless Shop Drawings or preliminary operation and maintenance manuals are acceptable to Construction Manager.

B. Final Payment:
   1. Final payment shall not be made for material and equipment incorporated in work unless all deliverables required in Sections 01 33 04, Operation and Maintenance Manuals; 01 75 00, Facility Startup, through 01 78 39, Contract Closeout and Execution Documents; and Article 3 of the General Contract Conditions are submitted and approved.

C. Temporary Systems
   1. No payment will be made for stored materials and equipment that are not part of the permanent Work.

1.9 PARTIAL PAYMENT FOR UNDELIVERED, PROJECT-SPECIFIC MANUFACTURED OR FABRICATED EQUIPMENT

A. Notwithstanding the above provisions, partial payments for undelivered (not yet delivered to site or not stored in the vicinity of site) products specifically manufactured for this Project, excluding off the shelf or catalog items, may be made for products listed below when all following conditions exist:
   1. Partial payment request is supported by written acknowledgment from Supplier(s) that invoice requirements have been met.
   2. Equipment is adequately insured, maintained, stored at a location acceptable to the Owner, protected by appropriate security measures, and verification of same is provided to the Owner.
   3. Each equipment item is clearly marked and segregated from other items to permit inventory and accountability.
   4. Authorization has been provided for access to storage site for Construction Manager and Owner. All costs related to inspections shall be at the Contractor’s expense.
   5. Equipment meets applicable specifications of these Contract Documents.

B. Payment of 15% of manufacturer's quoted price for undelivered, Project specific manufactured equipment will be made following shop drawing approval. Thereafter, monthly payments will be made based on progress of fabrication as determined by Construction Manager, but in no case will total of payments prior to delivery exceed 75% of manufacturer's quoted price. This amount shall be identified in the Schedule of Values.

C. Failure of Contractor to continue compliance with above requirements shall give cause for Owner to withhold payments made for such equipment from future partial payments.

D. Failure of Contractor to supply Operation and Maintenance Manuals will cause the Owner to withhold payment in the amount of 0.025% or $2,500, whichever is greater. Failure of Contractor to supply as-built drawings will cause the Owner to withhold payment in the amount of 0.05% or $5,000, whichever is greater.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION

3.1 PAY ITEMS

A. Pay Item 1 – WWPS Construction Lump Sum Work
   1. The lump sum bid price for this work includes work identified in the Contract Documents and as summarized in Section 01 11 00, Summary of Work.
   2. Work associated with unit price and allowance items as identified in this Section will not be paid under this pay item.
   3. Measurement and payment for this item will be a physical percent complete as agreed by the Construction Manager and Contractor per the Contractor's Schedule of Values.
   4. Payment for this pay item will be made at the lump sum bid price, which will include all labor, materials, equipment, tools, testing, fees, and incidentals needed to complete the work specified, except as otherwise itemized in the Schedule of Values.
   5. All mechanical, civil, architectural, and structural improvements performed as part of this project is considered part of this lump sum bid price.
   6. All temporary support of excavation (SOE) systems and rock initial support are considered part of this lump sum bid price.
   7. Temporary Water Control
      a. All regulatory testing and treatment of all fluid discharged from temporary water control systems as described in Section 31 23 19, to control construction water and groundwater to meet applicable regulatory requirements is considered part of this lump sum bid price.
      b. Furnishing, delivery, installation, maintenance, operation, monitoring and removal of all temporary water control systems to control groundwater and construction water is considered part of this lump sum bid price.
      c. Coordination with Construction Manager who may observe the regulatory testing performed by Contractor.
   8. Regulatory Testing – subsurface work
      a. All sampling, testing and analysis of all excavated materials for compliance with applicable regulatory requirements including but not limited to soil, rock and other encountered material during subsurface work, pile drilling, temporary SOE work, grout hole drilling, probe hole drilling, spoils, handling, hauling and disposal.
      b. Coordination with Construction Manager who may observe the regulatory testing performed by Contractor.
   9. Excavation, handling, stockpiling, hauling and disposal – Soil and Other Encountered Material
      a. Beyond the circumference of the outer diameter of the shaft slurry wall and below grade, all excavation, handling, stockpiling, hauling and disposal of soil, rock, spoils and other encountered material during subsurface work is considered part of this lump sum bid price.

i. All material shall be assumed to be Residual Waste as described in Section 31 23 00.

b. Within the circumference of the outer diameter of the guidewalls, shaft slurry wall and below grade, all excavation, handling, stockpiling, hauling and disposal of soil and other encountered material during subsurface work, is considered part of this lump sum bid price.
   i. All material above approximate elevation 693 shall be assumed to be Residual Waste as described in Section 31 23 00.
   ii. All material below approximate elevation 693 to the top of rock interface shown in the GBR shall be assumed to be Clean Fill as described in Section 31 23 00.

c. If regulatory compliance testing confirms Residual Waste material in excess of the above assumptions, refer to Pay Item 22 – Additional Residual Waste Soil Disposal for payment.

10. Excavation, handling, stockpiling, hauling and disposal – Rock and Other Encountered Material
    a. Within the circumference of the outer diameter of the slurry wall and below including the shaft and the tunnel junction chamber, all excavation, handling, stockpiling hauling and disposal of rock and other encountered material below the soil interface is considered part of this lump sum bid price. Disposal of rock that is not identified as Acid Producing Rock per item b. below is considered part of this lump sum bid price.
    b. If regulatory compliance testing in accordance with PennDOT Publication 293, Chapter 10 confirms Acid Producing Rock l refer to Pay Item 23 –Acid Producing Rock Disposal for payment.

B. Pay Item 2 – Drilled Micropiles
   1. This pay item will be measured in VLF.
   2. Measurement is from the micropile tip elevation (bottom of the bonded zone) to the final cutoff elevation (top of the casing).
   3. Payment for this pay item will be made at a unit price, which bid price and payment will include all costs for furnishing all labor, materials, equipment, and accessories required for complete micropile installation as indicated in the Contract Documents.
   4. Payment for the required proof load tests shall be incorporated into the micropile unit price VLF.
   5. Payment for installed micropile length to be made in accordance with unit prices in the Bid Proposal.
      a. No payment will be made for individual micropiles but will be made on the total lineal footage of piling installed.
      b. No price adjustment will be made for grout volume, unless greater than twice the theoretical total volume of the holes for all accepted production piles. Adjustment shall only be made on the labor and materials associated with the grout.
   6. Payment will be made for micropiles that do not achieve the required tip elevation and are discontinued due to encountering an obstruction and for any additional piles required at locations of discontinued piles.
   7. No payment will be made for the following:
      a. Grout volume less than twice the total of theoretical volume of all accepted production piles.
      b. Damaged, failed, or rejected piles or for the installation of piles and additional foundation construction resulting from the damaged or rejected piles
      c. Additional pile and concrete construction required when a proof load test pile fails

at a location where the test pile is required for support of the structure.
   d. Piles installed beyond specified tolerance limits and piles and concrete foundation construction required due to piles installed beyond the tolerance limits.
   e. Pile lengths extending beyond cut-off elevation.
   f. Piles installed as sacrificial reaction piles for the purposes of testing described in Pay Item 4, unless production piles are used in lieu of sacrificial reaction piles.

C. Pay Item 3 – Static Compression and Tension Verification Pile Load Tests
   1. This pay item will be measured per EA.
   2. Payment for this pay item will be made at a unit price, which bid price and payment will include all costs for furnishing all labor, materials, and accessories required for pile load testing at piles as indicated in the Contract Documents.
   3. Payment will include costs associated with verification load testing and integrity testing and reporting as specified in Section 31 63 33, Drilled Micropiles.
   4. Production piles may be used as reaction piles for Verification Pile Load Tests. If used, as reaction piles, payment for production piles will be made separately under Pay Item 3.
   5. No payment will be made for the following:
      a. Pile load test where either the testing system, test pile, or reaction (anchor) pile fails before test is complete.
      b. Additional pile and concrete construction required when a test pile fails at a location where the test pile is required for support of the structure.

D. Pay Item 4 – Pre-excavation Grout Hole Drilling in Soil
   1. This pay item will be measured per LF.
   2. Payment for this pay item will be made at a unit price, which bid price and payment will include all costs for furnishing all labor, materials, and equipment required to complete drilling of pre-excavation grout holes in soil, including mobilization, casing, and soil drilling.

E. Pay Item 5 – Pre-excavation Grout Hole Drilling in Rock
   1. This pay item will be measured per LF.
   2. Payment for this pay item will be made at a unit price, which bid price and payment will include all costs for furnishing all labor, materials, and equipment required to complete drilling of pre-excavation grout holes in rock, including mobilization and rock drilling.

F. Pay Item 6 – Probe Hole Drilling in Rock
   1. This pay item will be measured per LF.
   2. Payment for this pay item will be made at a unit price, which bid price and payment will include all costs for furnishing all labor, materials, and equipment required to complete drilling of probe grout holes, including mobilization and rock drilling.

G. Pay Item 7 – Shaft Pre-Excavation Grouting Exclusive of Grout Materials
   1. This pay item will include full compensation for labor and equipment for shaft pre-excavation grouting as specified and shown on the Contract Drawings, including:
      a. Labor performing the grouting and support services for grouting.
      b. Provision of all grouting equipment, connections, piping, and consumables other than those specifically excluded in this Part.
      a. Any indirect costs associated with any extension of Contract Time due to the performance of grouting.
      c. All other work required to provide the Shaft Pre-Excavation Grouting Exclusion of Grout Materials in accordance with the Contract Documents and drilling of pre-

excavation grouting per additional Pay Items.

ADD NO. 6

2. Grout material is excluded from this pay item and paid under SPECIFIC ALLOWANCE #13, "Grout Materials Used for Pre-Excavation Grouting and Cut-off Grouting."
3. Disposal of grout waste is incidental to this Bid Item.
4. This pay item will be measured per crew hour as provided below:
   a. The hourly measurement will be for crew hours only performing grouting operations under this task. The hourly measurement will be for actual hours grouting, which is determined by water pressure testing performed in accordance with the specifications. A crew hour encompasses all resources combined for one hour of grouting performed at a single grout hole.
   b. If grouting is performed concurrently at multiple grout holes, measurement of crew hour will be by each grout crew carrying out grouting activities as provided under this pay item.
   c. Attempts to grout where no grout takes, or limited grout takes will still be considered time grouting if executed in good faith and with concurrence of the Owner.
   d. Contractor should anticipate items such as mobilization of specialty Subcontractor(s), water pressure testing of grout holes, batching and filling of grout lines, moving from hole to hole, set-up and break-down, quality control testing, preparation of grouting records and submittals, Contractor and Subcontractor field oversight, and other items for inclusion into the hourly rate bid.
5. No payment will be made for stoppages that result from equipment failure or breakdown, time spent troubleshooting and repairing failed or faulty equipment, replacing or cleaning seized grout lines, stoppages and downtime due to inaccessible or unavailable grout holes, standby time due to material or equipment delivery delays, and other non-productive time spent in support of grouting activity.

H. Pay Item 8 – Cut-off Grouting Exclusive of Grout Materials
1. This pay item will include full compensation for labor equipment for shaft pre-excavation grouting as specified and shown on the Contract Drawings, including:
   a. Labor performing the grouting and support services for grouting.
   b. Provision of all grouting equipment, connections, piping, and consumables other than those specifically excluded in this Part.
   c. Any indirect costs associated with any extension of Contract Time due to the performance of grouting.
   d. All other work required to provide the Cut-off Grouting Exclusion of Grout Materials in accordance with the Contract Documents and drilling of the probe hole drilling per additional Pay Items.

ADD NO. 6

2. Grout material is excluded from this pay item and paid under SPECIFIC ALLOWANCE #13, "Grout Materials Used for Pre-Excavation Grouting and Cut-off Grouting."
3. Disposal of grout waste is incidental to this Bid Item.
4. This pay item will be measured per crew hour as provided below:
   a. The hourly measurement will be for crew hours only performing grouting operations under this task. The hourly measurement will be for actual hours grouting, which is determined by water pressure testing performed in accordance with the specifications. A crew hour encompasses all resources combined for one hour of grouting performed at a single grout hole.
   b. If grouting is performed concurrently at multiple grout holes, measurement of crew hour will be by each grout crew carrying out grouting activities as provided under this pay item.
   c. Attempts to grout where no grout takes, or limited grout takes will still be

considered time grouting if executed in good faith and with concurrent of the Owner.

d. `Contractor should anticipate items such as mobilization of specialty Subcontractor(s), water pressure testing of grout holes, batching and filling of grout lines, moving from hole to hole, set-up and break-down, quality control testing, preparation of grouting records and submittals, Contractor and Subcontractor field oversight, and other items for inclusion into the hourly rate bid.

5. No payment will be made for stoppages that result from equipment failure or breakdown, time spent troubleshooting and repairing failed or faulty equipment, replacing or cleaning seized grout lines, stoppages and crew downtime due to inaccessible or unavailable grout holes, standby time due to material or equipment delivery delays, and other non-productive time spent in support of grouting activity.

I. Pay Item 9 – Initial Support Spot Rock Dowels
   1. This pay item will be measured per LF.
   2. Payment for this pay item will be made at a unit price, which bid price and payment will include all costs for furnishing all labor, materials, and equipment required for installation of spot rock dowels.

J. Pay Item 10 – Alternative 1 Connection to ORT Contract Dewatering Tunnel
   1. This pay item will be measured in LS.
   2. The lump sum bid price for this work will consist of work identified in the Contract Documents associated with construction of Alternative 1 of the interface with the ORT Contract.
   3. Major items of work include initial support, shotcrete, removal of CLSM, temporary bulkhead installed by ORT Contract 1797, construction of the permanent concrete of the DWT, and constructing the final permanent connection of the DWT installed in the ORT Concrete.
   4. Selection of Alternative 1 or 2 will be coordinated by the Construction Manager and Contractor and will depend on construction schedule and progress of both the WWPS Contract 1800 and ORT Contract 1797. A decision will be made by the Owner 90 days prior to Work associated with the Alternatives defined in the Contract Drawings. Contractor shall include the longer duration Alternative within the Baseline Schedule.
   5. Contractor will only be paid for one alternative.

K. Pay Item 11 – Alternative 2 Connection to ORT Contract Dewatering Tunnel
   1. This pay item will be measured in LS.
   2. The lump sum bid price for this work will consist of work identified in the Contract Documents associated with construction of Alternative 2 of the interface with the ORT Contract.
   3. Major items of work include initial support, construction of permanent DWT to limits shown, design and installation of temporary bulkhead, and installation of CLSM required to facilitate the permanent connection of the future ORT Contract to the WWPS contract.
   4. Selection of Alternative 1 or 2 will be coordinated by the Construction Manager and Contractor and will depend on construction schedule and progress of both the WWPS Contract 1800 and ORT Contract 1797. A decision will be made by the Owner 90 days prior to Work associated with the Alternatives defined in the Contract Drawings. Contractor shall include the longer duration Alternative within the Baseline Schedule.
   5. Contractor will only be paid for one alternative.

L. Pay Item 12 – Specific Allowance #1 – Dispute Review Board (DRB)

1. The amount stipulated for this Allowance item shall be used to reimburse the Contractor for the Owner's portion of the cost incurred in accordance with the terms and conditions of the Contract and the Dispute Review Board (DRB) Agreement.
2. The Contractor shall be responsible for the initial payment of all DRB related costs and submit the proper documentation within 30 days of invoice date to receive reimbursement for 50% of the costs from the Owner under work order authorizations from this Allowance. The remaining 50% shall be unreimbursed and therefore paid by the Contractor. No markup shall be added for services provided under this item and any unused portion shall be deducted at the end of the Contract.
3. If the DRB requests specialty items, services, or personnel, both the Contractor and Owner shall be made aware of these requests prior to expenditures and agree to split the cost of such items.

M. Pay Item 13 – Specific Allowance #2 – Stoppage to Slurry Wall Trench Excavations
1. A stoppage is defined as an obstruction within the slurry wall panel excavation that reduces the excavation rate to less than 6 vertical inches over a 4-hour period and requires the employment of special tools and/or excavation techniques and procedures, including drilling, excavating, or coring, to remove, break up or push aside the obstruction.
2. Payment for this pay item will be measured per crew hour as provided below:,
   a. The hourly measurement will be for crew hours only performing operations for drilling, excavating, coring through, breaking up, pushing aside, or otherwise removing the obstruction found during installation of the slurry wall. A crew hour encompasses all resources combined for one hour.
3. Payment to include reimbursement for indirect costs due to Contract Time extensions and/or critical path delays incurred as a result of drilling through obstructions, as determined by the Owner.
4. No payment will be made under this item for the following:
   b. Near-surface stoppages encountered during guide wall installation.
   c. Stoppages less than 10 ft below the existing ground surface.
   d. Obstructions which take less than 4 hours to drill, excavate, core through, break up, push aside, or otherwise remove, measured from the moment an obstruction is confirmed as specified.
   e. Concrete from the nearby Primary Panel that is being excavated for a Secondary Panel.
   f. Obstructions encountered in mass excavations of the shaft.

N. Pay Item 14 – Specific Allowance #3 – Drilling Through Obstructions for Micropile Installation
1. Obstructions for Micropile Installation are defined in the Contract Documents as natural or manmade objects that are encountered within the site overburden (Fill and Alluvium) soils which stop drilling progress of a micropile for more than 2 hours despite the Contractor's reasonable and diligent effort to overcome it, as determined by the Owner.
2. This pay item will be measured per crew hour as provided below:
   a. The hourly measurement will be for actual hours expended to remove or otherwise advance micropiles through obstructions as defined above, which takes more than 2 hours to clear during drilling. For each micropile, clearing of obstructions by the Contractor that does not significantly impact drilling progress, and takes less than 2 hours to break apart, clear, and/or remove, is incidental to the Work and will not be paid separately. Payment to include reimbursement for indirect costs due to

Contract Time extensions and/or critical path delays incurred as a result of drilling through obstructions, as determined by the Owner.

3. Payment will be made for obstruction removal time at each micropile in excess of 2 hours.

O. Pay Item 15 – Specific Allowance #4 – Disposal of Other Contaminated Waste
   1. Allowance for potential force account work identified in Section 31 23 00, Management, Handling, and Disposal of Excavated Soil and Other Excavated Material, Paragraphs 1.03.I, 1.05.C.1.c, 3.05B.3, 3.06D, and 3.07A.
   2. Payment for this pay item will be made as an allowance, per Article 1.4 above which total bid price is set and provided in the Contract Documents. Payment will include all costs for furnishing all labor, materials, and equipment required for proper sampling, testing, handling, removal, and disposal of other contaminated waste, that is discovered due to work outside the Lump Sum, Unit Price and Allowance Work Items. Other contaminated waste is defined in Section 31 23 00, Management, Handling, and Disposal of Excavated Soil and Other Excavated Material.
   3. Payment will be made for time and materials required to handle, segregate, remove, and properly dispose of other contaminated wastes due to additional work approved by the Owner in writing.
   4. No payment will be made for the following:
      a. Any handling, removal, or disposal of other contaminated waste due to work that has not been approved in writing by Owner, prior to work commencement.

P. Pay Item 16 – Specific Allowance #5 – Non-Compliant Groundwater Disposal
   1. Allowance for potential force account work, as identified in Section 31 21 00**,** Earthwork, Excavation, Trenching and Backfilling, Paragraph 1.07D**;** and 31 23 00**,** Management, Handling, and Disposal of Excavated Soil and Other Excavated Material, Paragraph 1.05.C.

ADD NO. 6

   2. Payment for this pay item will be made as an allowance, per Article 1.4 above, which total bid price is set and provided in the Contract Documents. Payment will include all costs for furnishing all labor, materials, and equipment required for proper sampling, testing, handling, removal, and disposal of non-compliant groundwater encountered during excavation activities.
   3. Payment will be made for time and materials required to handle, remove, and properly dispose of non-compliant groundwater.
   4. No payment will be made for the following:
      a. Any handling, removal, or disposal of compliant groundwater, or non-compliant groundwater due to work not included in the Lump Sum Bid items or that has not been approved in writing by Owner, prior to work commencement.

Q. Pay Item 17 – Specific Allowance #6 – Handling and Disposal of Lead-Based Coatings and Asbestos-Containing Materials (ACM) (Greater Than 1 Percent Asbestos)
   1. Payment for this pay item will be made as an allowance, per Article 1.4 above, which total bid price is set and provided in the Contract Documents. Payment will include all costs for furnishing all labor, materials, and equipment required for proper testing, handling, removal, and disposal of hazardous materials encountered during project work. Hazardous materials are required to be removed if work requires the demolition, disturbance, relocation, or modification of equipment or structures.
   2. Hazardous materials include:
      a. Lead-based paint on structures and/or equipment.
      b. ACM (defined as containing greater than 1 percent asbestos) including, but not

limited to, electrical wiring/materials, pipe materials, masonry materials, and insulation materials.

3. Contractor shall submit for identification testing of any material suspected or with the potential to be hazardous as directed by Owner.
4. Payment will be made by tracking of for time and materials required to test, handle, remove, and properly dispose of hazardous materials.
5. No payment will be made for the following:
   a. Any handling, removal, or disposal of hazardous materials due to work not included in the Lump Sum Bid items or that has not been approved in writing by Owner, prior to work commencement.

R. Pay Item 18 – Excavation of "Hard Slag" Removal

ADD NO. 6

1. This pay item will be measured per CY.
2. Payment for this pay item will be made as an allowance, per Article 1.4 above, which total bid price is set and provided in the Contract Documents. Payment for this pay item will be made at a unit price, which bid price and payment will include all costs for furnishing all labor, materials, and equipment required for excavation, handling, removal and disposal of hard slag found outside the limits of the WWPS slurry wall, including hard slag encountered during installation of piping, structures, or temporary earth retaining structures that cannot be removed utilizing conventional excavation equipment and methods.
3. Payment for excavation and removal of hard slag within pre-trenching excavations for the WWPS slurry walls, encountered within 10 feet of the ground surface shall be paid under this pay item.
4. Slag (sometimes called "blue slag" due to its color and hardness) was commonly used on the ALCOSAN plant site for roadway and structural foundation material at a typical thickness of 12-inches to 18-inches.
5. Excavation of slag shall be considered to be part of the Lump Sum Pay Item 1 WWPS Construction Lump Sum Work if it can be removed with the use of excavation equipment including but not limited to backhoes, bulldozers, or scrapers.
6. Should removal require the use of jackhammers, or pavement breakers, the Contractor shall be reimbursed by the Contract Unit Price per cubic yard under this Pay Item.
7. Excavated material shall be considered Residual Waste.
8. Payment will be made for excavations completed with written authorization by the Owner.
9. No payment will be made for the following:
   a. Work by the Contractor without prior written authorization from the Owner.
   b. Removal of hard slag material utilizing conventional excavation equipment described above.
   c. Removal of hard slag material encountered within the mass excavation for the WWPS.

S. Pay Item 19 – Specific Allowance #8 – Excavation and Demolition Of Unforeseen Concrete, Masonry and Other Manmade Obstructions

ADD NO. 6

1. Payment for this pay item will be made as an allowance, per Article 1.4 above, which total bid price is set and provided in the Contract Documents. Payment will include all costs for furnishing all labor, materials, and equipment required for excavation, demolition, handling, and disposal of manmade obstructions found outside the limits of the WWPS slurry wall, including manmade obstructions encountered during installation of piping, structures, or temporary earth retaining structures.

2. Payment for excavation and removal of unforeseen concrete, masonry and other manmade obstructions within pre-trenching excavations for the WWPS slurry walls, encountered within 10 feet of the ground surface shall be paid under this pay item.
3. Excavations may uncover unforeseen quantities of concrete, masonry and other manmade structures below grade. Removal of the unforeseen concrete and masonry structures will be considered to be part of the Lump Sum Pay Item 1 WWPS Construction Lump Sum Work if they can be removed with the use of excavating equipment including but not limited to backhoes, bulldozers, or scrapers.
4. Should removal require demolition of the concrete and masonry structures by the use of jackhammers, or pavement breakers, then the Contractor shall be reimbursed by the Contract Unit Price per Cubic Yard under this Pay Item.
5. Concrete, masonry and other manmade obstructions shall be considered Residual Waste.
6. Payment will be made for excavations completed with written authorization by the Owner.
7. No payment will be made for the following:
    a. Work by the Contractor without prior written authorization from the Owner.
    b. Excavation and demolition of buried concrete, masonry and other manmade structures specifically identified in the Contract Documents.
    c. Excavation and demolition of buried concrete, masonry and other manmade structures encountered within the mass excavation for the WWPS.
    d. Obstructions defined in other Pay Items.

T. Pay Item 20 – Specific Allowance #9 – Contingent Unclassified Excavation
1. Payment for this pay item will be made as an allowance, per Article 1.4 above, which total bid price is set and provided in the Contract Documents. Payment will include all costs for furnishing all labor, materials, and equipment required for excavation, handling, and disposal of excavated material outside the scope of work included in the Contract Documents as requested by the Owner.
2. Excavated material shall be considered Residual Waste.
3. Payment will be made for excavations completed with written authorization by the Owner.
4. No payment will be made for the following:
    a. Work by the Contractor without prior written authorization from the Owner.
    b. Excavations made by the Contractor without prior written authorization from the Owner.

U. Pay Item 21 – Specific Allowance #10 – Contingent Placement of Backfill Material
1. Payment for this pay item will be made as an allowance, per Article 1.4 above, which total bid price is set and provided in the Contract Documents. Payment will include all costs for furnishing all labor, materials, and equipment required for placement and compaction of permanent backfill material in place completed as part of Pay Item 19 and Pay Item 20.

V. Pay Item 22 – Specific Allowance #11 – Additional Residual Waste Soil Disposal
1. Allowance for potential force account work identified in Section 31 23 00, Management, Handling, and Disposal of Excavated Soil and Other Excavated Material, Paragraphs 1.05C.1.b, 3.05B.3, 3.06C, and 3.07A.
2. Payment for this pay item will be made as an allowance, per Article 1.4 above which total bid price is set and provided in the Contract Documents. Payment will include all costs for furnishing all labor, materials, and equipment required for proper disposal of

Residual Waste Soil, that is discovered due to work outside the Lump Sum Work Items. Residual Waste is defined in Section 31 23 00, Management, Handling, and Disposal of Excavated Soil and Other Excavated Material.

3. Payment will be made due to additional work approved by the Owner in writing.
4. No payment will be made for the following:
   a. Any handling, removal, or disposal of Residual Waste due to work that has not been approved in writing by Owner, prior to work commencement.
   b. Handling, removal, or disposal of Residual Waste to the extents provided in Paragraph 3.1B.9 herein.
5. This pay item will be measured per ton, based upon submitted truck weigh tickets.

W. Pay Item 23 – Specific Allowance #12 – Acid Producing Rock Disposal

ADD NO. 6

1. Allowance for potential force account work identified in Section 31 23 00, Management, Handling, and Disposal of Excavated Soil and Other Excavated Material, Paragraphs 1.05.C.1.b, 3.05B.3, 3.06C, and 3.07A.
2. Payment for this pay item will be made as an allowance, per Article 1.4 above which total bid price is set and provided in the Contract Documents. Payment will include all costs for furnishing all labor, materials, and equipment required for proper disposal of Acid Producing Rock as a Residual Waste that may be encountered within the limits identified in the GBR.
3. Residual Waste is defined in Section 31 23 00, Management, Handling, and Disposal of Excavated Soil and Other Excavated Material.
4. Payment will be made due to additional work approved by the Owner in writing.
5. No payment will be made for the following:
   a. Any handling, removal, or disposal of Residual Waste due to work that has not been approved in writing by Owner, prior to work commencement.
6. This pay item will be measured per ton based on submitted truck weigh tickets.

X. Pay Item 24 – Specific Allowance #13 – Grout Materials Used for Pre-Excavation Grouting and Cut-off Grouting

1. Allowance for compensation to the Contractor for grout material used in the pre-excavation grouting of shafts and cut-off grouting.
2. Different grout materials will need to be used at different times and for different applications. It is expected that the Contractor will work closely with the Owner to determine the effectiveness of the grout material used and change it if not effectively cutting off groundwater. This will require trial and error or mixes and types of grouts. This BID ITEM is for the material cost for the grout type used only.

ADD NO. 6

3. Measurement for this item will be as agreed between the Contractor and Owner during construction and in consideration of various grout types. Payment for this BID ITEM will be on an 'at cost' open-book invoiced basis including mark up and profit allowed by the Contract.

G. Pay Item 25 – Specific Allowance #14 – Unforeseen Utility Removal and Relocation

1. Payment for this pay item will be made as an allowance, per Article 1.4 above, which total bid price is set and provided in the Contract Documents. Payment will include all costs for furnishing all labor, materials, and equipment required for unforeseen utility removal and relocation that is required to complete the Work.
2. Utilities may include but not be limited to various active and inactive process piping systems, potable water, nonpotable water, stormwater, drains, electrical, fiberoptic, gas systems.
3. Excavated material shall be considered Residual Waste.

4. No payment will be made for the following:
    a. Work conducted by the Contractor without prior written authorization from the Owner.

3.2 ELECTRICAL CONSTRUCTION CONTRACT

A. Lump Sum:
    1. This pay item will not be measured for payment.
    2. Payment for this pay item will be made at the lump sum bid price, which price and payment will include all labor, materials, equipment, tools, testing, fees, and incidentals needed to complete the work specified, except as otherwise itemized in the Schedule of Values.
    3. All electrical improvements performed as part of this project is considered part of this lump sum bid price.

3.3 HVAC CONSTRUCTION CONTRACT

A. Lump Sum:
    1. This pay item will not be measured for payment.
    2. Payment for this pay item will be made at the lump sum bid price, which price and payment will include all labor, materials, equipment, tools, testing, fees, and incidentals needed to complete the work specified, except as otherwise itemized in the Schedule of Values.
    3. All HVAC improvements performed as part of this project is considered part of this lump sum bid price.

3.4 PLUMBING CONSTRUCTION CONTRACT

A. Lump Sum:
    1. This pay item will not be measured for payment.
    2. Payment for this pay item will be made at the lump sum bid price, which price and payment will include all labor, materials, equipment, tools, testing, fees, and incidentals needed to complete the work specified, except as otherwise itemized in the Schedule of Values.

3.5 All plumbing improvements performed as part of this project is considered part of this lump sum bid price.

3.6 INITIAL APPLICATION FOR PAYMENT

A. Administrative actions and submittals that must precede the first Application for Payment include the following:
    1. Contractor's Mobilization Schedule (first 90 days).
    2. Baseline Construction Schedules information.
    3. Contractor's Schedule of Values.
    4. Contractor's Submittal Schedule.
    5. List of Subcontractors (if required).
    6. List of Principal Suppliers and Fabricators (if required).
    7. List of Contractor's staff assignments (if required).
    8. Copies of Building Permits (if applicable).
    9. Copies of licenses and authorizations from governing authorities for performance of the work (if applicable).
    10. Certificates of Insurance.
    11. Required Bonds.

12. Safety Program reviewed by the ALCOSAN and Construction Manager and recorded as reviewed without comments.
13. WBE/MBE submittal accepted.
14. Preconstruction photograph and video session completed and three copies provided to the Construction Manager.

3.7 MONTHLY APPLICATION FOR PAYMENT

A. Administrative actions and submittals that must precede each monthly Application for Payment include the following:
   1. Contractor's Project Schedule with brief summary narrative (updated).
   2. Contractor's submittal schedule (updated).
   3. Certified payrolls.
   4. Certificates of Insurance (updated).
   5. Required backup/approved shop drawings for materials stored on site.
   6. Maintenance of on-site as-built drawings.
   7. Resolution of all Site Safety Notices.
   8. Disposition of all Non-Conformance Notices by the Construction Manager.
   9. WBE/MBE compliance update.
   10. Weekly safety meeting minutes.

3.8 INITIAL APPLICATION FOR PAYMENT

A. Administrative actions and submittals that must precede the first Application for Payment include the following:
   1. Contractor's Mobilization Schedule (first 90 days).
   2. Baseline Construction Schedules information.
   3. Contractor's Schedule of Values.
   4. Contractor's Submittal Schedule.
   5. List of Subcontractors (if required).
   6. List of Principal Suppliers and Fabricators (if required).
   7. List of Contractor's staff assignments (if required).
   8. Copies of Building Permits (if applicable).
   9. Copies of licenses and authorizations from governing authorities for performance of the work (if applicable).
   10. Certificates of Insurance.
   11. Required Bonds.
   12. Safety Program reviewed by the ALCOSAN and Construction Manager and recorded as reviewed without comments.
   13. WBE/MBE submittal accepted.
   14. Preconstruction photograph and video session completed and three copies provided to the Construction Manager.

3.9 MONTHLY APPLICATION FOR PAYMENT

A. Administrative actions and submittals that must precede each monthly Application for Payment include the following:
   11. Contractor's Project Schedule with brief summary narrative (updated).
   12. Contractor's submittal schedule (updated).
   13. Certified payrolls.
   14. Certificates of Insurance (updated).
   15. Required backup/approved shop drawings for materials stored on site.
   16. Maintenance of on-site as-built drawings.

17. Resolution of all Site Safety Notices.
18. Disposition of all Non-Conformance Notices by the Construction Manager.
19. WBE/MBE compliance update.
20. Weekly safety meeting minutes.

3.10 FINAL APPLICATION FOR PAYMENT

A. Administrative actions and submittals that must precede the Final Application for Payment are outlined in Article 3, General Contract Conditions.

END OF SECTION

SECTION 31 71 16
BLASTING, VIBRATION, AND NOISE CONTROL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Section includes requirements for blasting for construction of the shaft and tunnel junction chamber.

B. Means and methods of excavation shall be compatible with the requirements for controlled blasting techniques and for the shaft and tunnel junction chamber ground support types, as indicated in the Contract Documents. Blasting design shall seek to utilize and preserve the inherent strength of the rock mass surrounding the shaft and tunnel junction chamber.

C. Controlled blasting is specified as described in this Section.

D. Coordinate the blasting in the shafts and tunnels with other underground aspects and regulations.

E. Coordinate with Owner and Sherwin Williams as discussed herein prior to blasting operations and notify for any delays.

F. Monitoring of ground vibrations and air-overpressure levels originating from all blasting and other vibration and impulsive-noise producing construction operations.

1.02 RELATED SECTIONS

A. This section contains specific references to the following related sections. Additional related sections also apply that are not specifically listed below.
   1. Section 01 33 00 Submittals.
   2. Section 31 09 13 Geotechnical Instrumentation and Monitoring.
   3. Section 31 23 00 Management, Handling, and Disposal of Excavated Soil and other Excavated Material.
   4. Section 31 23 19 Control of Groundwater and Construction Water.
   5. Section 31 23 20 Pre-Excavation Drilling and Grouting.
   6. Section 31 56 00 Slurry Walls.
   7. Section 31 71 21 Rock Excavation.
   8. Section 31 72 13 Rock Initial Support.
   9. Section 31 75 00 Shaft Construction.

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.

Reference	Title
Allegheny County	Local requirements and regulations.
Bureau of Alcohol, Tobacco, and Firearms and Explosives (ATF)	Federal Explosives Law and Regulation, 2012
CFR	CFR Title 27, Part 70, Procedure and Administration.
	CFR Title 27, Part 555, Commerce in Explosives.
	CFR Title 29, Part 1910, Occupational Safety and Health Standards.
	CFR Title 29, Part 1926, Subpart U: Safety and Health Regulations for Construction, Blasting.
	CFR Title 49, Part 177, Carriage by Public Highway.
City of Pittsburgh Bureau of Fire	Bureau of Fire regulations and requirements for blasting within the City Limits.
Institute of Manufacturers of Explosives	Do's and Don'ts - Instructions and Warnings for Consumers in Transporting, Storing, Handling, and Using Explosive Materials.
	Destruction of Commercial Explosives.
	Suggested Code of Regulations for the Manufacture, Transportation, Storage, Sale, Possession and Use of Explosive Materials.
	Safety in the Transportation, Storage, Handling and Use of Explosive Materials.
International Society of Explosive Engineers (ISEE)	Blast monitoring equipment operation standards (1999).
International Fire Code (IFC)	Chapter 56 requirements for storage, transportation, and use of explosives in the City of Pittsburgh.
McKees Rock Borough	Local requirements and regulations.

Reference	Title
National Fire Protection Association (NFPA)	NFPA 495 - Code for the Manufacture, Transportation, Storage and Use of Explosive Materials, 1985 Edition.
Commonwealth of Pennsylvania Code (PA Code)	Title 25 Chapter 211. Storage, Handling and Use of Explosives, including all References.
	Title 25 Chapter 210. Blaster's Licenses
UFC	Uniform Fire Code (UFC), Article 77, Explosives Materials
US Dept of Interior, OSHA	Bureau of Reclamation. Construction Safety Standards, Section 24. 2002.
	Construction Standards and Interpretations 29 CFR Part 1926, Subpart U, Section 1926.900, "Blasting and Use of Explosives", final rule dated December 16, 1972.
United States Bureau of Mines	Report of Investigations 8507: Structure Response and Damage Produced by Ground Vibration from Surface Mine Blasting.

1.03 DEFINITIONS

A. Terminology used in this Section conforms to the following definitions:

1. Air-blast (Air-overpressure): The atmospheric pressure wave transmitted from the blast outward into the surrounding area. The pressure wave consists of audible sound that can be heard, and the concussion or sub-audible sound which cannot be heard. Air blast is generated by the explosive gases being vented to the atmosphere as the rock ruptures and is expressed in units of pounds per square inch (psi) or decibels (dB) (linear scale).
2. Approved Storage Facility: A facility for the storage of explosive materials covered by a license or permit issued under authority of the appropriate federal, state, or local agency.
3. Blast Area: Blasting area within the shaft and tunnel excavation limits.
4. Blasting Agent: Any material or mixture consisting of a fuel and oxidizer used for blasting, but not classified as an explosive, and in which none of the ingredients is classified as an explosive provided the furnished (mixed) product cannot be detonated with a no. 8 strength detonator.
5. Blasting Operations: Operations that include but are not limited to drill-hole layout, charging, blasthole loading, tie-in, covering, test blasts, production blasts, and blast round firing.

6. Charge-per-Delay: The amount of explosives detonating within any eight millisecond time period, occurring from the beginning to the end of a blast. Detonations within eight milliseconds are considered on the same delay when establishing the maximum pounds per delay in the blast.
7. Close-in Blasting: Rock blasting technique that takes place within one to 40 feet of nearby structures and/or utilities.
8. Controlled Blasting: Special blasting methods used to limit the effects of blasting to within the final lines and grades of an excavation, and to regulate charges of explosives detonated simultaneously, to control peak particle velocities, noise levels, and air-blast overpressure to limits allowed for specific projects and locations.
9. Cushion Blasting: See "Smooth-Wall Blasting".
10. Delays: Term used to describe a blasting cap which does not fire instantaneously but has a predetermined built-in lag or delay.
11. Excavation Line: See Section 31 71 21.
12. Explosive: Any chemical mixtures that reacts at high speed to liberate gas and heat and thus cause tremendous pressures.
13. Flyrock: Rock that is propelled into the air by the force of the explosion. Usually comes from pre-broken material on the surface or upper open face. Flyrock is an indicator of wasted energy.
14. Impulsive Noise: Noise occurring at low frequencies. The spectrum occurring below 15 Hz is generally not audible to humans. For these specifications, the term air-overpressure refers to both audible noise and infrasonic pressure waves that are not audible to humans.
15. Ground Response Factor: A factor related to the geologic conditions and how well the explosive is coupled to the blast hole, it is the particle velocity intercept relating scaled distance to peak particle velocity and typically ranges between 40 and 240.
16. Line Drilling: Controlled Blasting technique where perimeter holes are closely spaced and left uncharged to provide a plane of weakness toward which the blast can break.
17. Lookout: Divergence of shaft and tunnel perimeter blast holes from the specified excavation lines to allow for additional room for the drill head at the beginning of the next blast round.
18. Magazine: Any building, structures, or other container used for the storage of explosives.
19. Mat: Used to cover a shot to hold down flying material; usually made of woven wire cable, tires, or rope.
20. Overbreak: See Section 31 71 21.
21. Peak Particle Velocity (PPV): The maximum ground vibration level (vertical, longitudinal, and transverse) reached at any instant of time during the blast. The actual PPV reports shall be obtained by a seismograph. PPV may be estimated using the following equation:

$$PPV = K\left({}^{D}/_{\sqrt{W}}\right)^{b}$$

Where:

PPV = Peak Particle Velocity in inches per second

K= is the ground response factor at 160

b = a constant at –1.6

D = True distance in feet from shot to specific location or structure

W = Maximum explosive charge weight per 8 millisecond delay

22. Perimeter Holes: A row of holes neatly and uniformly drilled along the excavation line and lookout.
23. Powder Factor: Pounds of explosives per cubic yard of broken rock.
24. Primary Initiation: The main blast executed to sustain production.
25. Probe Holes: See Section 31 23 20.
26. Production Blasting: Refers to rock fragmentation blasts resulting from more widely spaced production holes drilled throughout the main excavation area adjacent to the controlled blast line. Production holes shall be detonated in a controlled delay sequence.
27. Rock Excavation: See Section 31 71 21.
28. Rock Scaling: See Section 31 71 21.
29. Round: A group or set of blast holes constituting a complete cut in underground headings or tunnels.
30. Scaled Distance (Sd): The Square Root Scaled Distance (Scaled Distance, Sd) formula relates ground vibration amplitude to the explosive charge weight per delay and the distance from the blast. The scaled distance requires the explosive charge to decrease with distance from the shot to maintain ground vibration peak particle velocity limits. Defined by the following function:

$$Sd = {D}\Big/{\sqrt{W}^{1/2}}$$

Where:

Sd = Scaled distance

D = True distance in feet from shot to specific location or structure

W = Maximum explosive charge weight per delay

31. Shot: All loaded explosives firing at a given time.
32. Smooth-Wall Blasting: A blasting technique for controlling breakage of rock to the drilled tunnel perimeter. Holes are drilled around the perimeter of the excavation and spaced more closely than the interior blast holes. These perimeter holes are also loaded more lightly than the interior production holes and are fired last in the blast sequencing of the round.
33. Stemming: The inert material, such as drill cutting, used in the collar portion (or elsewhere) of a blast hole to confine the gaseous products formed on explosion. Also, the length of the blast hole left uncharged.
34. Sub-drilling: To drill blast holes beyond the planned grade lines or below floor level.

1.04 SUBMITTALS

A. Action Submittals:

1. Procedures: Section 01 33 00.
2. Qualifications: Not less than 90 days prior to blasting operations, submit resume summarizing the experience and qualifications of the Blaster-in-Charge and Vibration Specialist.

3. Obtain written approval on all submittals specified herein prior to transporting any blasting materials to the site.
4. Blasting Safety and Security Plan: Not less than 60 days prior to blasting operations, submit a general Blasting Safety and Security Plan that includes:
    a. A complete description of clearing and guarding procedures that will be employed to ensure personnel, staff, visitors, and all other persons are at safe locations during blasting. Include details regarding visible warning signs or flags, audible warning signals, method of determining blast area zones, access blocking methods, guard placement and guard release procedures, primary initiation method, and the system by which the blaster-in-charge will communicate with site security guards.
    b. A complete description and design details of blast covering measures for all blasting, including shaft blasting, and tunnel junction chamber blasting to control fly rock and excessive air-overpressure. Use measures which include blast mats, burial, shaft covering, submergence, and other methods required to meet the performance requirements of this Section.
    c. Detailed description of how explosives will be:
        1) Delivered to and from work sites.
        2) Safely kept in day-magazines or in Pennsylvania Department of Transportation (PennDOT) compliant compartments of delivery vehicles while on site.
        3) Transported to and from underground work locations, including police escorts if required by State of local regulations.
        4) How explosives and detonators will be inventoried, secured and guarded to prevent theft or unauthorized use of explosives.
    d. If the Commonwealth of Pennsylvania Fire Marshal authorizes the use of separated magazines to hold explosives and detonators to sustain 24-hour explosives-in-use operations, for all proposed sites, submit detailed plans that include:
        1) Scaled maps indicating proposed locations of separated detonator and explosives magazines.
        2) Maximum storage quantities.
        3) Description of barriers and fences used to shield the site.
        4) Details regarding experience and qualifications persons that will provide 24-hour surveillance and security of the explosive materials.
        5) Details regarding how all explosive materials will be removed from the site during periods when active drilling and hole-charging operations are not occurring.
        6) A letter of authorization from the Commonwealth of Pennsylvania Fire Marshall.
    e. Include Safety Data Sheets (SDS) and specific details about hazard communication programs for employees.
    f. Equipment that will be used to monitor the approach of lightning and electrical storms and in the event of such, evacuation and site safety security plans.
    g. Contingency plans for handling of misfires caused by cut-offs or other causes.

h. Fire prevention plan details, including smoking policies, procedures and limitations for work involving any open flames or sparks, description and location of all fire-fighting equipment, and firefighting and evacuation plans.

i. Initial and ongoing blasting and fire safety training programs.

j. Description of the personal protective equipment that will be used by the Contractor's personnel, including but not limited to, safety glasses, hard-toe footwear, hard hats and gloves.

5. General Blasting Plans: Not less than 60 days prior to blasting operations, submit a General Blast Plan that includes narrative and drawings defining:

   a. Purpose of the blasting plan and description of the locations for blasting.

   b. Working Drawings and Methods Statements:

      1) Location, access, and construction of storage magazines.

      2) Seismograph monitoring procedures.

      3) Methods for handling, transporting, and storing blasting materials on the project.

      4) Security and protective facilities and measures to prevent loss, theft or accidental detonation of blasting materials.

      5) Procedures for pre-blast and post-blast inspections per Section 02 20 00.

   c. Product Data:

      1) Manufacturer’s data sheets for all explosives, blasting agents, primers, initiators, and ancillary blasting equipment and supplies.

      2) Manufacturer’s catalog data identifying model and specifications for all blast monitoring devices.

   d. Graphical and written description for each blasting pattern:

      1) Hole layout, orientation, drilled diameter, length, spacing, anticipated excavation lines, burden, relief holes, delay value of detonator in each charge hole, pounds of explosive per charge hole, and amount and type of any stemming used.

      2) Number and type of detonators subtotaled by delay value, number of delays, and sequence of firing.

      3) Pounds and type of explosive subtotaled by hole and by delay and indicate the type of explosive used for each delay.

      4) Anticipated effective round length, volume of material blasted, and powder factor expressed in pounds of explosive per in-situ cubic yards of material blasted.

      5) Predicted ground vibrations (PPV) at the seismograph locations for each shot.

      6) Calculations showing complying minimum Scaled Distances to all closest structures or utilities of concern.

      7) Stemming of holes, matting, shaft covers, and other measures used to control blast effects.

      8) Qualifications of the person or persons who will be directly responsible for supervising the charging and firing the shot.

      9) Planned concurrent work at the same time as blasting operations and distances associated with that work. Provide the safety protocol and measures for the concurrent work.

10) If proposing to change drilling and blasting methods, submit a revised Blasting Plan for review at least 48 hours prior to use. The revised Blasting Plan is subject to Owner approval.

11) Prediction calculations for noise (air overpressure) and peak particle velocity (PPV) at the closest structure and at other adjacent structures, pipelines or facilities that maybe potentially affected by blasting operations or support of excavation installation.

12) Clearing, guarding and communication procedures to confirm that all persons are evacuated to safe areas and that blast areas are secured prior to blasting.

13) Description of and locations of signage used to announce blast warning signals to prevent persons entering blast areas.

14) Submit any re-design of the blasting program to the Owner.

6. Revised Blasting Plans: If measured intensities of vibration and/or air-overpressures exceed specified limits, movement of blasted rock is not controlled, or excessive overbreak or other damage or unsafe results occur, cease blasting work and submit a revised General Blasting Plan to the Owner. The revised plan should highlight blast design changes that will produce safe and compliant results.
7. General Monitoring Plan: Not less than 60 days prior to commencement of blasting operations or other vibration and noise-inducing operations, submit a General Monitoring Plan that includes:
   a. Names and qualifications of independent persons that will be onsite to set up and operate monitoring equipment and provide measurement results.
   b. Procedures that will be used to identify appropriate monitoring locations and establish accurate distances to individual blast locations.
   c. How elevations and locations (Northing and Easting) of monitoring and blasting locations will be determined and shown on scaled drawings.
   d. Methods of notifying private property owners to obtain permission for access and monitoring, if applicable.
   e. Explanation of how alternative monitoring sites on accessible property closer to the blast will be established if access is denied to a desired monitoring location.
   f. Description of extrapolation calculations based on distances and site attenuation curves that will be used to estimate PPV and peak air-overpressures at inaccessible or other unmonitored locations.
   g. Description of methods for setting instrument trigger levels to assure measurements are successfully recorded.
   h. Manufacturer's technical information descriptions and specifications for all seismograph recording equipment and sensors.
   i. For all instruments and sensors, indicate manufacturer recommendations for calibration, re-calibration period and provide certifications to demonstrate compliance.
   j. Statement verifying that all equipment and operation of equipment will conform to most current standards of the ISEE Vibration Section.

B. Informational Submittals:
   1. Procedures: Section 01 33 00

2. Certifications:
    a. Copy of valid license to store and transport explosives.
    b. Calibration certificates for all monitoring equipment
    c. Licenses and certifications of the Blaster-in-Charge.
3. Permits:
    a. Submit a copy of all applicable permits and licenses for transportation, storage, and use of explosives to the Owner 30 days prior to the start of blasting operations. Submitted permits must include a copy of the Federal ATF blasting license listing all responsible persons, blasting use, storage permits issued by the Commonwealth of Pennsylvania Fire Commissioner's Office, and any other necessary local permits. No explosives can be brought to any work sites until all necessary permits have been submitted to the Owner.
    b. Submit, as needed at the onset of the blasting operations and as new workers are hired, copies of ATF Employee Possessor questionnaire forms (OMB No. 1140-0072) or ATF letters of clearance for all employees that will possess and handle explosives for this work as defined in 27 CFR Part 555. The Contractor's employees, without submitted evidence of satisfactory ATF clearance, must not handle, control or have access to explosive materials. All persons that handle explosive materials, have control over them, or access to them, must NOT be prohibited persons, as defined in Section 555.11 of 27 CFR (ATF Rules).
4. Blasting Records:
    a. Daily Monitoring Reports: Maintain detailed records and submit the following, for each individual blast, to the Owner the same day the blasting is performed:
        1) Date, time and limits of blast by station or shaft elevation.
        2) Type of rock blasted, and round length, including amount of sub-drilling if any.
        3) Reference to approved blast design submittal noting any modifications.
        4) Type, quantity, and weight of explosives, powder factor, total number of delays used, number of holes for each delay period, maximum charge per delay, stemming used and type of detonators.
        5) Name and signature of Blaster-in-Charge, and blaster's State blasting license number.
        6) Time spent scaling rock and approval of rock scaling by designated individual.
        7) On a diagram of the approved blast pattern indicate changes showing holes not drilled, holes drilled but not charged, changes to hole locations, delay timing, and hole charges.
        8) Elevation and plan sketches of the blast indicating advance (length pulled) and areas of significant overbreak or tights and planned adjustments to the blast design for the next blast.
        9) An evaluation of the blast indicating tights, areas of significant overbreak and any recommended adjustments for future blasts.
5. Notifications:
    a. Notify the Owner 24 hours before blasts occur at any specific location.
    b. The Sherwin Williams Company facility near the site uses a sensitive microscope that may be impacted during use by any nearby blasting. The Contractor is required to notify Sherwin Williams of all blasts at this site so that

any operational issues with the microscope can be avoided. This notification shall be 24 hours in advance and also one (1) hour before the actual blasting occurs. Contact information is as follows:

Jeremy Battyanyi
The Sherwin-Williams Company
Pilot Plant Operations Manager
2001 Tracy Street
Pittsburgh, PA 15233
Office: 412-732-3015 | Cell: 412-298-0008
jeremy.battyanyi@sherwin.com

c. Provide the Owner with a schedule for all blasts and notify the Owner if any blast is delayed for more than one hour. Re-shooting missed holes will be allowed, only if they are adequately confined, without advance notice to the Owner. All other monitoring and reporting requirements apply to re-shoots or misfire handling events.

d. Furnish the Owner with a list of those parties notified in accordance herewith prior to the start of such blasting. Include names, addresses and telephone numbers.

e. Submit copies of written notification letters sent to responsible fire protection and police agencies for all sites where explosives are used. Submit to the responsible agencies and copies to the Owner 10 days prior of time explosives are first brought to various work sites. Required minimum content of these letters is discussed within this Section.

C. Closeout Submittals:

1. Procedures: Section 01 33 00.
2. Record Documentation: Prepare, submit, and maintain on-site reports and records, and make accessible to the Owner during normal working hours, including the following:
   a. Blast reports for any blasting work within one day.
   b. Applicable health and safety reporting requirements.
   c. Records from blast monitoring, including comparison of predicted vibrations levels with measured vibration levels.
3. Notifications: Notify the Owner at least eight hours before every blast.

1.05 QUALITY ASSURANCE

A. Qualifications

1. Blasting Consultant
   a. Employ an experienced Blasting Consultant with at least 10 years of full-time experience in:
      1) controlled blasting design for underground excavations in rock.
      2) close-in blasting design with a minimum of two projects.
      3) overseeing blasting operations (test blasts and production blasts).

4) interpretation of ground vibration, air-overpressure for similar construction projects.

b. All blasting plans, test blasting plans and revisions shall be reviewed by and covered with a signed review letter by the Blasting Consultant.

c. The Blasting Consultant will not be required to sign the individual blast plans provided they are signed by an on-site licensed blaster.

d. The Blasting Consultant shall design the initial test blasts and be on site to supervise test blasts until blast designs are developed that minimize damage to rock and meet all requirements for fly rock, vibration and air-overpressure control.

e. Have the Blasting Consultant review all blasting operations and direct such changes in the blasting operations as are required to produce a controlled blasting operation meeting the Project requirements.

f. As a minimum, the Blasting Consultant shall make at least three two-day visits to study site conditions, oversee test blasts, audit and review results of the work, and attend meetings at the request of the Owner. One of the visits shall be when excavation is within the 10 feet vertically of the existing UOIT crown elevation. Should additional on-site presence be necessary to ensure compliance with the Contractor, such work will be performed solely at the Contractor's expense. No extra payments will be made to the Contractor for costs of the Blasting Consultants services and travel.

2. Vibration Specialist

a. Employ the services of an independent company or individual to provide blast-effects monitoring services for this work.

b. The monitoring program and interpretation of the vibration and air-overpressure event reports shall be performed by a professional person with the following qualifications:

1) Possess a Professional License as a registered Engineer, Geologist or Geophysicist in the Commonwealth of Pennsylvania.

2) Have at least 10 years of experience regarding measurement and interpretation of blast-induced vibration and air-overpressure.

3) Can provide references regarding participation as a Vibration Specialist in at least five reference projects with a similar character and proximity to third party structures and receptors, at which controlled blasting was performed.

c. The Vibration Specialist shall select equipment and establish monitoring practices that conform to all specified requirements for the work and satisfy most current standards developed by the Vibration Section of the ISEE.

d. Set up and operate all monitoring equipment by personnel who meet the following requirements:

1) Have at least three years of experience in the operation of monitoring equipment proposed for use and interpretation of records produced by such equipment.

2) Have installed, operated, monitored and interpreted equipment and records on at least three projects.

3) Are independent from and have no conflicts of interests related to the Work, the Contractor, and the Contractor's other suppliers and subcontractors.

4) Can provide documentation regarding successful completion of a training program regarding the use and interpretation of the specific equipment used for this work.

e. The Vibration Specialist shall also interpret the seismograph records to ensure that the seismograph data shall be effectively utilized in the control of the blasting operations with respect to the existing structures.

3. Blaster-in-Charge

a. Employ a Blaster-in-Charge ~~registered Professional Engineer licensed in the Commonwealth of Pennsylvania,~~ with a minimum of five years' of recent experience in preparing blasting plans, handling of explosives, blasting of rock for underground construction for tunnel/shaft excavations, and monitoring of air blast and ground vibrations.

ADD. NO. 6

b. Blaster-in-Charge shall have all licenses and permits required by the Commonwealth of Pennsylvania and other agencies having jurisdiction.

c. Blaster-in-Charge shall be present on-site at all times during blasting operations meeting the requirements stated above.

B. Pre-Construction Meetings

1. Hold jointly with the Owner, meetings at least five days but not more than 30 days prior to the first blast.
2. Review and discuss the following items at each meeting:
   a. Blasting procedures.
   b. Safety requirements.
   c. Monitoring criteria.
   d. Environmental considerations.
   e. Post-blast reporting requirements.

1.06 PERMIT FOR USE OF EXPLOSIVES

A. Have the sole responsibility for obtaining permits for the use of explosives from the individual municipalities, utility companies, or any other governmental agency and to ascertain their requirements for the use of explosives prior to bidding.

B. Handle explosives in accordance with the National Fire Protection Association (NFPA) code for blasting and explosives.

1.07 NOTIFICATION

A. Notify the appropriate local municipal officials, above- and below-ground utility owners and the general public expected to be potentially affected, with the intent to conduct controlled blasting operations. Give notice to all operators of all buried pipes, cables, conduits and overhead utility lines and poles located within a 200-foot radial distance of the blast area.

B. Public notice should be given to any occupants and property owners of all buildings located within 1,000 feet of shaft collars where blasting occurs in shafts or the tunnel junction chamber.

C. Notify in writing the appropriate local municipal officials and utility owners or operators, at least 48 hours prior to the start of blasting if so required by any applicable local law or regulation, and indicate the expected frequency of blasting, hours that blasting might occur and the expected date that blasting will be completed. Upon completion of blasting at the site, notify utility owners or operators that blasting has ceased in the area for the duration of the project.

D. Notification to the general public, including occupants of all residential, business and government buildings reasonably expected to be potentially affected by the blasting shall be done by means of written "door-hanger" type notices approved in advance by the Owner. Give initial notice to property owners at least one week prior to the start of any blasting in the vicinity or sooner if required by local laws or other regulations. The initial notice shall indicate the expected frequency of blasting, hours that blasting is anticipated and the expected date that blasting will be completed. After the initial notice, provide an estimated weekly schedule of anticipated blasting to each affected property owner. Upon completion of blasting at the site, notify affected building occupants and property owners that all blasting has ceased for the duration of the project.

E. At least 10 days before explosive materials are brought to a site, deliver a notification letter to the Chief of the locally responding Fire and Police Departments. This notification letter should include a brief summary of explosive materials that will be on the site, Name of Supplier and delivery routing information, UN Hazard class for all materials, maximum quantities, and an Emergency Contact Listing of the Contractor's blasters and supervisors; include names, phone and cell-phone numbers. When blasting work is completed, send a letter to the same agencies that confirms blasting work is completed. Provide copies of all letters to regulating agencies to the Owner within the same notification periods.

1.08 SYSTEM DESCRIPTION

A. General
   1. The locations for drilling and blasting operations include the following and are shown on the Contract Documents:
      a. Blasting is expected to square the face of the tunnel junction chamber excavation and the shaft excavation within the rock subsurface.
   2. Time restrictions for drilling in blasting: See Section 01 11 20.

B. Design Criteria
   1. Comply with the requirements of Section 01 11 20.
   2. When blasting, do not exceed peak particle velocity and air-blast overpressure limitations, in accordance with the PA Code and as specified herein.
   3. The following table provides the allowable vibration levels, measured by particle velocity criteria, based on the PA Code.

Table 1 – Allowable Particle Velocity, inches per second (ips)

Structure		Max PPV (in/s)
Plant Buildings	Energy Recovery Facility	0.5
	Main Pump Station	0.5

Structure		Max PPV (in/s)
	Electrical Substation	0.5
	Existing West Headworks	0.5
	Others	0.5
Buried Pipes and Utilities		2
Existing River Wall		2
Existing UOIT (using downhole seismograph)		2
Green Concrete	0 - 4 hrs	4 x DF
	4 hrs - 1 day	6 x DF
	1 – 3 days	9 x DF
	3 – 7 days	12 x DF
	7 – 10 days	15 x DF
	10 days and up	20 x DF
*See Table 2		

Table 2 – Distance Factor (DF)

Distance = 0 – 50 ft	DF = 1.0
Distance = 50 – 150 ft	DF = 0.8
Distance = 150 – 250 ft	DF = 0.7
Distance = >250 ft	DF = 0.6

4. Air-blast overpressure requirements are in accordance with PA Code 211.151 measured at the closest building.
5. High water inflows are to be anticipated. Make provisions to work within a highwater inflow environment.
6. Use non-electrical blasting systems.
7. Use controlled blasting methods for all shaft and tunnel junction chamber excavations.
8. Make holes for blasting 3-inches or less in diameter and not be sprung or chambered.
9. Control firing systems of general blast holes by the use of delay detonators.
10. Explosives used for a simple period of delay shall be the minimum required.
11. When water is present in blast drill holes, use a non-nitroglycerin explosive product to prevent drill-hole to drill-hole propagation and to ensure that delay patterns are effective.
12. Vibration data shall include the following:
    a. Ground response factor,
    b. Distance from shot in feet,
    c. Scaled distance (Sd),
    d. Maximum pounds of explosive per 8 millisecond delay,

e. Estimated velocity (ips)

13. Use the upmost care not to endanger life or property, cause slides, or disturb the material outside the excavation lines of the cross section.
14. Air Quality:
    a. Maintain ventilation in compliance with state and federal requirements (OSHA). Ventilation equipment and methods are subject to approval by the Owner.
    b. Wet down the blasted rock to prevent excessive dust during mucking operations.
15. Use smooth-wall blasting methods in shaft and tunnel junction chamber excavations.

1.09 DELIVERY, STORAGE AND HANDLING

A. Procedures: Section 01 65 50.

B. Handle, transport, use, control, store, secure, and monitor explosives as prescribed by the most stringent rules promulgated by the provisions specified in federal, state, and other applicable local codes and ordinances.

C. Storage:
1. The location, access, and construction of explosive storage magazines shall be in accordance with CFR, Title 27; and local permit requirements.
2. Explosives shall not be stored underground.
3. Maintain an inventory record of storage and withdrawal of explosives.
4. Provide a secure storage facility for explosives, including a lockable storage locker with a perimeter fence and gate to prevent loss, theft, or accidental detonation of explosives.

1.10 PROJECT CONDITIONS

A. Blasting must satisfy all regulatory requirements and the Performance Requirements specified herein. Provide all required notifications in advance of each blasting operation.

B. Blasting shall only proceed following approved Blasting Plans as directed by the Owner.

C. Applicable ground conditions are described in the Geotechnical Baseline Report (GBR).

PART 2 PRODUCTS

2.01 EXPLOSIVES, BLASTING AGENTS, AND INITIATING DEVICES

A. Only explosive and initiation devices packaged by federally licensed explosives manufacturing firms shall be used in blasting. All explosives and blasting agents to be used underground shall meet the Fume Class I requirement of the Institute of Makers of Explosives (IME). This restriction does not apply to detonation cords that may be used for trunk lines or in controlled perimeter blasting charges.

B. Use only packaged or cartridge type, non-flowing explosives. Use of black powder, nitroglycerine, bagged ANFO, and bulk explosives is prohibited.

C. Use only packaged or cartridge type, non-flowing explosives that are designed to protect against charge propagation (sympathetic detonation) and dead pressing.

D. Use only non-electric detonating devices or digital-electronic initiation systems.

E. Use of cap and fuse; and conventional analog-current electric detonators is prohibited.

F. Use only explosives designed and manufactured for smooth wall (trim) blasting in perimeter holes. The linear charge-weight-per-foot of explosives used in shaft perimeter and tunnel back and rib holes shall not exceed 0.4 lb/ft. This limitation does not apply to the primer stick, which must not weigh more than 0.5 pounds. Products in trim holes include detonating cord as well as cartridge configurations.

G. Keep explosives, blasting agents, primers, initiators, and ancillary blasting materials in original packaging with clearly marked date codes. Use explosives and initiating devices less than one year old.

H. If the Owner determines that a blasting product appears to be in a damaged or deteriorated condition, do not use the suspect product until its condition can be determined. Immediately return products found to be damaged or in a deteriorated condition to the supplier for safe disposal.

2.02 STEMMING

A. Use stemming material all charged drill holes, both vertical and horizontal. Crushed stone, tamped clay, or other inert earth material placed in the unloaded collar area of blastholes. Manufactured stemming products will be considered. Paper may not be used as stemming material.

2.03 DRILLING EQUIPMENT

A. Use equipment for drilling of holes with positive means of dust control.

2.04 MONITORING EQUIPMENT

A. Use seismographs that meet the requirements of Section 31 09 13.

2.05 BLAST MATS

A. Cover all blasts in shaft and the tunnel junction chamber excavations with a sufficient number of steel-cabled mats, soil, or other substantial covering device in order to prevent damage, generation of fly rock outside of the shaft and open cut excavations, injury to persons and property, including the structure and equipment used in connection with shaft or tunnel operation, from flying rock or other material. To protect detonators from damage, first cover the blast surface with weed-barrier fabric and six or more inches of sand or soil before heavy blast mats are placed. The unit weight of blast mats shall be at least 30 lb/ft2. Overlap mats at least 3 feet and extend 3 feet beyond blast limits or folded so they extend 3 feet up vertical walls at the edge of a blast.

PART 3 EXECUTION

3.01 GENERAL

A. Work Hours:

Location	Monday-Friday	Saturday	Sunday/Holidays*
All blasting operations	7:00 a.m. to 7:00 p.m.	9:00 a.m. to 5:00 p.m.	Blasting not allowed

*As defined in the General Conditions and all federal, state, and local government-recognized holidays.

B. Execute drill-and-blast tunnel and shaft excavations in accordance with CFR, Title 29 and the requirements herein.

C. Notify the Owner in advance of each blast as specified herein.

D. Blasting shall not be permitted when, in the opinion of the Owner, the Contractor's blast design may be detrimental to existing works or result in unacceptable environmental impacts.

E. Acceptable controlled blasting methods shall be those using smooth-wall blasting, cushion blasting, and line drilling techniques. Use of "pre-splitting" in shafts and surface excavations is specifically prohibited.

F. Do not perform blasting closer than 10 feet to existing water, gas, sewer, or other buried utilities, and in areas as shown on the Contract Drawings unless approved by the Owner.

G. Regardless of the requirements herein, be responsible for damage to property or injury to persons resulting from blasting and for accidental or premature explosions that may occur in connection with Contractor's use of explosives.

H. Control flyrock and debris to prevent injuries to persons or damage to structures. Use blasting mats. Contain fly rock so that it shall not represent a hazard to people, vehicles, existing improvements, or vegetation.

3.02 WARNING SYSTEMS

A. Follow all warning requirements of local, state, and federal agencies. Institute a system of audible signals to warn of impending blasts per PA Code 211.155.

B. Erect signboards stating that blasting operations are taking place in the area. Make signs clearly visible and legible from all points of access to the area and shall clearly describe the audible signal system for warning of impending blasts.

C. Mark storage places with signs, in accordance with applicable regulations.

3.03 EXPLOSIVES-IN-USE REQUIREMENTS

A. No unattended overnight storage of explosives is allowed for this Work.

B. Amounts of explosives and detonators kept at individual work sites shall not exceed the amounts allowed in written agreements authorized by the Chief of the regulating fire departments.

C. While kept at surface areas of sites, explosives and detonators shall be kept in separated day-magazines confirming to all OSHA rules, or in separated compartments of delivery vehicles confirming to PennDOT rules.

D. Records shall be maintained of explosives received, used and returned to the supplier during each day of operations at each work site.

E. When on site, explosive materials shall be attended to at all times by the supplier's CDL-Hazmat licensed driver or by the Blaster-in-Charge or a trained and qualified member of the blasting crew.

F. All explosive and detonator boxes (cartons) shall be destroyed upon full emptying of explosive materials. No explosive material boxes shall be reused to contain anything other than the explosive materials that the box markings indicate.

3.04 OPERATION DURING ELECTRICAL STORMS

A. All transportation of explosives on the surface or underground, and any handling, blast charging, or tie-in operations shall be stopped immediately upon the approach of an electrical storm, and all persons shall immediately be evacuated from the blasting area to a place of safety. Underground personnel shall be notified of the approach and cessation (all clear) or an electrical storm, each by means of different signals. In shafts or other excavation handling explosives, loading of holes, connecting up or firing of charges shall not be performed during an electrical storm and all persons shall withdraw to a safe distance from a partially or totally loaded face. During such storms, explosives and detonators on the surface shall be left in OSHA approved transport containers, compartments of PennDOT compliant delivery vehicles, or in approved day-storage magazines. At all times, explosives shall be guarded and secured by the Contractor's personnel from safe locations.

3.05 POST-BLAST SAFETY

A. After each blast, follow applicable safety regulations prior to returning to the blasting area. Personnel may then enter the blasting area with appropriate respiratory equipment or wait until air quality meets acceptable standards.

B. After a blast has been fired, make a careful inspection to determine that all charges have exploded before anyone is allowed to return to the operation. Correct misfires in accordance with the applicable portions of federal, state, and local safety and health codes for blasting. Before drilling blast holes for a new round, clean the face and thoroughly examine it for missed holes and unexploded explosives.

C. Remove all loose and shattered rock that may endanger the structure or the workers. Make the excavation safe before proceeding with the work.

D. Monitor and inspect the condition of initial support following each blast round within 50 feet of the round.

3.06 INSTRUMENTATION AND MONITORING

A. Refer to Section 31 09 13 for monitoring equipment requirements and Contract Documents for locations of required instruments.

3.07 SUSPENSION OF BLASTING

A. Blasting operations shall be suspended by the Owner for any of the following reasons:
   1. A licensed and preapproved Blaster-in-Charge is not physically on a site where explosives are handled.
   2. Safety precautions are inadequate.
   3. Uncontrolled movement or blasted rock or debris.
   4. Air overpressure or ground vibration levels exceeding specified limits.
   5. Existing structural conditions on-site or offsite are aggravated or are damaged by blasting.
   6. Blasting causes damage to rock outside the prescribed limits of excavation.
   7. Failure to adhere to the submitted and accepted blasting plan.
   8. Seismograph monitoring is not successfully performed as required.

B. Blasting operations shall not resume until the Owner has reviewed and approved the Contractor's revised blasting plan with modifications correcting the conditions causing the suspension.

3.08 DAMAGE

A. Restore or replace; utilities, equipment, and structures damaged by over-blasting, fly rock, vibrations and air-overpressure at no additional cost to the Owner.

END OF SECTION

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SECTION 41 22 13.13
RADIAL BRIDGE CRANES AND HOISTS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Section includes:
   1. This section provides specifications for radial bridge cranes with telescoping girders, patented track girder and steel hanger system for anchorage to supporting structure hoists, trolleys, and associated drive units and controls. All cranes shall be designed in accordance with CMAA-70.

B. Type:
   1. The unit shall be a under running double girder bridge crane. Hoist shall be of the heavy duty, wire rope type, and the trolley shall be the four-wheel type. Runway beams, rails, and bridge beams shall be as specified in this section.

C. Equipment List:

   1. Equipment numbers are as follows:

Item	Equipment No.
Radial Bridge Crane #1 - Pump Room	CRN001-430
Radial Bridge Crane #2 – Motor Room	CRN002-430

1.02 RELATED SECTIONS

A. This section contains references to the following related sections. Additional related sections may apply that are not specifically listed below.
   1. Section 01 61 45 Area Exposure Designations
   2. Section 01 73 24 Design Requirements for Non-Structural Components and Non-Building Structures
   3. Section 05 10 00 Structural Steel Framing
   4. Section 26 29 23 Variable Frequency Motor Controllers
   5. Section 43 05 11 General Requirements for Equipment
   6. Section 43 05 21 Common Motor Requirements for Equipment

1.03 REFERENCES

A. 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.

Reference	Title
ASME B30.2	Overhead and Gantry Cranes (Top Running, Single or Multiple Girder)
ANSI MH 27.1	Specifications for Underhung Cranes and Monorail Systems
CMAA 70	Crane Manufacturer's Association of America Electric Overhead traveling Cranes
HMI	Hoist Manufacturer's Institute
OSHA	Occupational Safety and Health
IBC	International Building Code
UCC	Pennsylvania Uniformed Construction Code

1.04 ADMINISTRATIVE REQUIREMENTS

A. Assign unit responsibility, as specified in section 43 05 11 to the radial bridge crane equipment manufacturer or system supplier for all equipment specified in this section. Provide a completed, signed, and notarized Certificate of Unit Responsibility (Form 43 05 11-C, Section 01 99 90).

1.05 SUBMITTALS

A. Action Submittals:
   1. Procedures: Section 01 33 00.
   2. 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 form specification requirements.
   3. 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 Design Engineer 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.
   4. Completed Certificate of Unit Responsibility attesting that the Contractor has assigned, and that the manufacturer accepts, unit responsibility in accordance with the requirements of this section and Section 43 05 11. No other submittal material will be reviewed until the certificate has been received and found to be in conformance with these requirements.
   5. Runway beam structural calculations as specified per CMAA 70. Loads to the building frame structure shall be provided in calculations. Calculations shall be stamped by a registered engineer in the Commonwealth of Pennsylvania.

6. Anchorage calculations for runway beams and patented girder steel hanger system and anchorage to embedded plates. Calculations shall be signed and sealed by a professional engineer experienced in structural engineering and licensed in the Commonwealth of Pennsylvania. Design shall consider the as-built survey of the embedded plates and meet the tolerances in the Contract Documents.

B. Informational Submittals
   1. Drawings, showing physical details, including dimensions of the bridge crane and hoist equipment.
   2. Submit shop drawings showing clearance dimensions, and details of construction for crane installation.
   3. Manufacturer's catalog data, including weights, rated capacity, and equipment speeds, electrical requirements, and materials of construction.
   4. Elementary, internal, and external schematic and connection diagrams. These diagrams shall consist of complete wiring and panel diagrams and drawings showing wiring and terminal board numbers.
   5. Motor data forms.
   6. Electrical diagrams and schematics.
   7. Horsepower requirements
   8. Design calculations for the custom lifting device specified herein. Calculations shall be in accordance with ASME BTH-1, latest revision, stamped by a professional engineer licensed in the Commonwealth of Pennsylvania.
   9. Drawings, showing physical details of the custom specialty lifting device specified herein. Include in the drawings, a dimensionally accurate section view showing the path of travel of the rigged pump rotating assembly out of, and into the pump casing.

C. Closeout Submittals
   1. Procedures: Section 01 33 00.
   2. Operating and maintenance submittals: Section 01 33 04.
   3. Installation Certification Section 43 05 11-Form A.
   4. Instruction Certification Section 43 05 11-Form B.
   5. Furnish the following spare parts:
      a. Set of any special tools required for maintenance activities
      b. One spare wireless remote controller.
      c. One complete set fuses.
      d. One hoist wire rope

1.06 QUALITY ASSURANCE

A. Manufacturer's Qualifications:
   1. The bridge crane manufacturer shall be one who is regularly engaged in the business of designing, building, and repairing bridge cranes of the type specified in this section. All bridge crane components and appurtenances furnished for this contract shall be
   2. designed, coordinated and supplied by a single manufacturer.

1.07 DELIVERY, STORAGE AND HANDLING

A. Procedures: Section 01 65 50

1.08 SPECIAL WARRANTY

A. Provide a Special Warranty in accordance with Section 01 78 36. Manufacturer shall warrant Radial Bridge Cranes against defects in materials and workmanship for five years from the date of Substantial Completion.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. The following candidate manufacturers are capable of producing equipment and/or products that will satisfy the requirements of this Section. All products specified herein shall be provided by a single supplier. The manufacturer's standard product may require modification to conform to specified requirements:
   1. G.W. Becker
   3. Mazzella
   4. Morgan Engineering
   5. Deshazo
   6. Approved Equal.

2.02 PERFORMANCE/ DESIGN CRITERIA:

A. The cranes shall be furnished with the heavy-duty under running hoist with double girder bridge crane. Crane and hoist shall be Class "D" as defined by the Crane Manufacturer's Association of America (CMAA) in accordance with CMAA Specification 70.

B. Runway beams, complete with connections to the building structural system, splices, and runway stops, and shall be furnished by the crane manufacturer. All beams shall be designed and sealed by a registered structural engineer in the Commonwealth of Pennsylvania.

C. Hooks approach distances and high hook position shall be as shown on the Drawings. The Contractor is advised to carefully examine the drawings for interferences and obstructions, which might impose additional limitations upon the equipment.

2.03 OPERATING REQUIREMENTS:

A. Crane will be used for intermittent equipment maintenance. Operating requirements shall be as follows:

ADD NO. 6

Item	CRN001-430	CRN002-430

Item	CRN001-430	CRN002-430
Rated capacity, tons	15	15
Hoist Type	Electric wire rope	Electric wire rope
Environment	Indoor Wet	Indoor Wet
NEC Area Classification	Unclassified	Unclassified
Maximum span between runways, feet	10'-0 "	10'-0 "
Inner runway radius (rail centerline), feet	32'-1"	32'-1"
Inner hook limit radius, feet	33'-6"	33'-6"
Outer hook limit radius, feet	44'-1"	44'-1"
Telescoping span past runway, feet	3'-6"	3'-6"
Hoist Height, feet	25	25
Hoist motor horsepower, (max)	28.2	28.2
Trolley motor horsepower, (max)	2.0	2.0
Telescoping motor horsepower, (max)	2.0	2.0
Bridge motor horsepower, (max)	2.0	2.0
Hoist, feet per minute	24 (stepless)	24 (stepless)
Trolley, feet per minute	100 (stepless)	100 (stepless)
Telescoping Girders, feet per minute	75 (stepless)	75 (stepless)
Bridge, feet per minute	100 (stepless)	100 (stepless)
Control	Radio control	Radio control

B. Materials

Component	Material
Runway beams	Steel, ASTM A36
Bridge beams, telescoping girders, trolley, patented track girder, and structural steel appurtenances	Steel, ASTM A36
Hoist gearing, trolley wheels, end truck wheels, hook	Steel
Welding and Bolting	Section 05 10 00

2.04 EQUIPMENT FEATURES

A. Runway Beam:
   1. Runways shall be straight, parallel, and level, and be specially designed for this application. The runway beams shall be designed for a maximum deflection of 1/600 of span. Runway rail shall be AISE, selected for proper loading.

B. Bridge:
   1. The main girder shall be rigidly attached to end trucks. Permanent stops shall be provided to prevent trolley overrun. The bridge beam shall be designed for a maximum deflection of 1/800 of span.

C. End Truck:
   1. The bridge crane end truck shall carry the rated load between the end truck wheels while the rated load is lifted at one end of the crane bridge. End truck wheelbases shall be 1/8 of the span.
   2. A rubber bumper shall be mounted on each end of the end truck. Safety lugs shall be provided to limit drop of the end truck to 1 inch or less in the event of wheel or axle failure.
   3. All bearings shall be fitted with seals to exclude dust and moisture and shall be lubricated for life.
   4. Crane wheels shall be alloy steel with tread surfaces hardened to 375 to 425 Brinell. Axles and wheels shall be removable without disturbing other trunk elements.

D. Trolley:
   1. Trolley wheels shall
   2. be hardened steel, mounted on permanently lubricated anti-friction bearings. The trolleys shall be motorized and shall be designed for top running hoist application.

E. Hoist:
   1. Hoist shall be double reeved.
   2. The hoisting drums shall be grooved and designed for one layer of wire rope. Hoist gearing shall be heat-treated hardened steel, running in an oil bath. Gear bearings shall be the oil-lubricated anti-frication type, and all bearings shall be designed for a Class M2 (20,000 hour) bearing life.
   3. A geared upper and lower limit switch and plugging upper limit switch shall be provided to assure safe operation and positive stopping under all conditions. The geared limit switch shall automatically stop the motor and engage the hoist brake when the hook reaches either its upper or lower limit of travel. The hoist shall be provided with a load limiting device adjusted not to exceed 125 percent of rate capacity.
   4. Each load hook shall be mounted on ball thrust bearings to swivel without twisting the wire rope. The lifting tackle shall be of the safety type, and the hook shall be of hardened steel equipped with a safety catch. Sheaves shall be properly guarded and shall be heavy pattern, deep flanged, and properly grooved. Sheaves shall either be bronzed, bushed, or fitted with ball bearings, and supported on fixed pins.

5. Hoist motor brake shall be magnetically operated disc type or shoe type, mounted on the extended pinion shaft, and designed for a torque rating to 150 percent of the motor full load torque. Brake shall be equally effective in both directions of motor rotation and of sufficient size to stop motor and hold rated capacity load. Brake shall be set automatically when current is not flowing to the motor. Brake shall be self-adjusting to allow for normal wear of the brake lining.
6. The Contractor shall furnish and install an identification plate on the hoist housing. The identification plate shall be of clearly legible permanent lettering giving the manufacturer's name, model number, capacity, and other essential information. In addition, the identification plate shall display the equipment number for the hoist that is identified hereinbefore.

F. Motors:
1. Motors shall be 1,860 RPM, 460-volt, 3-phase, TEFC or TENV motors for crane/hoist duty service. Motors shall be specially designed for Class I crane service. Hoist motors shall be rated for adjustable frequency duty. Bridge and trolley motions shall be through reversible, adjustable frequency rated electric motors.
2. Controller shall be capable of providing control range up to 40:1, hoists with load brake up to 10:1. Control circuit shall provide soft start/soft stop (dynamic braking), acceleration control, phase loss protection, user programming, and ability to store and retrieve fault history. Controls shall be all contained in single enclosure rated per Section 26 05 00.
3. Bridge and trolley motors shall drive the bridge and trolley through enclosed gear reducers. Gear reducers shall be enclosed heavy-duty helical, or spur gear type, of a self-lubricating design, with anti-friction bearings. Brakes shall be solenoid actuated. The hoist motor bearings shall be lubricated and shall be designed for a Class M3 (50,000 hour) bearing life.

G. Electrification and Controls:
1. All electrical and control equipment shall comply with the requirements of Division 26 and 40.
2. The crane manufacturer shall furnish and mount all electrical equipment on the crane including motors, control, and conduit. Bridge conductors may be removed for shipment. All wire on the crane shall be furnished by the crane manufacturer, cut to length, and installed as far as practical for shipment.
3. Electrification of each bridge shall be by insulated festooned bridge conductors. Conductors shall be complete with all necessary insulation, supports, and appurtenances, and shall meet NEC requirements. Each hoist shall be provided with a lock-out main isolating switch. Crossbridge electrification shall be flat cable festooned type supported in an enclosed track.
4. The Contractor shall provide breakers in accordance with the Drawings and 460 V / 3 phase electrical feed up to a conductor bar, which the crane manufacturer shall provide and install for the purpose of adequately electrifying all components as needed for Owner’s desired crane operation.
5. Speed Control shall be via Variable Frequency Drive (VFD) for low-sway travel motions and smooth, safe, and exact positioning. Variable speed controls shall be two, three or five step or infinitely variable or fully proportional with a low speed of 1/10th the

high speed for precise spotting. Acceleration and deceleration rates shall be adjustable within a range of 0.2 to 0.8 feet/second/second.

6. Primary control of all motions shall be via radio control. Hoist control shall have levers to control each direction of the bridge, hoist and trolley travel. Provide charging station and wall mounted lock box for storage of the controller when not in use.
7. Secondary control of all motions shall be able with a sliding push button pendant suspended from the bridge. A Gleason torque reel shall be supplied to allow easy adjustment of the pendent height up to 25'. Hoist control shall be by a single multiple-detent push button for each direction, plus a separate single-detent push button for creep. Bridge and trolley motion control shall be by dual-detent push buttons, one for each direction.
8. The radio control shall be keyed with an interlock on the pendant to lock out the pendant when radio is in use.
9. An additional emergency stop switch shall be provided on the transmitters and pendant.
10. As multiple cranes may be located in close proximity to each other, crane controls via radio control where specified shall operate on unique radio frequencies or codes to avoid interference with operation of all other cranes.
11. All controls shall be clearly marked with etched or engraved nameplates.
12. Provide crane warning system consisting of beacon light and horn. Beacon light shall flash whenever crane components are powered. Horn shall be activated by push button on operator's wireless controller.
13. Power supply for hoist equipment will be 460V, 3 phase, 60 Hertz. The Contractor shall provide the power feeder with a local disconnect switch to the hoist controller. Control power transformers shall be provided as necessary by the manufacturer.

2.05 PRODUCT DATA

A. The following information shall be provided in accordance with Section 01 33 00:
   1. Applicable operations and maintenance information as specified in Section 01 33 04.
   2. Factory tested certification.
   3. Motor data in accordance with Section 43 05 21.
   4. Installation Certification Form 43 05 11-A included in Section 01 99 90.
   5. Training Certification Form 43 05 11-B included in Section 01 99 90.

2.06 FINISHES

A. Procedures: Section 09 90 00

B. Prime Coat: shop-applied, coating material per 09 90 00

C. Finish Coat: shop-applied, coating material per 09 90 00

2.07 CUSTOM LIFTING DEVICE

A. Scope

1. The crane manufacturer shall provide a custom detachable lifting device capable of lifting each wet weather pump's (PWW001-430, PW002-430, PWW003-430, PWW004-430, PWW005-430, PWW006-430) internal rotating element as a single assembled unit, out of, and into the pump casing.
2. The crane manufacturer shall provide a custom detachable spreader bar for the wet weather pump motors (PWW001-430MO, PWW002-430MO, PWW003-430MO, PWW004-430MO, PWW005-430MO, PWW006-430MO). ADD. NO. 2
3. The lifting device shall be designed in accordance with ASME BTH-1, Design Category B, Service Class 0.

B. Required Coordination
1. The crane manufacturer shall coordinate with the pump manufacturer to determine the appropriate rotating element pick-points, center-of-gravity, weight, removal clearance, and other design criteria required for design of the lifting device.
2. The crane manufacturer shall coordinate with the motor manufacturer to determine the appropriate motor pick-points, center-of-gravity, weight, removal clearance, and other design criteria required for design of the spreader bar. ADD. NO. 2

C. Materials and Construction
1. The custom lifting device shall be constructed of ASTM A36 Steel or equivalent. Requirements of AWS D14.1 shall govern the design and procedure of welded members. If a conflict exists between AWS D14.1 and ASME BTH-1, the more stringent requirement shall be met.
2. After fabrication, epoxy coat the lifting device in accordance with Section 09 90 00.

D. Identification
1. Legibly mark the rated load of the lifting device on a permanently fixed tag. Epoxy attachment of the tag is not acceptable.
2. Include the information required by ASME B30.20 on the permanently fixed tag.

E. Dimensional Requirements
1. The lifting device shall ensure that the pump rotating assembly remain in its in-situ vertical orientation during removal from, and reinstallation into the pump casing.

PART 3 EXECUTION

3.01 INSTALLATION

A. The bridge crane, patented track girder and steel hanger system, trolley, and hoist shall be installed at the location shown and in accordance with manufacturer's recommendations.

B. All concrete embedded plates supporting the bridge crane shall be surveyed prior to fabrication and installation of structural steel hanger system.

C. Welding and bolting shall be in accordance with Section 05 10 00.

3.02 FACTORY TESTING

A. Manufacturer shall test the equipment in accordance with industry standards and federal regulations prior to shipment of the equipment. Crane, trolley, and hoist shall be completely assembled and no load run tested prior to shipment to the job site. Crane shall be disassembled to the least amount possible for shipment. The test certification shall be provided.

B. After completion of installation, the bridge crane, trolley, and hoist shall be completely tested to ensure compliance with the performance requirements as specified. As a minimum, testing shall be by operating the equipment through a complete lift and lowering cycle, and through a complete travel of the bridge and runway beams to determine that the tests shall be carried out with the hoisting equipment loaded as near to the specified capacity as possible. Any defects shall be corrected or replaced immediately by the Contractor and at no expense to the Owner. All testing and the costs of all required certification shall be at the Contractor's expense. Testing load shall be supplied by Contractor.

C. Factory test the custom lifting device specified herein. The test weight shall satisfy the requirements of ASME B30.20 and be representative of the pump rotating assembly, plus an additional factory of safety.

3.01 FIELD QUALITY CONTROL

A. General testing, documentation and minimum Ready to Test requirements are defined in Section 01 75 00.

3.02 EQUIPMENT AND SYSTEM START UP

A. Procedures: Section 01 75 00.

B. Complete Manufacture's required physical check out and integrate Manufacture's required Functional Tests in addition to those listed below.

C. Perform the following Functional Test.

1. After completion of installation, the radial bridge crane, trolley, and hoist shall be completely tested to ensure compliance with the performance requirements as specified. As a minimum, testing shall be by operating the equipment through a complete lift and lowering cycle, and through a complete travel of the bridge and runway beams to determine that the tests shall be carried out with the hoisting equipment loaded as near to the specified capacity as possible. Any defects shall be corrected or replaced immediately by the Contractor and at n
2. o expen
3. se to the owner. All testing and the costs of all required certification shall be at the Contractor's expense. Testing load shall be supplied by the Contractor.

3.03 FACILITY STARTUP PERIOD AND BENEFICIAL USE

A. Refer to Section 01 75 00.

B. Facility Startup Period cannot be initiated until completion of all Functional Tests and Performance Tests, including documentation in accordance with Section 01 75 00.

3.04 MANUFACTURER SERVICES

A. On-Site Inspection and Training: Provide a factory-trained manufacturer's representative at the Site for the following activities. Specified durations are defined in Section 01 71 16.
   1. Equipment Installation Inspections: Assist, supervised, and inspect the Contractor's activities during installation. Provide complete form included in Section 01 71 16 and Form 43 05 11-A Section 01 99 90.
   2. Equipment Startup: Assist, supervise, and inspect the Contractor's activities during the Equipment Startup specified in Section 01 5 00 and this Section.
   3. Acceptance Testing: Assist, supervise, and inspect the Contractor's activities during Acceptance Testing specified in Section 01 75 00.
   4. Performance Testing: Assist, supervise and inspect the Contractor's activities during the Performance Testing specified in Section 01 75 00.
   5. Facility Startup: Assist, supervise and inspect the Contractor's activities during Facility Startup period specified in Section 01 75 00 and this Section.
   6. Training Sessions: Procedures Section 01 75 00. Conduct four total training sessions: two for mechanical maintenance, and two for electrical maintenance. Two training sessions per week on two consecutive weeks to accommodate the shift schedules of operation and maintenance staff. Certify completion of training on Form 43 05 11-B, Section 01 99 90.

3.05 USE BY CONTRACTOR

A. Use of any radial crane and hoist during contractor's work is prohibited with the exception of unloading and installing pumps, valves, and piping that are part of the finished work. The Contractor assumes all responsibility for operation and maintenance until a certificate of substantial completion is issued by the Owner. Radial crane and hoist shall be re-inspected by the Manufacturer and any identified issue shall be repaired, repainted and otherwise refurbished to like-new condition prior to the certificate of substantial completion by Owner.

END OF SECTION

ATTACHMENT – B

Addendum No. 6 Revised Geotechnical Baseline Report

ALLEGHENY COUNTY SANITARY AUTHORITY
PITTSBURGH, PENNSYLVANIA
CONTRACT DOCUMENTS

VOLUME 4 OF 5
Including
GEOTECHINICAL BASELINE REPORT

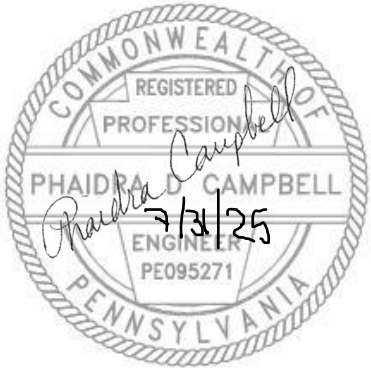
For

CONTRACT NUMBER 1800 G, E, H, P
WET WEATHER PUMP STATION
G – General
E – Electrical
H – HVAC
P - Plumbing

JULY 2025
(Revised in Addendum No. 6)

DOCUMENTS PREPARED BY:

JCK Underground, Inc. | A Schnabel Engineering Company



ALCOSAN

Contract No. S-489

Wet Weather Pump Station

Geotechnical Baseline Report (GBR)

Revised in Addendum No. 6

Version 2.0

July 2025

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Section 1

Introduction

This Geotechnical Baseline Report (GBR) has been prepared for the Wet Weather Pump Station (WWPS) S-489 Project (the Project), which is part of the Allegheny County Sanitary Authority (ALCOSAN) Wet Weather Plan (WWP) Expansion Program. The Project will provide an increase of plant capacity for peak flows and peak wet weather flows. This GBR should be reviewed in conjunction with the Geotechnical Data Report (GDR) and Contract Documents prepared for this Project.

1.1 Purpose and Scope

The purpose of this GBR is to establish contractual baselines describing the anticipated ground conditions and behavior to be encountered during construction of the Wet Weather Pump Station and Tunnel Junction Chamber. The baselines established in this GBR shall be used by the Contractor in bid preparation and will also be used to evaluate potential Differing Site Conditions (DSC) encountered during construction. To evaluate construction means and methods, selection of equipment, and development of construction plans, the Contractor is required to read and consider the GBR, the GDR, and all other Contract Documents in their entirety.

Ground behavior will be influenced by, among other factors, the construction sequence and methods employed by the Contractor, as well as the Contractor's equipment, materials and workmanship. The Contractor should take the information in this GBR into consideration when assessing impacts that the ground and groundwater conditions will have upon their selected construction operations, means and methods.

1.2 Project Elements Covered by GBR

This GBR pertains only to the Wet Weather Pump Station Shaft and Tunnel Junction Chamber.

This GBR does not establish baselines for other construction elements, including the excavations and foundations for the near surface structures, utilities or WWPS basement. The GBR contains limited discussion regarding excavated material classifications, such as 'Residual Waste', 'Other Contaminated Waste', 'Excavated Clean Fill', 'Regulated Fill', or 'Construction/Demolition Waste'. Refer to Specification Section 31 23 00 for definitions. Refer to the GDR for details of environmental conditions and analytical test results.

1.3 Sources of Geotechnical Information

The GBR should be read in conjunction with the GDR, which contains geotechnical data from the field investigations and laboratory testing completed for this Project. The reader is also referred to geotechnical data from previous investigations conducted by others in the vicinity of the Project. The geotechnical and geologic interpretations presented in this GBR supersede all such interpretations presented in prior reports, memoranda, and other documents.

1.4 Limitations

The baseline values presented in this report were developed from geotechnical information and data gathered through exploratory borings, laboratory and field tests, and other relevant factors such as local construction experience. The judgment applied in the interpolations and extrapolations of this

information reflects the view of the Owner in establishing the baseline conditions. The geotechnical baseline conditions presented in this report are not a warranty that these conditions will, in fact, be encountered.

Section 2

Project Description

The Clean Water Plan will substantially increase the capacity of the existing ALCOSAN treatment plant to receive more flows during wet weather. The construction of the 120 MGD WWPS is necessary to increase the peak wet weather flow capacity at the treatment plant as well as regulate flow for the new Regional Tunnel system by controlling storage and upstream CSO occurrences. Operating in conjunction with the new Main Pump Station, the new WWPS will allow the plant to achieve the combined peak capacity of 600 MGD during wet weather events. The Project site (Site) is located adjacent to the Ohio River near the west end of Tracy Street as shown on Figure 1. See Specification Section 01 11 00 for a detailed description of the Project summary of work.

Unless otherwise noted, this report references the Alcosan Plant Vertical Datum and Alcosan Plant Coordinates. Refer to the Contract Documents and the GDR for details.

Section 3

Existing Structures Significant to Construction

Significant existing structures at the Site include the Upper Ohio Interceptor Tunnel (UOIT) and the River Wall, as described in the following sections. Selected as-built drawings of each structure are shown on Figure 2. Refer to the Drawings and Specifications for instrumentation and monitoring of these structures during construction of the Project.

3.1 Upper Ohio Interceptor Tunnel

Constructed between 1956 and 1959, the UOIT conveys flows to the existing Main Pump Station and is located to the east of the proposed pump station. The UOIT is an approximately 15-foot excavated diameter tunnel constructed in rock with an inside invert elevation at approximately Elev. 616 ft at the Site. Initial support in this reach of the UOIT consisted of steel ribs, and the final liner consists of 10.5-foot inside diameter (I.D.) precast reinforced concrete pipe.

The UOIT has been approximately located as shown on the Drawings based on as-built drawings and the results of a crosshole seismic tomography survey (Hager-Richter, 2024).

Refer to the Contract Documents for the complete as-built drawings for the UOIT.

3.2 River Wall

The river wall forms the Ohio River shoreline adjacent to the Site. Constructed in the mid-1950's to replace an existing wall, the river wall consists of a cellular cofferdam structure approximately 284 feet (ft) long and 39 ft wide. Each cell consists of interlocked flat steel sheet piles approximately 55 ft long and, according to the 1953 plans, tipped into bedrock. The cells are backfilled with granular fill. The top of the wall is at approximately Elev. 727 ft, indicating that up to approximately 11 ft of fill was placed behind the land side of the river wall to create the existing grade. Temporary sheet piling and railroad tracks behind the land side of the wall are also shown on the 1953 plans.

The Contractor is directed to the following Contract Documents for additional details:

- Mueser Rutledge Consulting Engineers, 2023, River Wall Inspection Data Report Wet Weather Pump Station Project No. S-489 Final Design
- Metcalf & Eddy, 1953, Pittsburgh Sewage Treatment Plant River Wall Plans
- River Wall to shaft proximity at closest point is referenced in the Contract Drawings along with surcharge limitations on River Wall

River wall elevations discussed herein and in the River Wall Inspection Data Report are referenced to the North American Geodetic Vertical Datum of 1929 (NGVD29).

Section 4

Previous Construction Experience

This section provides information on previous underground projects in geologic conditions similar to those anticipated during the construction of the Project. Relevant project locations are shown on Figure 3.

4.1 Previous ALCOSAN Projects

A summary of relevant previous ALCOSAN projects is included in the following sections. Further details of these projects are included in the "ALCOSAN Wet Weather Program Existing Deep Tunnel Interceptor Construction Summary Report", prepared by CDM Smith and dated October 25, 2018. Select photographs of previous construction activities are included in Figure 4.

4.1.1 Existing Wastewater Treatment Plant

The existing ALCOSAN WWTP was constructed at a site previously occupied by two steel mills. The Main Pump Station for the plant required construction of an approximately 106-foot diameter, 102-foot deep shaft. Overburden was 50 ft thick and supported with steel sheet piles driven to rock and ribbed with circular beams (Laboon, 1961). According to Laboon, 1961, the 72-vertical foot rock excavation was completely unsupported; however, photographs provided by ALCOSAN indicate at least three rows of pattern rock bolts were installed directly below the circular ribs.

According to Laboon (1961), the excavation was "very wet, especially at the top of rock where a bed of overlying gravel was encountered." Excavation through rock was also "wet". A 5-foot thick reinforced concrete bottom slab was anchored to rock using grouted bars to resist uplift.

4.1.2 Deep Tunnel Interceptors

From 1956 to 1959, ALCOSAN constructed approximately 30.5 miles of tunnel as part of a capital improvement program designed to significantly improve its sewage collection and treatment facilities. Contracts 46, 47, 49, and 52 included a total of seven 14- to 25-foot diameter work shafts; eighty-three 8- to 36-inch diameter downshafts and ventilation shafts; and 15.6 miles of 7- to 15-foot wide tunnel constructed in rock.

Work shafts were generally constructed by sinking reinforced concrete caissons through overburden to the bedrock surface. Notably, steel ribs and liner plate were used for initial support for the work shaft at Contract 52 (approximately 10 miles from the Site), and significant delays were experienced dealing with unstable ground and groundwater ingress. Bedrock was excavated using drill and blast methods on each of the contracts. Following completion of excavation, the shafts were lined with concrete to the ground surface.

Contract 46 included the construction of the UOIT (refer to Section 3.1 for details) from an access shaft at Belmont Street. The Belmont Street shaft was constructed by sinking a 24-foot I.D., 36-inch thick reinforced concrete caisson through approximately 65 ft of overburden. A second work shaft was constructed at Tracy Street, however details on the location, dimensions and construction of this shaft are not available.

Except for the unsuccessful attempt to use a TBM in Contract 49 due to operating difficulties and maintenance costs, drill and blast methods were used to advance all tunnel excavations in rock.

Construction records suggest that the back (crown/roof) tended to break horizontally, creating a more orthogonal than curved profile above the springline. Initial support, where required, consisted of roof bolts or steel ribs. Steel liner plates were specified for use in "earth or soft rock".

Groundwater ingress significantly impacted shaft and tunnel excavation. Drilling operations at the tunnel face were often slowed by groundwater ingress, and ponding or flooding between the heading and access shafts also occurred. During shaft construction for Contract 52, continuous pumping was required once the excavation reached a depth of 21 ft, and an exterior dewatering well was also installed.

To mitigate groundwater ingress into the tunnels, grout was injected from the tunnel face to reduce the ground permeability. Each of the contracts used a similar approach to grouting, with 1-inch to 2.5-inch grout holes and injection pressures of 100 psi to 500 psi specified. Water/cement ratios ranged from 0.5 to 0.8 by weight, and probe holes were required to be maintained 20 ft ahead of holes drilled for blasting. The effectiveness of the grouting programs could not be accurately evaluated based on the available data.

Naturally occurring gas was confirmed to have been present in the ground, having accumulated in tunnels and shafts on several occasions. A gas explosion occurred at the base of an intermediate shaft during construction of Contract 47.

4.2 North Shore Connector Tunnel Project

The North Shore Connector (NSC) tunnel project is located just east of the confluence of the Allegheny and Monongahela Rivers. The project consists of twin tunnels excavated through soil and rock below the Allegheny River and a narrow city street using TBM and cut-and-cover methods. Each of the twin TBM tunnels is 2,240 ft long and excavated to a diameter of 22.8 ft using a Herrenknecht slurry TBM. Final lining of the TBM tunnels consists of 11-inch thick precast segments (Zick, 2009).

Subsurface conditions encountered at the TBM launch and receiving pit generally consist of fill overlying alluvial and fluvioglacial deposits. The alluvium generally consists of slightly overconsolidated, soft to stiff silty clay or very loose to loose clayey sand, generally with low shear strength and low permeability. The fluvioglacial deposits overlying bedrock consist of dense to very dense, highly permeable granular materials, with zones of coarse gravel and cobbles near the bedrock surface (Miller et al., 2008).

The launch pit, receiving pit, and cut-and-cover tunnel section were supported primarily using cement deep soil mixing walls with internal horizontal bracing and tiebacks, which provided groundwater cutoff to the bedrock elevation. Slurry walls were used to construct the North Shore Station using the top-down method, while soldier piles, whalers, struts and lagging were used to support the excavation where the tunnels transition from below-grade to an aerial structure. Jet grouting was also used for ground improvement and groundwater cutoff at the launch and receiving pit and at various locations along the tunnel alignment (Zick, 2009).

The tunnel was primarily mined through soft ground and mixed-face conditions, with a short reach of full-face hard rock conditions directly below the Allegheny River. Bedrock encountered during the tunnel drive consisted primarily of horizontally dipping shale, siltstone, claystone and sandstone, with coal and limestone seams also present. Minor faulting and jointing was present in the bedrock but did not cause any problems during mining (Zick, 2009).

According to Zick (2009), "Groundwater was a factor in all excavations. The valley fill deposits provided a relatively permeable aquifer that was continuously recharged by the adjacent rivers, and the aquifer generally responds quickly to changes in river pool excavations." However, no instances

of production impacts due to groundwater were noted in any of the NSC project references reviewed for this GBR.

Section 5

Geologic Setting

5.1 Regional Geology

The Site is underlain by the Glenshaw Formation of the Conemaugh Group, a Pennsylvanian-aged group of sedimentary rocks approximately 600 ft thick. The Conemaugh Group is a heterogenous unit comprised of "cyclic sequences of sandstone, shale… and thin limestone and coal" (Wagner et al., 1975), the lower portion of which comprises the Glenshaw Formation. While less than 2% of the outcropping bedrock in the Pittsburgh region is composed of coal (Kohl and Briggs, 1975), the coal beds serve as important stratigraphic "marker beds" due to their persistent areal distribution. The Conemaugh Group is bounded at the top by the Pittsburgh Coal and the bottom by the Upper Freeport Coal. Minor coal beds are also present within the group (Wagner et al., 1975).

Bedrock units and bedding are generally horizontal or dipping slightly to the south on the limbs of folds that trend north to northeast. Faults in the region are "few and minor in offset" (Kohl and Briggs, 1975).

While the limits of glaciation remained well to the north of Pittsburgh, periglacial activity to the south of the glacial limits caused mass wasting and breaking up of bedrock at the ground surface. Glacial activity also generally reversed the flow direction of the Ohio and Allegheny Rivers, which then transported glacial outwash sediments to the south, resulting in the deposition of dense sand and gravel alluvium that is currently present across the Pittsburgh area (Gray, et al., 2015).

5.2 Regional Hydrology

The Site is located in the Pittsburgh Low Plateau Section of the Appalachian Plateau Physiographic Province. The area is characterized by smooth to undulating surface topography with narrow and shallow river valleys exhibiting a dendritic drainage pattern. The Site is adjacent to the eastern bank of the Ohio River, which, along with the Allegheny and Monongahela Rivers, serves as the primary surface water drainage for the region (Gray et al., 2015).

Groundwater in the region flows primarily through glacial outwash alluvial deposits which overlie much of the bedrock. Groundwater flow through bedrock is generally concentrated along stress-relief fractures resulting from erosion and unloading of rock units along stream valleys (Gray, et al., 2015). The Ohio River is hydraulically connected to the Site, and groundwater levels at the Site are generally controlled by the level of the Ohio River.

Section 6

Ground Characterization

6.1 Geologic Units

6.1.1 Soil

The overburden soils at the Project site are expected to consist of the following geologic strata in superposition:

- Fill
- Alluvium
- Residuum

The general characteristics of each of these strata are described in the following sections. The soils are classified with the Unified Soil Classification System (USCS).

6.1.1.1 Fill

Fill materials are present at the ground surface throughout the Site. Fill was generally placed using methods that resulted in poorly- to well-compacted soils. Fill contains varying amounts of clay, silt, sand, gravel, cobbles and boulders, mixed with man-made debris such as wood, steel, slag, concrete and brick. The USCS group symbols for soils in the Fill include GP, GW, SM, SP-SM, SW-SM, and CL. The Fill also includes coal fragments and zones of 'Residual Waste', 'Other Contaminated Waste', 'Excavated Clean Fill', 'Regulated Fill', and/or 'Construction/Demolition Waste' as defined in Specification Section 31 23 00.

Obstructions were not encountered in the borings that penetrated the Fill, however obstructions will be encountered during shaft excavation through the Fill.

6.1.1.2 Alluvium

Alluvium soils underlie the Fill throughout the Site. Alluvium soils are typically characterized by cross-bedding, varying bed thicknesses and variable particle size grading. The Alluvium at the Site typically consists of very loose to dense sand and gravel deposits, with varying amounts of fine-grained soils. Non-continuous silt or lean clay layers are occasionally interbedded with the more predominant coarse-grained materials. The USCS group symbols for soils in the Alluvium include GM, GP, GW-GM, GP-GM, and SM.

Cobbles and boulders will be encountered within the Alluvium near its contact with the underlying Residuum.

6.1.1.3 Residuum

A layer of residuum (residual soil) underlies the Alluvium. This unit typically consists of dense to very dense, highly to completely weathered siltstone or sandstone. The USCS group symbols for soils in the Residuum include GM, GP, and GP-GM.

6.1.2 Bedrock

The top of bedrock is defined as the elevation at which the weathering state of the ground transitions from highly weathered to moderately weathered, slightly weathered or fresh.

Bedrock at the Site consists of interbedded sedimentary rocks, with bedding that is primarily horizontal to gently dipping, rippling, or cross-bedded. Excavation of the WWPS shaft will encounter the following rock types: sandstone, siltstone, shale, claystone, coal and limestone.

The baseline amount of each rock type as a percent of the total rock excavation is included in Table 6-1.

Table 6-1: Baseline Relative Percentage of Rock Types to be Excavated

Rock Type	Baseline Percent of Rock Excavation
Siltstone	55 ± 5%
Sandstone	30 ± 5%
Shale	7 ± 2%
Claystone	5 ± 2%
Coal	2 ± 1%
Limestone	<1%

Each primary rock type described below will include interbeds, laminations, nodules or stringers of the other primary rock types, in addition to pyrite, limonite or calcareous nodules.

- Siltstone – Siltstone is fine to very fine grained, indistinctly to medium bedded and includes argillaceous and carbonaceous siltstones. Shaley or sandy siltstone cross bedding will also be encountered in this rock unit. Fossils and iron-oxide inclusions including hematite and limonite are present in the siltstone. Slickensides along discontinuities are common. Siltstone is fresh to slightly weathered with occasional moderately weathered zones, and soft to moderately hard.

- Sandstone – Sandstone is very fine to medium grained, indistinctly to medium bedded, and includes argillaceous, calcareous, carbonaceous, and micaceous sandstones. The sandstone unit will include limestone, shale, pyrite and calcareous inclusions presenting as laminations, veins, nodules or stringers. Coal laminations and seams less than 4 inches thick are also present. Bedding is typically horizontal, rippling or cross-bedded. Sandstone is fresh to slightly weathered, and moderately hard to hard with occasional moderately soft zones.

- Shale – Shale is very fine grained, very intensely to very thinly bedded and may be carbonaceous or calcareous with abundant fossils. Discontinuities may be clay-filled and slickensided. The shale is considered fissile and is commonly encountered as interbeds or seams within sandstone, siltstone or coal layers. Shale layers will not always be continuous across the entire Site. Shale is fresh to slightly weathered, and soft to moderately soft.

- **Claystone** – Claystone is very fine grained, indistinctly bedded, and sometimes calcareous or argillaceous. Discontinuities are typically slickensided. Claystone will commonly be encountered as interbeds or seams and the claystone layers will not always be continuous across the entire Site. Claystone is slightly to highly weathered with one completely weathered zone at the top of rock, and soft to very soft.

- **Coal** – Coal is very fine grained, indistinctly bedded and very intensely to thinly bedded, and will be encountered in distinct layers and as interbeds or laminations within the siltstone, shale and sandstone units. The coal layers are up to 3 ft thick and are commonly pyritic. Coal is fresh to moderately weathered, and very soft to moderately soft.

- **Limestone** – Limestone is very fine grained, indistinctly bedded and not continuous across the Site. Limestone is fresh to moderately weathered, and moderately hard to hard.

6.2 Soil Properties

The baseline soil properties for the Project are shown in Table 6-2.

Table 6-2: Baseline Soil Properties

Soil Property	Units	Fill			Alluvium			Residuum		
		Min	Max	Average	Min	Max	Average	Min	Max	Average
Moist Unit Weight	lb/ft^3	105	145	130	115	145	130	135	150	145
Moisture Content	%	15	55	25	10	40	20	10	20	15
% passing #200	%	5	45	20	5	35	15	5	20	10
Liquid Limit	%	20	40	30	N/A			N/A		
Plasticity Index	%	5	15	10						
Hydraulic Conductivity	cm/sec	10^{-5}	10^{-1}	--	10^{-5}	10^{-1}	--	10^{-5}	10^{-1}	--

Notes:

1. Atterberg Limits reflect the plasticity of fine portion of soil.
2. N/A: Not applicable

6.3 Intact Rock Properties

6.3.1 Unit Weight

Table 6-3 provides a summary of baseline unit weight for each rock type.

Table 6-3: Baseline Rock Unit Weight

Rock Type	Unit Weight (pcf)		
	Minimum	Maximum	Average
Siltstone	160	175	165
Sandstone			
Shale			
Claystone			
Limestone			
Coal	85	95	90

6.3.2 Strength

Table 6-4 provides a summary of baseline Unconfined Compressive Strength (UCS) and tensile strength of intact rock for each rock type.

Baseline UCS values were generated based on the results of UCS (ASTM D7012) and Point Load Index (ASTM D5731) laboratory testing. Baseline tensile strength values were generated based on the results of splitting tensile strength (ASTM D3967) laboratory testing.

Table 6-4: Baseline Unconfined Compressive Strength and Splitting Tensile Strength of Rock

Rock Type	Unconfined Compressive Strength, UCS (psi)			Splitting Tensile Strength (psi)		
	Minimum	Maximum	Average	Minimum	Maximum	Average
Siltstone	2,500	15,000	9,000	500	2,000	1,200
Sandstone	4,000	17,000	10,000	1,600	2,500	2,100
Shale	2,000	8,500	5,500	800	1,200	1,000
Claystone	850	1,300	1,100	800	1,200	1,000
Coal	1,000	3,000	2,000	400	600	500
Limestone	4,000	17,000	10,000	1,600	2,500	2,100

6.3.3 Abrasivity

Baseline abrasivity values were generated based on the results of Cerchar Abrasivity Index tests performed in accordance with ASTM D7625. For baseline purposes, the Contractor shall assume that the Sandstone and Shale rock types are medium abrasive, and the Siltstone, Claystone, Coal and Limestone are low abrasive.

6.3.4 Slake Durability

Claystone, coal, shale and siltstone encountered at the Site are susceptible to slaking. Baseline slake durability index values based on tests performed in accordance with ASTM D4644 are included in Table 6-5.

Table 6-5: Baseline Slake Durability Index Values

Rock Type	Minimum	Maximum	Average
Claystone	0	40	10
Coal	90	100	95
Shale	80	100	85
Siltstone	85	100	90

6.4 Rock Mass Properties

6.4.1 Discontinuities

Discontinuities consist of bedding planes or widely to very widely spaced, slightly open joints that are slightly rough to rough, with fresh to slightly weathered surfaces and no infilling. Open, decomposed, or clay/silt infilled joints are also present along with slickensides.

Bedding planes are horizontal to sub horizontal, with the mean plane orientation dipping 2 degrees to the southeast. Jointing is typically parallel to bedding, but steeply dipping to vertical joints with random orientation will be encountered.

6.4.2 Rock Mass Quality

Rock mass quality was evaluated using the Rock Mass Rating system (RMR, as defined by Bieniawski, 1988). The RMR was calculated for 10-foot intervals of rock core for the full depth of each test boring. For baseline purposes, 85% of the rock encountered will be classified as Fair Rock, Good Rock, or Very Good Rock according to the RMR system. The remaining 15% will be classified as Poor Rock or Very Poor Rock, which will be intermittently encountered between Elev. 660 ft to 677 ft, Elev. 620 ft to 640 ft, and Elev. 560 ft to 570 ft as shown on Figures 6 and 7.

6.4.3 Equivalent Hydraulic Conductivity

Equivalent rock mass hydraulic conductivity (k) was evaluated based on the results of 93 in-situ packer tests performed in the test borings at the Site (Figures 6 and 7). Considering the interbedded nature of the rock mass, hydraulic conductivity varies greatly. For baseline purposes, rock mass hydraulic conductivity will range from $<10^{-7}$ cm/sec to 10^{-1} cm/sec.

6.5 Groundwater Conditions

The baseline static groundwater level at the Site is between Elev. 710 ft and 715 ft. The 100-year flood elevation is Elev. 725.65 ft.

6.6 Acid Producing Rock

Acid base accounting (ABA) testing was conducted to measure the capacity to supply alkalinity and acidity. For baseline purposes, acid producing rock may be encountered between Elev. 635 ft to 625 ft, Elev. 579 ft to 563 ft and Elev. 545 ft to 531 ft. Refer to the GDR for details.

6.7 Noxious or Explosive Gases

Gas measurements made at the top of casing for test boring FD-70-002 after drilling to Elev. 550 ft indicated a methane level of 28% of the Lower Explosive Limit (LEL). Refer to the GDR for details.

Additionally, gassy conditions have been encountered in previous projects in similar ground in the region. As such, the shaft and tunnel junction chamber excavations will be “potentially gassy” with respect to toxic and combustible gases.

The classification of “potentially gassy” is contingent upon the execution of ventilation methods by the Contractor. Refer to Occupation Safety and Health Administration (OSHA) 29 CFR 1926.800 for definitions, limitations, and testing requirements.

Section 7

Shaft Construction Considerations

Detailed discussions of specific ground and groundwater conditions expected during construction of the WWPS shaft and tunnel junction chamber are presented in this section. Refer to the Drawings for sequencing of the shaft construction.

7.1 Ground Conditions

The anticipated soil, rock and groundwater conditions at the Site are shown on Figures 6 and 7, which were compiled using subsurface data from the test borings. Refer to Section 6.0 for ground characterization of the soil and rock. Table 7-1 provides the baseline of the anticipated ground conditions for construction of the WWPS shaft.

Table 7-1: Baseline Ground Conditions

Stratum	Top of Stratum Elevation (ft)
Fill	727 +/- 2
Alluvium	690 +/- 5
Residuum	680 +/- 2
Bedrock	677 +/- 3

7.2 Excavation and Ground Support

The shaft excavation will require installation of continuous excavation support to control ground movement, prevent loss of ground, minimize groundwater inflows, withstand lateral ground and groundwater pressures as required, and provide a stable and safe excavation to support construction activities.

Means and methods selected by the Contractor for mass excavation are subject to the restrictions provided in the Contract Documents.

7.2.1 Slurry Diaphragm Wall in Soil and Bedrock

The excavation support system in soil consists of a slurry diaphragm wall. The excavation support system will be socketed into rock to Elev. 654 ft as a means of providing additional cutoff of groundwater inflow into the open excavation. Contractor shall select means and methods capable of constructing the slurry wall panels through soil and bedrock with strengths indicated in Table 6-4. Contractor shall select means and methods capable of constructing slurry wall panels through obstructions~~, and bedrock~~ with strengths up to 25,000 psi.

ADD. NO. 6

Contractor shall assume that obstructions within overburden soils will reduce excavation rates including frequent mucking of panel bottoms. For baseline purposes, Contractor shall assume that

5% of each slurry wall panel trench volume, excavated in soil, will consist of obstructions. Chisels, reamers or other mechanical means may be required to break up obstructions.

Verification of panel vertical alignment is required to ensure that the panels do not become misaligned to such an extent that the finished slurry wall will not work as a compression ring. Refer to the Contract Documents for verticality tolerances.

Careful control of slurry density and levels will be required to maintain sidewall stability during panel excavation, and to minimize ground losses. Gravel soils are anticipated within the Fill and Alluvium.

Requirements for handling and disposal of excavated soil and rock are included in Specification Section 31 23 00.

7.2.2 Stoppages

A stoppage is defined as an obstruction within the slurry wall panel excavation that reduces the excavation rate to less than 6 vertical inches over a 4-hour period and requires the employment of special tools (i.e., chisels, reamers, etc.) and/or excavation techniques and procedures, including drilling, excavating, or coring, to remove, break up or push aside the obstruction. Stoppages will be paid through an allowance payment per Specification Section 01 22 00 and further details are included within Specification Section 31 56 00.

The following items will not be measured in the field, paid for separately, or considered a differing site condition:

- Stoppage less than 10 ft below the existing ground surface.
- Obstructions encountered in mass excavations of the shaft.
- Bedrock excavation.

ADD. NO. 6

7.2.3 Soil-Rock Interface

The Residuum soil unit forms the transition zone between soil and bedrock. Mass excavation in the residuum can be conducted using conventional excavating equipment such as mechanical excavators. For baseline purposes, refer to Table 7-1 for top of bedrock elevation.

7.2.4 Bedrock

Refer to Table 6-4 for rock strength properties, Section 6.0 for intact rock properties, Table 7-1 for top of bedrock elevation, and Figures 6 and 7 for anticipated rock types.

As stated above, the excavation support system will be socketed into rock and the Contractor shall select means and methods capable of constructing the slurry wall panels through bedrock. Chisels, reamers or other mechanical means will be required to excavate the rock socket.

Prior to commencing mass bedrock excavation, vertical dowels for reinforcement of rock adjacent to the UOIT shall be installed. Refer to Specification Section 31 72 13 for details.

Mass excavation of bedrock within the shaft will be conducted using drill and blast and mechanical excavation methods. Drill and blast excavation is precluded within the ‘No Blasting Zone’ shown on the Drawings to prevent vibration-induced damage to existing structures. A roadheader or excavator-mounted rock cutter will be required for rock mass excavation in this zone.

Overbreak is expected during mass rock excavation due to the orientation and spacing of discontinuities. Modifications to blast designs may be required to reduce overbreak. A minimum 3-foot-wide rock key at the base of the shaft shall be excavated as shown on the Drawings to provide uplift resistance for the permanent pump station shaft.

The initial support of mass excavation in rock will consist of pattern dowels, welded wire fabric, and shotcrete with drainage mats and weep holes. In some areas, the pattern of rock reinforcement will need to be supplemented with additional spot rock dowels as necessary to stabilize the mass excavation. Refer to Specification Section 31 72 13 for details.

As the effective moisture content increases, the excavated claystone materials may transform into a cohesive clay, exhibiting the potential for stickiness and clogging. Contractor shall provide means and methods for cleaning equipment as necessary.

Claystone and coal layers will not exhibit sufficient standup time to allow for the installation of pattern dowels prior to applying shotcrete. Where exposed in the shaft, the claystone and coal will require placement of an initial coat of shotcrete to minimize ground loss within one hour of excavation.

A coal layer will be encountered at or near the shaft invert. Coal is highly susceptible to degradation due to construction traffic. To prevent damage to the invert, a minimum 6-inch thick mudslab is required as shown on the Drawings. Contractor design of this mudslab shall account for means and methods, anticipated equipment, and groundwater inflow. ADD. NO. 6

Vibration and noise monitoring is required to be performed by the Contractor in conjunction with drilling and blasting, mechanical excavation, or other construction operations that induce ground vibrations as required in Specification Section 31 09 13.

7.3 Grouting and Groundwater Control

To control or reduce groundwater inflow from the rock mass into the open excavation, pre-excavation grouting from the ground surface is required prior to excavation of the shaft. In addition, probe holes and cutoff grouting from inside the shaft excavation will be required in accordance with Specification Section 31 23 20. ADD. NO. 6

For baseline purposes, it is expected that a “steady state” groundwater infiltration rate of up to 1,500 gpm will be encountered during shaft construction at the shaft sidewalls and invert after pre-excavation and cutoff grouting operations. This estimate is based on the assumption of an impervious slurry wall support of excavation in the overburden soils and socketed into rock, and grouted rock conditions. ADD. NO. 6

In addition to steady state groundwater infiltration, transient, or “flush” flows (infiltration from localized zones of highly permeable rock or individual features in the rock mass) of up to 250 gpm are possible. Such flush-flows are not accounted for in the estimated steady state infiltration rates provided, thus the actual peak inflow rate into the WWPS shaft will vary significantly depending on the occurrence and duration of the flush flows. For baseline purposes, the duration of flush flows should be anticipated to be 2 weeks.

~~To control or reduce groundwater inflow from the rock mass into the open excavation, pre-excavation grouting from the ground surface is required prior to excavation of the shaft. In addition, probe holes and cutoff grouting from inside the shaft excavation will be required in accordance with Specification Section 31 23 20.~~ ADD. NO. 6

Section 8

Junction Chamber Construction Considerations

8.1 Ground Conditions

The Contractor shall expect to encounter ground conditions similar to those described in Section 6. At the junction chamber elevation, the primary rock types are sandstone, siltstone and claystone.

Claystone will be encountered at or near the junction chamber invert. Claystone is highly susceptible to slaking due to changes in moisture content, and also degradation due to construction traffic. To prevent damage to the invert, a minimum 6-inch thick mudslab is required as shown on the Drawings. Contractor design of this mudslab shall account for means and methods, anticipated equipment, and groundwater inflow.

ADD. NO. 6

8.2 Excavation and Ground Support

Excavation of rock within the junction chamber will be conducted using drill and blast, mechanical excavation, or both methods. Blasting is precluded in the case where the ORT, at the contract interface with the WWPS, has been constructed prior to the WWPS as shown on the Drawings.

Overbreak is expected during bedrock excavation due to the orientation and spacing of discontinuities. Modifications to blast designs may be required to reduce overbreak.

The initial support of excavation of rock in the junction chamber will consist of steel ribs, rock dowels, shotcrete, spiles and welded wire fabric. Refer to Specification Section 31 72 13 for details. Placement of initial support shall begin within one hour following excavation to minimize the potential for rockfall from the junction chamber roof due to the presence of horizontal and sub-horizontal discontinuities.

8.3 Grouting and Groundwater Conditions

Groundwater inflow into the junction chamber will be pumped out through the shaft. The steady state inflow baseline value provided in Section 7.3 includes the anticipated groundwater inflows from the junction chamber.

Section 9

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Section 10

Figures

Chartiers Creek Tunnel Extension (CCTE)

Chartiers Creek Tunnel (CCT)

ARROXIMATE PROJECT SITE LOCATION

Allegheny River Tunnel (ART)

Ohio River Tunnel (ORT)

Sawmill Run Tunnel (SMRT)

Monongahela River Tunnel (MRT)

ALCOSAN NORTH

TRUE NORTH

N

SCALE: 1" = 4500'

OHIO RIVER

SCALE: 1"=50'

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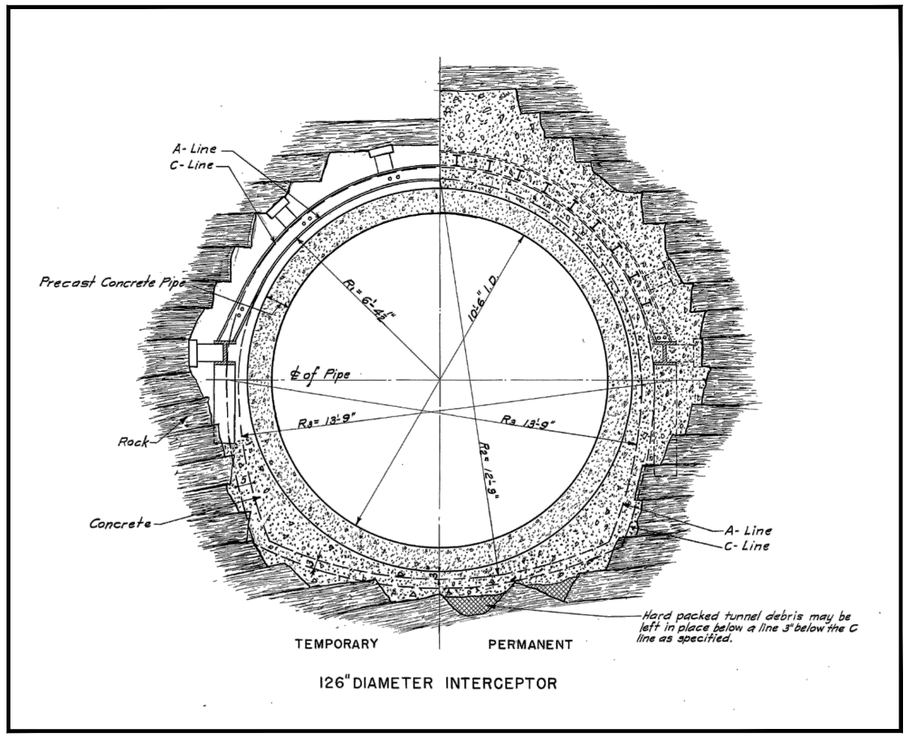
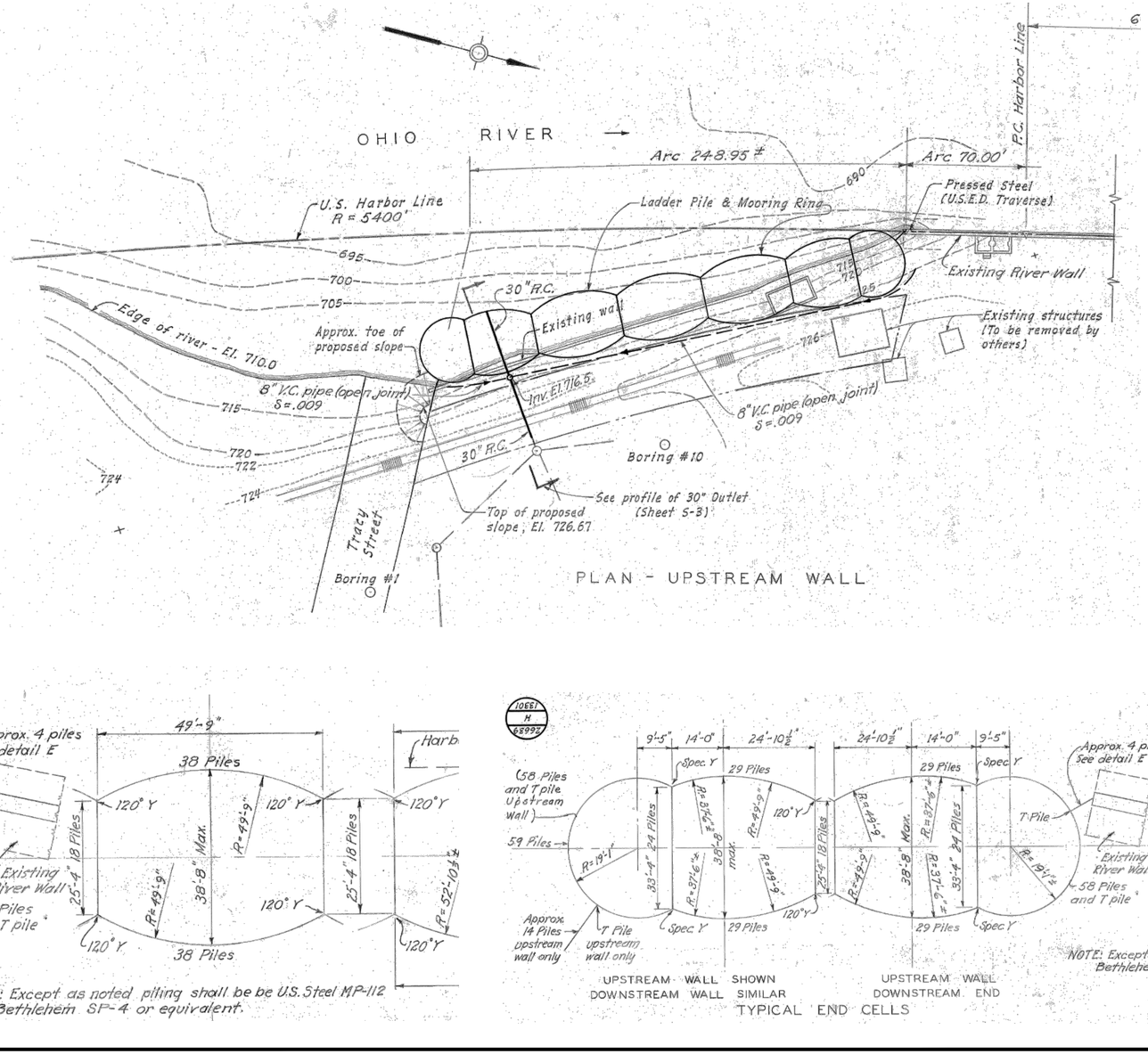
ALCOSAN WET WEATHER PUMP STATION
PROJECT SITE LOCATION MAP

FIGURE 1



126" DIAMETER INTERCEPTOR

UOIT AS-BUILT INITIAL SUPPORT AND FINAL LINING IN VICINITY OF WWPS



RIVER WALL AS BUILT PLAN AND DETAILS

Schnabel ENGINEERING	ALCOSAN WET WEATHER PUMP STATION SELECTED AS-BUILT DRAWINGS OF EXISTING STRUCTURES	FIGURE 2

ARROXIMATE PROJECT SITE LOCATION

CONTRACT 46

CONTRACT 47

CONTRACT 49

CONTRACT 52

NORTH SHORE CONNECTOR TUNNEL

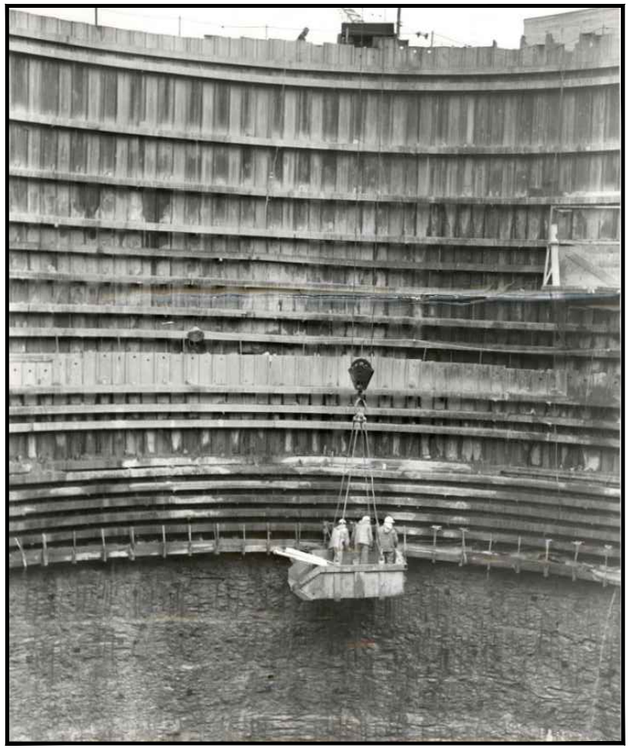
McKees Rocks
Ohio River
Brunot Island
Ingram
Thornburg
Crafton
Millvale
Etna
Sharpsburg
Allegheny River
Arsenal
Aspinwall
Sycamore Run
Pittsburgh
Monongahela River
Green Tree
Carson
Dormont
Baldwin
Saw Mill Run
Brentwood
West Homestead
Swissvale
Rankin
Munhall
Whitaker
Penn H

ALCOSAN NORTH
TRUE NORTH
N 22°24'-00" W
TRUE NORTH
PROJECT NORTH

SCALE: 1" = 4800'

Schnabel ENGINEERING	PREVIOUS TUNNEL CONSTRUCTION SUMMARY	FIGURE 3

PHOTO 1



MAIN PUMP STATION WET WELL CONSTRUCTION.
STEEL SHEETING EXCAVATION SUPPORT THROUGH SOIL AND PATTERN ROCK BOLTS IN ROCK.

PHOTO 2

MAIN PUMP STATION.
SHOT OF COMPRESSED AIR TO REMOVE ROCK AND SOIL FROM HOLE. POSSIBLE TIE-DOWN ANCHORS VISIBLE IN INVERT.

PHOTO 3

TYPICAL DEEP TUNNEL INTERCEPTOR CONSTRUCTION.
NOTE UNSUPPORTED ROOF WITH HORIZONTAL CROWN BREAK. CONTRACT AND LOCATION UNDOCUMENTED.

Schnabel ENGINEERING

ALCOSAN WET WEATHER PUMP STATION
PREVIOUS TUNNEL AND SHAFT CONSTRUCTION PHOTOGRAPHS

FIGURE 4

UNIFIED SOIL CLASSIFICATION SYSTEM

BASED ON ASTM D2488

MAJOR DIVISIONS	GROUP/GRAPHIC SYMBOL	TYPICAL DESCRIPTION
COARSE- GRAINED SOILS More than 50% retained on No. 200 Sieve	GW	WELL-GRADED GRAVEL
	GP	POORLY GRADED GRAVEL
	GW-GM	WELL-GRADED GRAVEL WITH SILT
	GW-GC	WELL-GRADED GRAVEL WITH CLAY
	GP-GM	POORLY GRADED GRAVEL WITH SILT
	GP-GC	POORLY GRADED GRAVEL WITH CLAY
	GM	SILTY GRAVEL
	GC	CLAYEY GRAVEL
	SW	WELL-GRADED SAND
	SP	POORLY GRADED SAND
	SW-SM	WELL-GRADED SAND WITH SILT
	SW-SC	WELL-GRADED SAND WITH CLAY
	SP-SM	POORLY GRADED SAND WITH SILT
	SP-SC	POORLY GRADED SAND WITH CLAY
	SM	SILTY SAND
	SC	CLAYEY SAND
FINE- GRAINED SOILS 50% or more passes No. 200 Sieve	ML	SILT
	CL	LEAN CLAY
	OL	LOW PLASTICITY ORGANIC SOIL
	MH	ELASTIC SILT
	CH	FAT CLAY
	OH	HIGH PLASTICITY ORGANIC SOIL

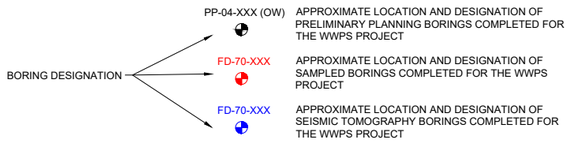
QUALITATIVE DESCRIPTION OF GRANULAR SOIL DENSITY

DESCRIPTOR	N-VALUE
VERY LOOSE	0-4
LOOSE	5-9
MEDIUM DENSE	10-30
DENSE	31-50
VERY DENSE	>50

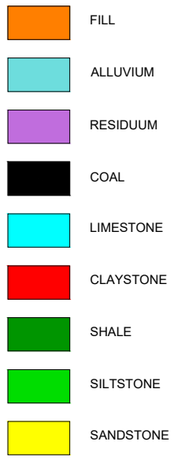
BORING LOCATION PLAN AND GEOTECHNICAL PROFILE NOTES:

1. NOT ALL BORINGS ARE SHOWN ON THE PLAN OR PROFILE FOR CLARITY. REFER TO THE GDR FOR LOCATIONS OF ALL BORINGS CONDUCTED FOR THE PROJECT AS WELL AS BORINGS DRILLED BY OTHERS.
2. SEE CONTRACT DRAWINGS FOR LOCATION OF EXISTING AND PROPOSED STRUCTURES RELATIVE TO THE GEOTECHNICAL BORINGS.
3. LINE REPRESENTING TOP OF ROCK ARE BASED ON INTERPOLATION BETWEEN BORINGS AND TOPOGRAPHY SHOWN ON THE PROFILE.
4. ALL ELEVATIONS ARE IN FEET AND REFERENCED TO ALCOSAN PLANT DATUM.
5. INDICATED BORING OFFSETS ARE MEASURED PERPENDICULAR TO THE SECTION CUT. OFFSET TO THE LEFT (L) INDICATES BORING IS OFFSET TO THE LEFT OF THE CENTERLINE LOOKING UPSTATION. OFFSET TO THE RIGHT (R) INDICATES BORING IS OFFSET TO THE RIGHT OF THE CENTERLINE LOOKING UPSTATION.
6. REFER TO THE GBR TEXT FOR DETAILED DESCRIPTIONS OF GEOLOGIC FORMATIONS.
7. REFER TO GDR FOR BORING LOGS FOR DETAILED DESCRIPTIONS OF SOIL SAMPLES AND ROCK CORES.

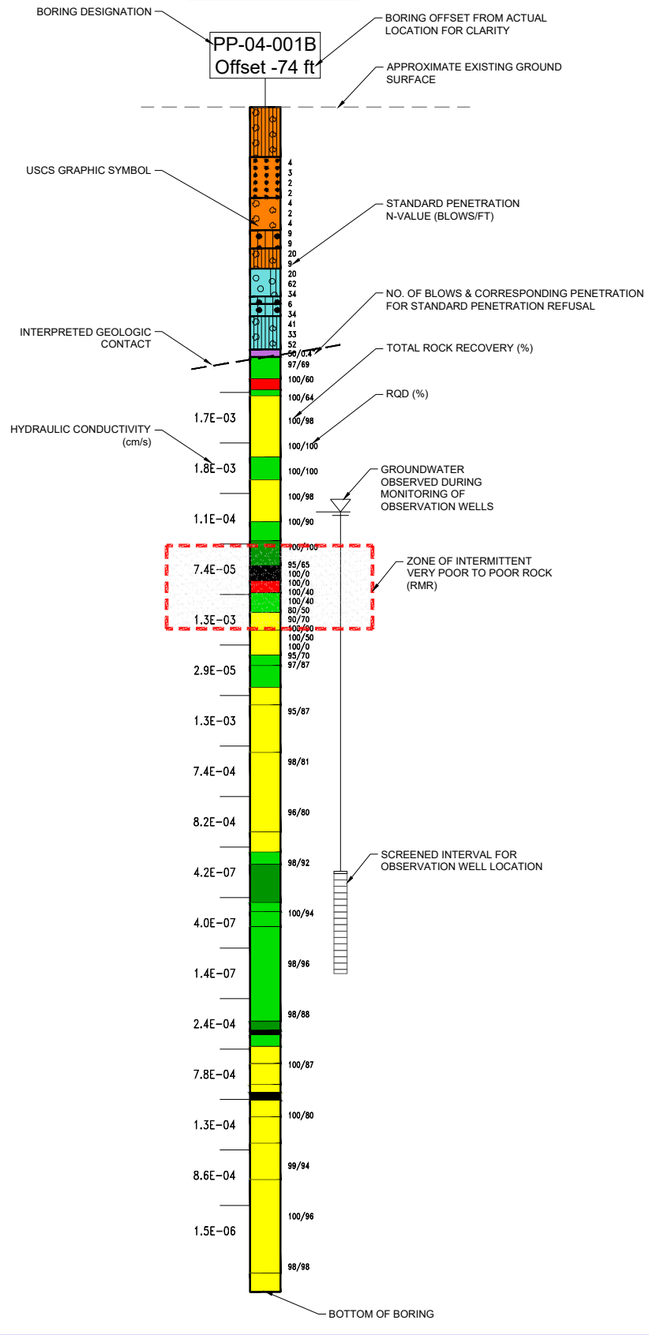
BORING SYMBOLS



GEOLOGIC FORMATIONS



BORING LOG LEGEND



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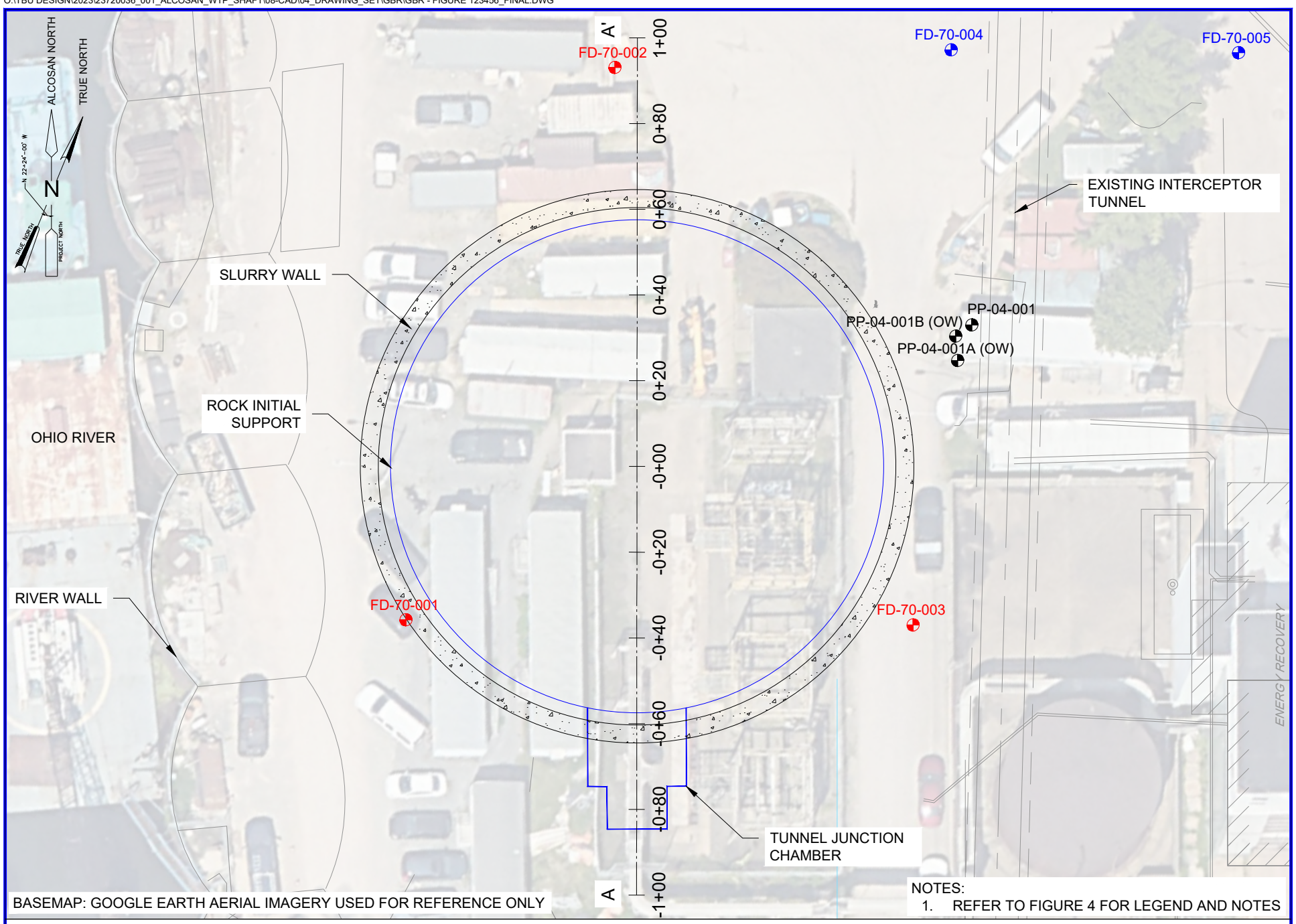
ALCOSAN WET WEATHER PUMP STATION
GENERAL LEGEND AND
NOTES FOR SUBSURFACE PROFILES

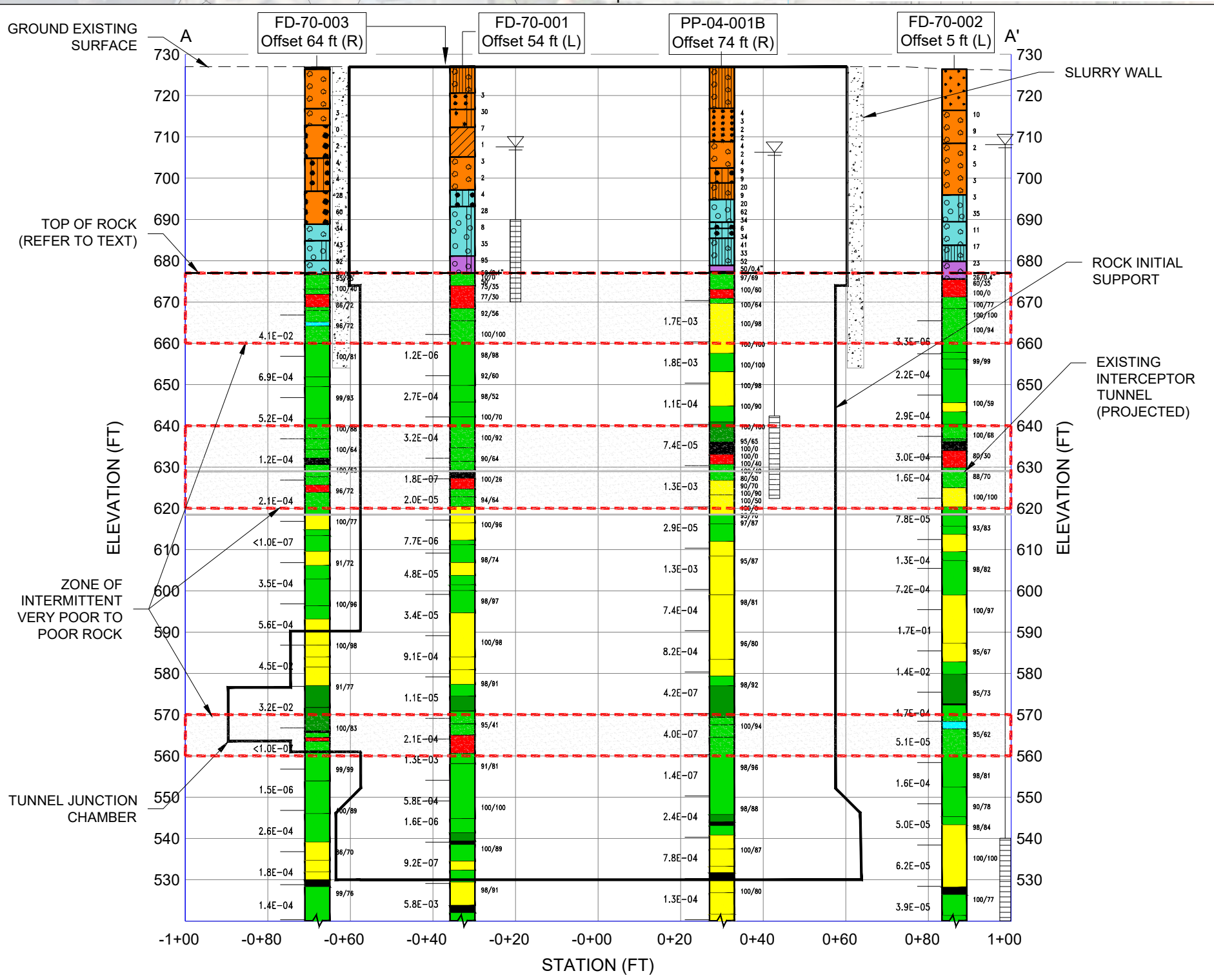
FIGURE 5

O:\TBU DESIGN\2023\23720036_001_ALCOSAN_WTP_SHAFT\08-CAD\04_DRAWING_SET\GBR\GBR - FIGURE 123456_FINAL.DWG



BASEMAP: GOOGLE EARTH AERIAL IMAGERY USED FOR REFERENCE ONLY

NOTES:
1. REFER TO FIGURE 4 FOR LEGEND AND NOTES



0 30 60

SCALE: 1" = 30'

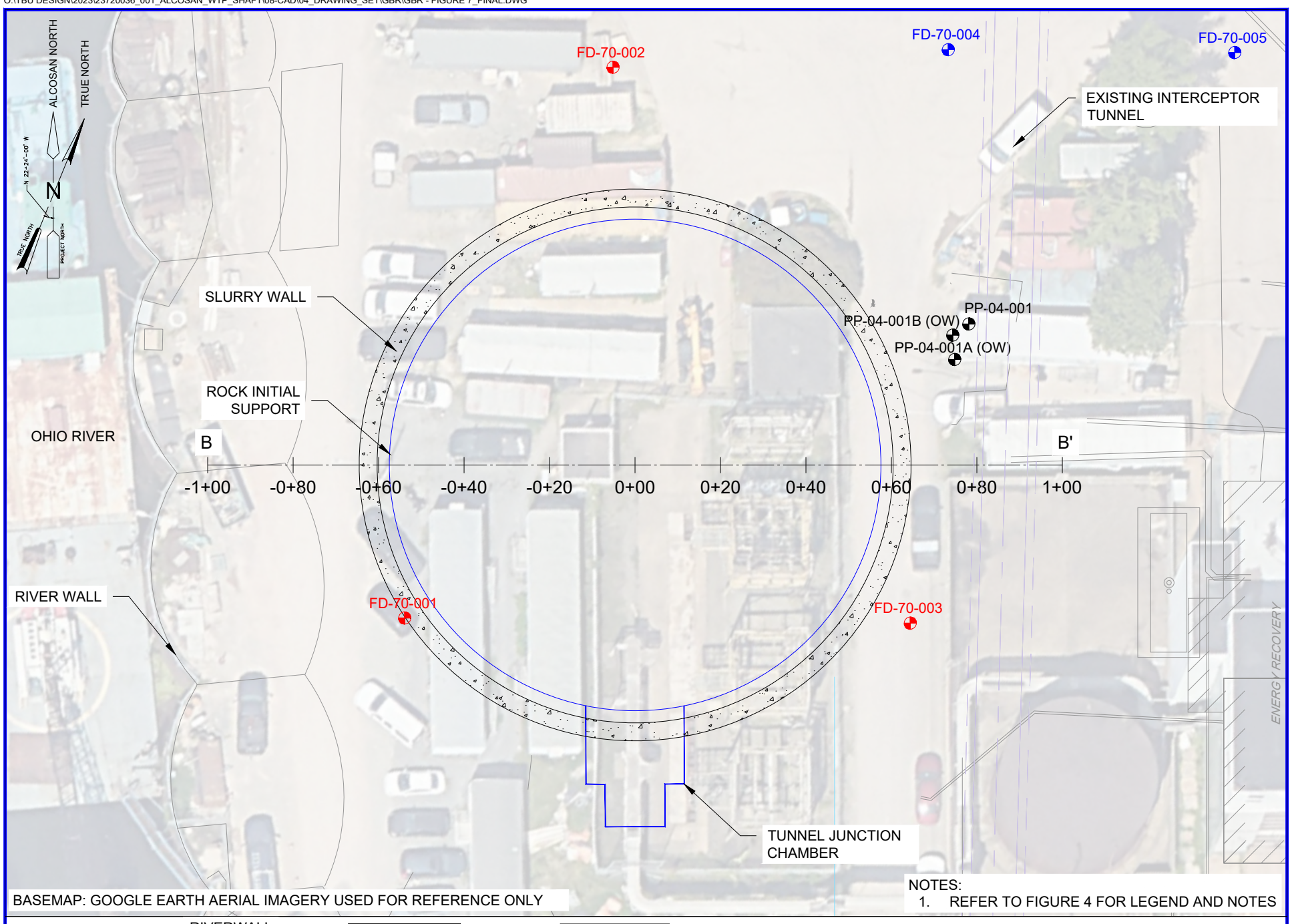
Schnabel ENGINEERING

ALCOSAN WET WEATHER PUMP STATION
PLAN & SUBSURFACE PROFILE
SECTION A-A'

FIGURE 6

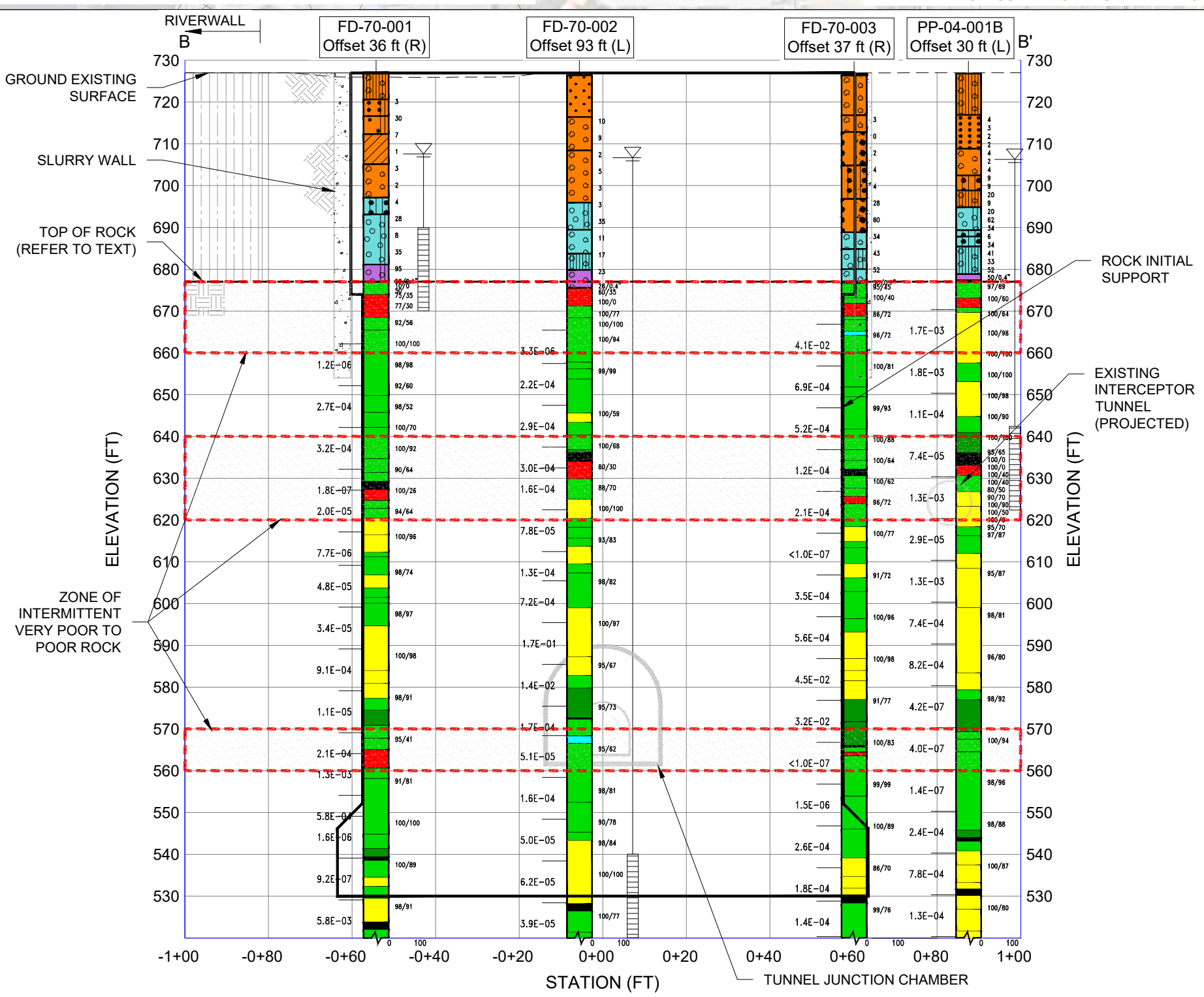
GASPIRAS 1/30/2025 1:50:19 PM

O:\TBU DESIGN\2023\23720036_001_ALCOSAN_WTP_SHAFT\08-CAD\04_DRAWING_SET\GBR\GBR - FIGURE 7_FINAL.DWG



BASEMAP: GOOGLE EARTH AERIAL IMAGERY USED FOR REFERENCE ONLY

NOTES:
1. REFER TO FIGURE 4 FOR LEGEND AND NOTES



0 30 60

SCALE: 1" = 30'

Schnabel ENGINEERING

ALCOSAN WET WEATHER PUMP STATION
PLAN & SUBSURFACE PROFILE
SECTION B-B'

FIGURE 7

GASPIRAS 1/30/2025 1:59:14 PM

Appendix A: Glossary and Abbreviations

Appendix A.1 Glossary

Abrasion/Abrasive:	Wearing, grinding, or rubbing away by friction.
Alluvium:	A general term for soil deposited during comparatively recent geologic time by a stream or other body of running water.
Argillaceous:	Pertaining to a sedimentary rock which contains an appreciable amount of clay.
Atterberg Limits:	Index test results expressed in percent water content that describe soil consistency from liquid through the plastic range to semi-solid.
Bed/Bedding:	The arrangement of soil and rock in layers of varying thickness and character.
Boulder:	A naturally occurring piece of rock with minimum dimension of 12 inches or greater in size.
Calcareous:	Refers to rock containing calcite; in particular, rock in which grains are cemented with calcite.
Carbonaceous:	Rock or soil which is rich in carbon or organic matter.
Cobble:	A naturally occurring piece of rock with dimension greater than 3 inches and less than 12 inches in size.
Consistency:	The degree of cohesion between soil particles as related to the strength of the soil. Described in terms of soft, stiff, or hard.
Cover:	Perpendicular distance to nearest ground surface from tunnel crown.
Cross-bedded:	A sedimentary structure in which relatively thin layers are deposited at an inclined angle to the main bedding; formed by wind or water.
Dendritic:	A drainage pattern of a stream and its tributaries in a treelike shape.
Dewatering:	The removal of groundwater to reduce the flow rate or reduce the head. Dewatering is usually done to improve conditions in excavations and to facilitate construction work.
Discontinuity:	A structural break in geological materials (e.g. fractures, joints, faults).
Fill:	Material used to raise the level of a low area or to make an embankment.
Groundwater:	Water that infiltrates into the earth and is stored in the soil and rock within the zone of saturation below the earth's surface.
Hydraulic Conductivity:	The potential rate of groundwater flow through a unit area of saturated soil or rock under a unit hydraulic gradient, measured at right angles to the groundwater flow direction.
Interbedded:	A bed of one kind of soil or rock material occurring between or alternating with beds of another kind.
Invert:	The lowest point of the internal cross section of a pipe or of a channel.
Lamination:	Sedimentary layering that is thinner and less distinct than bedding.

Liquid Limit (LL):	The upper bound of the range of water contents over which soil exhibits plastic behavior. Above this point the soil will exhibit liquid behavior.
Nodule:	A small, irregular, surfaced rock body that differs in composition from the rock that surrounds it; formed by the replacement of the original mineral matter.
Obstruction:	A cobble, boulder, and/or man-made object encountered in Soil Units that is of such a volume and hardness that requires extraordinary effort for removal and disposal. Extraordinary effort includes the employment of special tools and/or procedures as necessary, including drilling, excavating, coring through, or otherwise removing, breaking up, or pushing aside any objects preventing or impeding the construction of the panel trench.
Permeability:	The capacity of a rock or soil to transmit liquid or gas.
Plasticity Index (PI):	Derived result from Atterberg Limits test that is a measure of the plasticity of a soil. The size of the range of water contents where the soil exhibits plastic properties.
Plastic Limit (PL):	The lower bound of the range of water contents over which soil exhibits plastic behavior. Below this point the soil will exhibit semi-solid behavior.
Residuum:	Residual soil formed in place by weathering of the underlying rock on which it lies; no relict rock structure is present.
Rippling:	A ridged sedimentary structure formed in response to water or wind flowing along a layer of deposited settlement.
Seam:	A thin layer or stratum separating two distinct layers of different composition.
Slickenside:	Polished striated rock surfaces caused by one rock mass moving across another on a fault.
Slurry Wall:	A construction method used to construct a structural or low permeability wall-in-place below the ground surface. As a trench is excavated, it is filled with bentonite (an absorbent clay) slurry. This fluid mixture allows the excavation to continue while preventing the passage of groundwater or the collapse of the trench walls. The trench is later backfilled with concrete and reinforcing steel. Also known as a “diaphragm wall.”
Strata:	The plural of stratum; soil or rock mass with similar characteristics and/or geologic origin.
Stoppage:	Obstruction within the slurry wall panel excavation that reduces the excavation rate to less than 6 vertical inches over a 4-hour period and requires the employment of special tools and/or excavation techniques and procedures, including drilling, excavating, or coring, to remove, break up or push aside the obstruction.
Stringer:	A mineral veinlet or filament occurring in a discontinuous subparallel pattern in host rock.
Topography:	The shape of the Earth’s surface, above and below sea level, the set of landforms in a region, or the distribution of elevations.

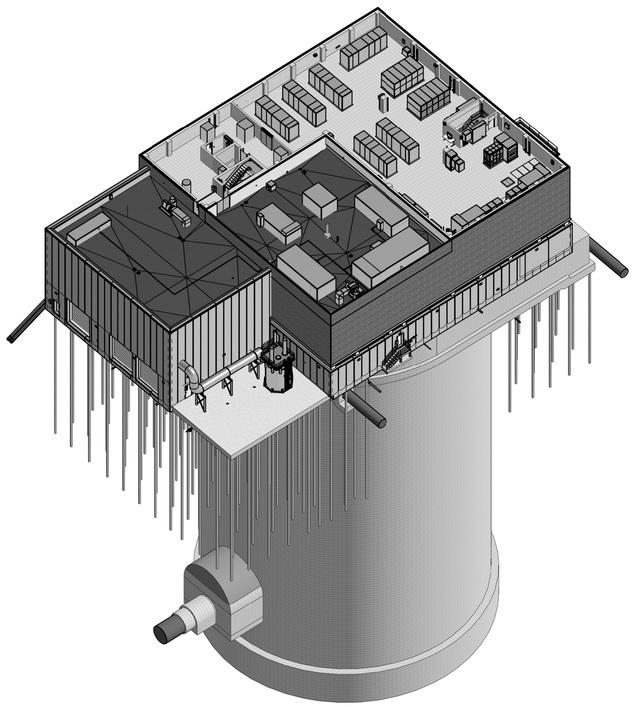
Vein:	A fracture that has been filled with mineral material (e.g., quartz, calcite)

Appendix A.2 Abbreviations

ALCOSAN	Allegheny County Sanitary Authority
cm/sec	centimeters per second
DSC	Differing Site Condition
Elev.	Elevation
ft	feet
GBR	Geotechnical Baseline Report
GDR	Geotechnical Data Report
gpm	gallons per minute
LEL	Lower Explosive Limit
MGD	million gallons per day
NSC	North Shore Connector
OSHA	Occupational Safety and Health Administration
pcf	pounds per cubic foot
psi	pounds per square inch
RMR	Rock Mass Rating
UCS	Unconfined Compressive Strength
USCS	Unified Soil Classification System
WWP	Wet Weather Plan
WWPS	Wet Weather Pump Station

ATTACHMENT – C

Addendum No. 6 Drawings



KEYNOTES:

1. CONCRETE STAIR AND LANDING. REFERENCE STRUCTURAL DRAWINGS.
2. FREE-STANDING BALLASTED PIPE STEP OVER - COORDINATE HEIGHT WITH MEP

N

MATCHLINE
SEE DWG 430-A-08

ELECTRICAL ROOM
602

ELEV CONTROL RM
603

HVAC AREA
601

ELEVATOR
E01

DN
STAIR 1
S01

UP

DN

LENGTH OF BRICK SCREEN TERMINATES AT LOWEST STRUCTURAL SUPPORT
REFERENCE 3 ON 430-A-28

1 / 12" LP

1/4" / 12"

1/2" / 12"

HP

6' - 8"

36' - 5"

1 430-A-21
2 430-A-21
7 430-A-32
3 430-A-34
1 430-A-22
4 430-A-19
8 430-A-12
1 430-A-27

602A
603A
601A
604A
S01A

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

ELECTRICAL AND HVAC ROOM FLOOR PLAN - SOUTH

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

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

Brown AND Caldwell

evolve environment::architecture

Signer Name: Christine Mondor
Signing Reason: I approved this document.
Signing Time: 2025-07-29 16:49:16(EDT)

REGISTERED ARCHITECT PENNSYLVANIA CHRISTINE MONDOR No. RA013527

ARLETTA SCOTT WILLIAMS
EXECUTIVE DIRECTOR, ALCOSAN

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ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-A-09
ELECTRICAL AND HVAC FLOOR PLAN SOUTH

Contract: 1800
CAD File Name:
Date: 5/16/2025
Sheet: 60 of 405

Plot Date: 7/29/2025 11:51:03 AM Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt

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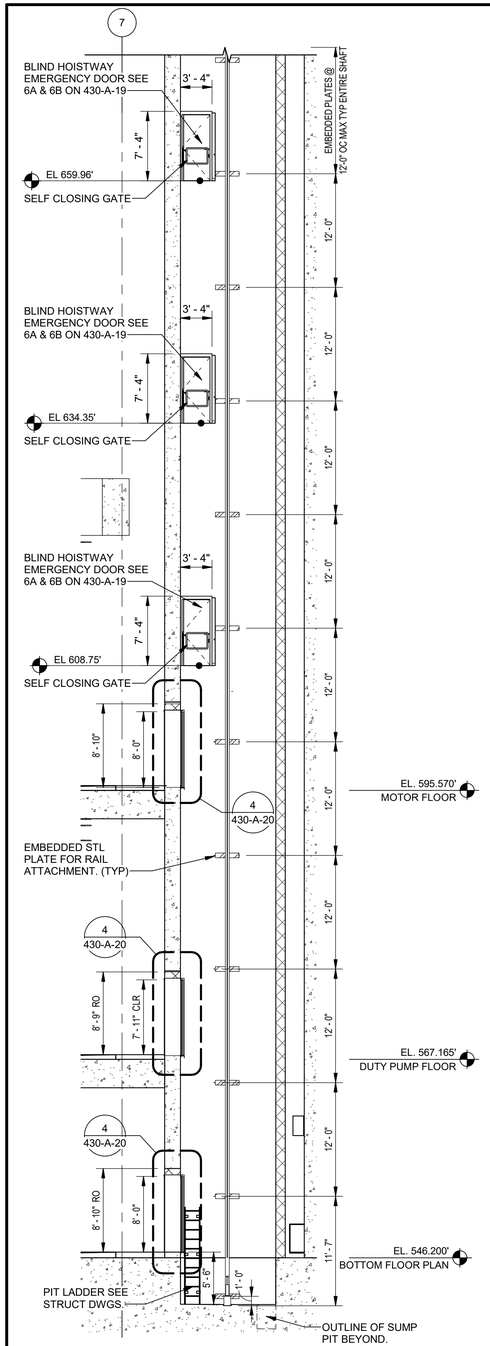
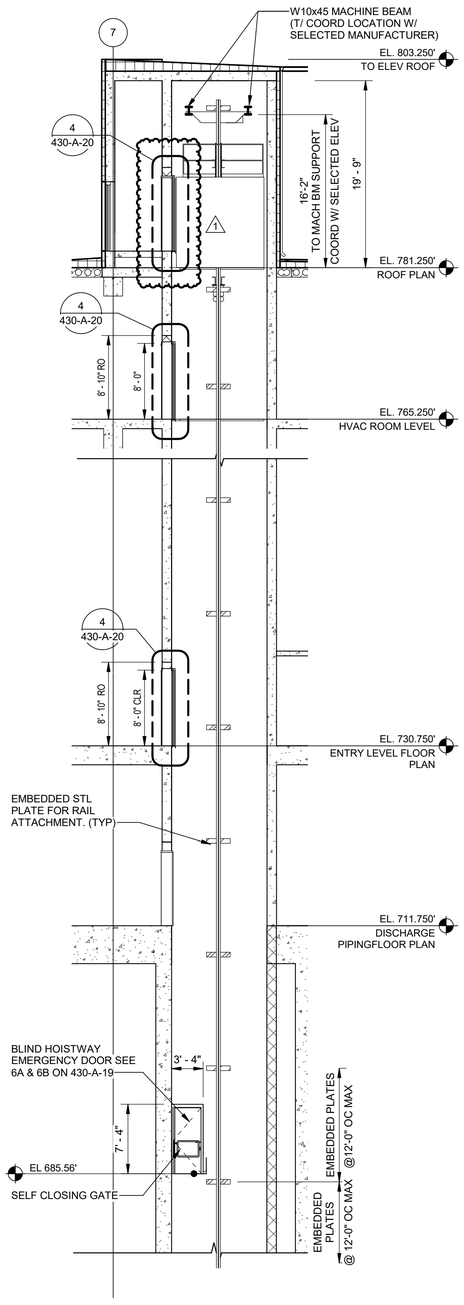


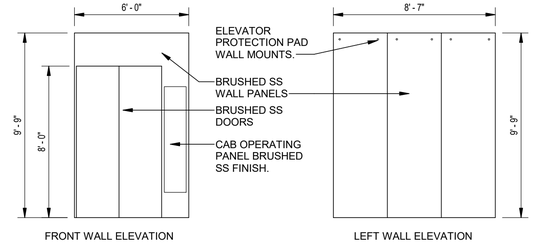
1A ELEVATOR SECTION

430-A-19 SCALE: 1/8" = 1'-0"



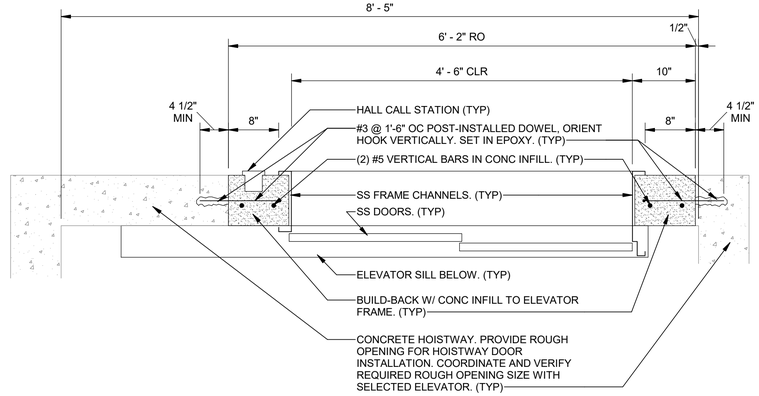
1B ELEVATOR SECTION - CONTINUATION

430-A-19 SCALE: 1/8" = 1'-0"

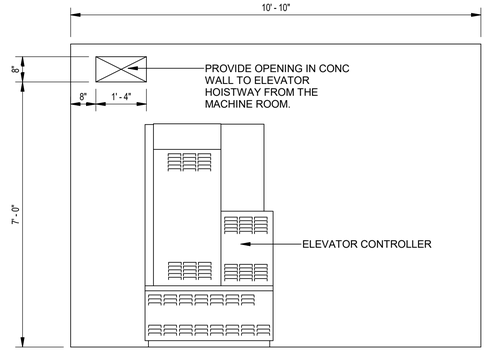


2 ELEVATOR CAB INTERIORS

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

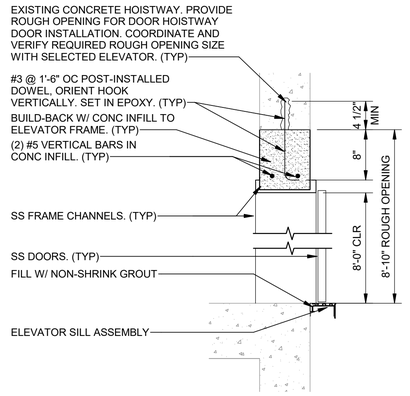


HOISTWAY DOOR PLAN DETAIL



3 ELEVATOR MACHINE ROOM ELEVATION

430-A-19 SCALE: 1/2" = 1'-0"



HOISTWAY DOOR SECTION DETAIL

4 HOISTWAY DOOR DETAILS

430-A-19 SCALE: 1" = 1'-0"

SCALE : 1" = 1'-0"

SCALE : 1/2 = 1'-0"

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

SCALE : 3/8" = 1'-0"

Designed by:	REVISION			
E.BURDWOOD	REV No.	DATE	DESCRIPTION	APPV
Drawn by:	0	5/16/25	ISSUE FOR BID	CKM
M.PARKS	1	07/31/25	ADD. 6 - REVISED DETAILS, NOTES, & FINISH SCHEDULE	CKM
Checked by:				
D.WALDROP				

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Signer Name: Christine Mondor
Signing Reason: I approved this document.
Signing Time: 2025-07-29 16:49:16(EDT)

REGISTERED ARCHITECT PENNSYLVANIA CHRISTINE MONDOR No. RA015377 10 JULY 2025

alcosan allegheny county sanitary authority

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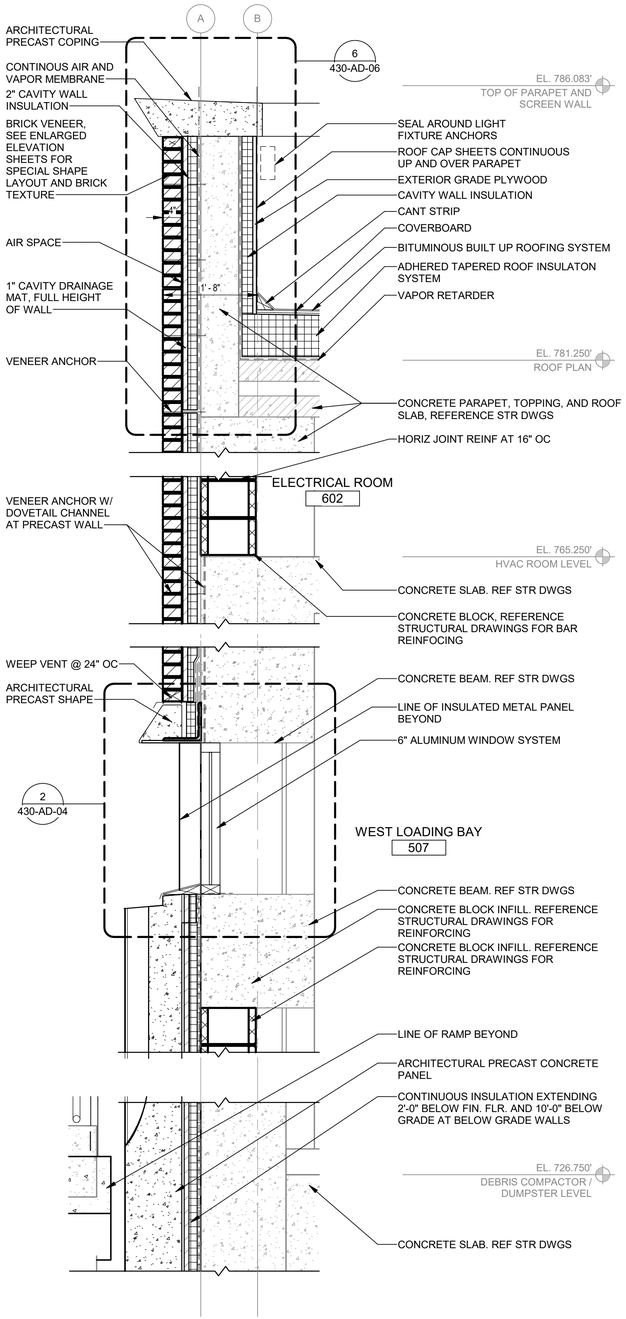
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-A-20
ELEVATOR SECTIONS AND DETAILS

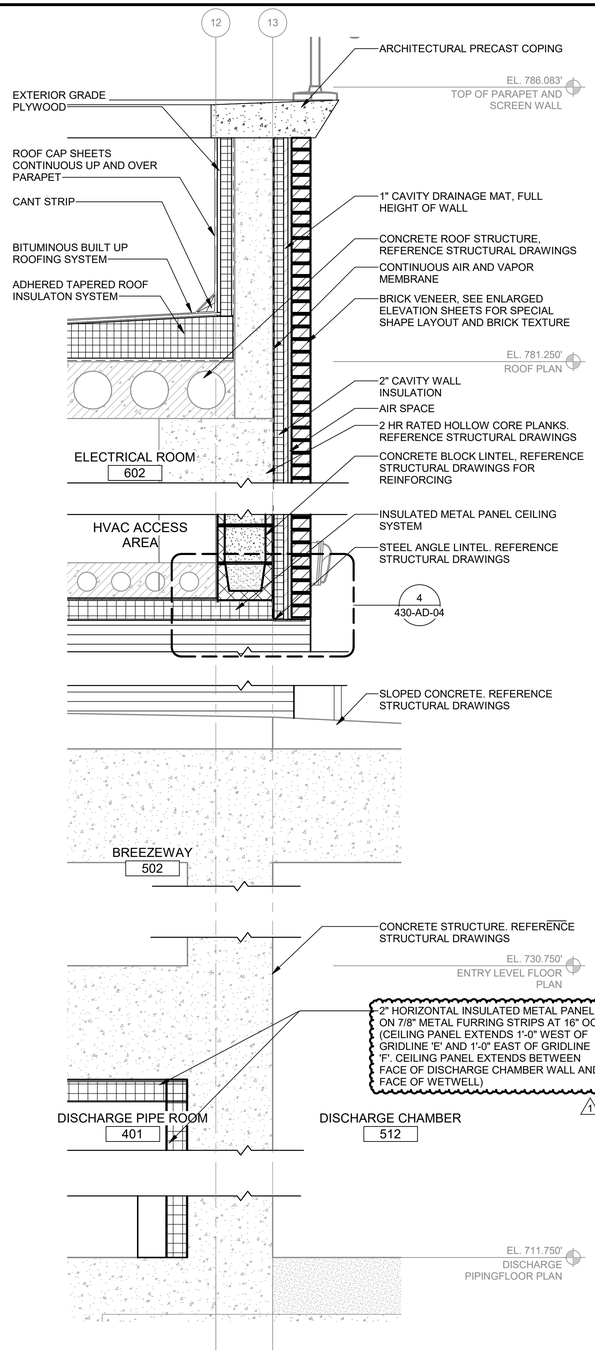
Contract: 1800
CAD File Name:
Date: 5/16/2025
Sheet: 71 of 405

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

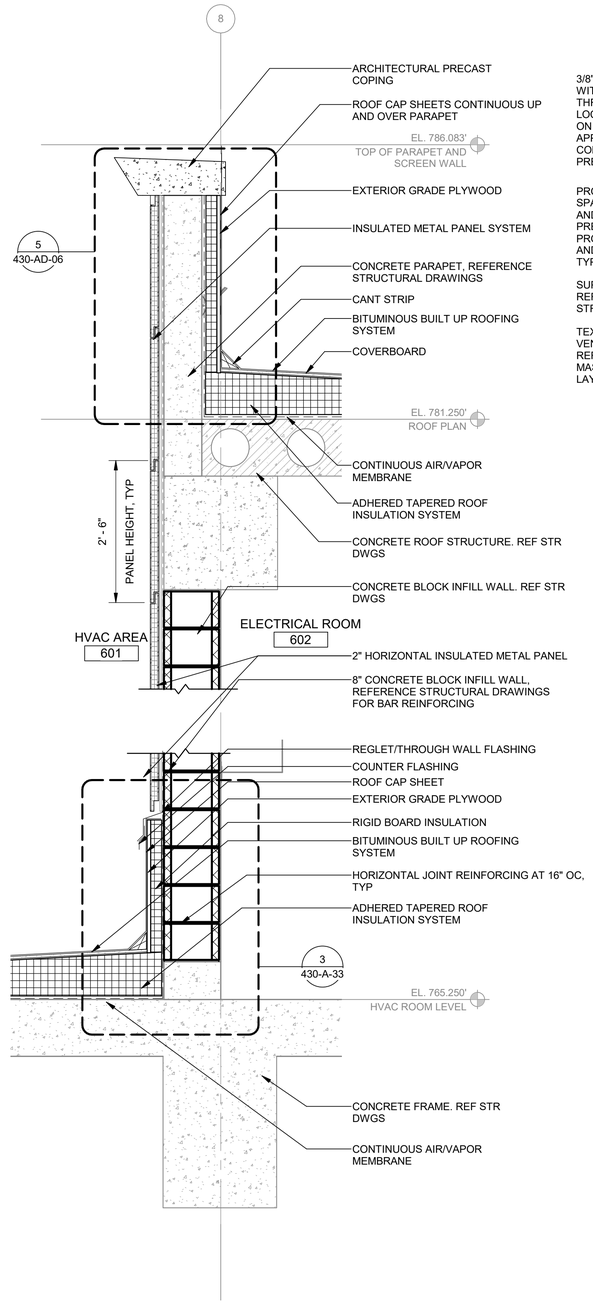
Plot Date: 7/29/2025 11:51:24 AM



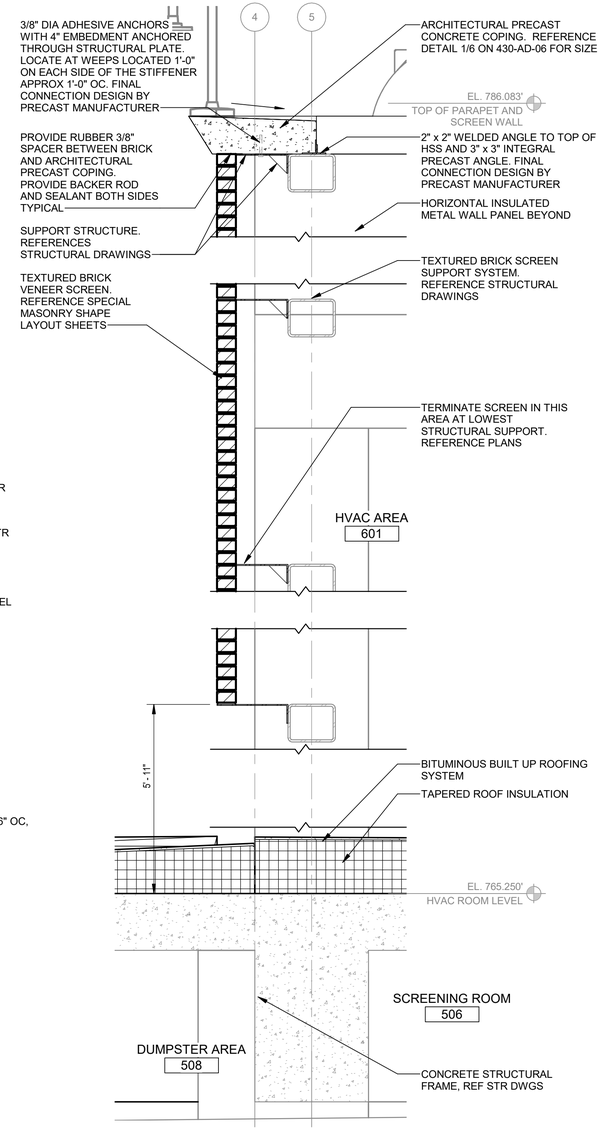
1 WALL SECTION
1
430-A-26



2 WALL SECTION
2
430-A-23



3 WALL SECTION
3
430-A-23



4 WALL SECTION
4
430-A-23

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

Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt
Plot Date: 7/29/2025 11:51:37 AM

Designed by:	REVISION			
M.CONTI	REV No.	DATE	DESCRIPTION	APPV
Drawn by:	0	5/16/25	ISSUE FOR BID	CKM
S.GRAMKOW	1	07/31/25	ADD. 6 - REVISED DETAILS, NOTES, & FINISH SCHEDULE	CKM
Checked by:				
D.WALDROP				

Brown AND Caldwell

evolve environment :: architecture

Signer Name: Christine Mondor
Signing Reason: I approved this document
Signing Time: 2025-07-29 16:49:36(EDT)

REGISTERED ARCHITECT COMMONWEALTH OF PENNSYLVANIA CHRISTINE MONDOR No. 64801 STATE 2025

ARLETTA SCOTT WILLIAMS
EXECUTIVE DIRECTOR, ALCOSAN

3300 PREBLE AVE.
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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

DOOR SCHEDULE

NUMBER	DOOR W	DOOR HT	DOOR TYPE	DOOR MAT'L	FRAME W	FRAME HT	FRAME THK	FRAME MAT'L	FRAME TYPE	GLAZING	FINISH	DOOR SECURITY	HARDWARE SET	DETAIL HEAD	DETAIL JAMB	DETAIL SILL	FIRE RATING	REMARKS
BOTTOM FLOOR PLAN																		
S01A	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/FPG	PT	NONE	2	5/430-AD-03	5/430-AD-03	5/430-AD-03	90 MIN	
S02A	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/FPG	PT	NONE	2	5/430-AD-03	5/430-AD-03	5/430-AD-03	90 MIN	
DUTY PUMP FLOOR																		
S01B	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/FPG	PT	NONE	2	5/430-AD-03	5/430-AD-03	5/430-AD-03	90 MIN	
S02B	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/FPG	PT	NONE	2	5/430-AD-03	5/430-AD-03	5/430-AD-03	90 MIN	
MOTOR FLOOR																		
S10H	3'-0"	7' - 0"	F	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	3" SR	NONE	PT	NONE	12	1/430-AD-02	1/430-AD-02	1/430-AD-02	90 MIN	REFERENCE DETAIL 6A/6B ON 430-A-19
S01C	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/FPG	PT	NONE	2	5/430-AD-03	5/430-AD-03	5/430-AD-03	90 MIN	
S02C	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/IG	PT	NONE	2	5/430-AD-03	5/430-AD-03	5/430-AD-03	90 MIN	
INTERMEDIATE CRANE SUPPORT FRAMING																		
S10E	3'-0"	7' - 0"	F	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	3" SR	NONE	PT	NONE	12	1/430-AD-02	1/430-AD-02	1/430-AD-02	90 MIN	REFERENCE DETAIL 6A/6B ON 430-A-19
S10G	3'-0"	7' - 0"	F	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	3" SR	NONE	PT	NONE	12	1/430-AD-02	1/430-AD-02	1/430-AD-02	90 MIN	REFERENCE DETAIL 6A/6B ON 430-A-19
LANDING "L23"																		
S10F	3'-0"	7' - 0"	F	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	3" SR	NONE	PT	NONE	12	1/430-AD-02	1/430-AD-02	1/430-AD-02	90 MIN	REFERENCE DETAIL 6A/6B ON 430-A-19
DISCHARGE PIPINGFLOOR PLAN																		
S01D	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/FPG	PT	NONE	2	5/430-AD-03	5/430-AD-03	5/430-AD-03	90 MIN	
S02D	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/FPG	PT	NONE	2	5/430-AD-03	5/430-AD-03	5/430-AD-03	90 MIN	
S03A	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/FPG	PT	NONE	2	4/430-AD-03	4/430-AD-03	4/430-AD-03	90 MIN	
DEBRIS COMPACTOR / DUMPSTER LEVEL																		
507A	14'-0"	14' - 0"	OH	AL	14' - 0"	14' - 0"	MFG	AL	MFG	NONE	AN	CT	13	4/430-AD-02	5/430-AD-02	6/430-AD-02	NONE	MOTOR OPERATED
508B	14'-0"	14' - 0"	OH	AL	14' - 0"	14' - 0"	MFG	AL	MFG	NONE	AN	CT	13	5/430-AD-02	5/430-AD-02	5/430-AD-02	NONE	MOTOR OPERATED - NEMA 7
508C	14'-0"	14' - 0"	OH	AL	14' - 0"	14' - 0"	MFG	AL	MFG	NONE	AN	CT	13	5/430-AD-02	5/430-AD-02	5/430-AD-02	NONE	MOTOR OPERATED - NEMA 7
509A	14'-0"	14' - 0"	OH	AL	14' - 0"	14' - 0"	MFG	AL	MFG	NONE	AN	CT	13	4/430-AD-02	5/430-AD-02	6/430-AD-02	NONE	MOTOR OPERATED
510A	14'-0"	14' - 0"	OH	AL	14' - 0"	14' - 0"	MFG	AL	MFG	NONE	AN	CT	13	5/430-AD-02	5/430-AD-02	5/430-AD-02	NONE	MOTOR OPERATED - NEMA 7
510B	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/IG	PT	NONE	3	3/430-AD-03	3/430-AD-03	7/430-AD-02	NONE	
510C	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/IG	PT	NONE	3	3/430-AD-03	3/430-AD-03	7/430-AD-02	NONE	
ENTRY LEVEL FLOOR PLAN																		
501A	(2) 3'-2"	7' - 0"	DNG	HM	6' - 8"	7' - 4"	H - 4" / J - 2"	HM	6" DED	TG/IG	PT	NONE	6	2/430-AD-03	2/430-AD-03	2/430-AD-03	NONE	
502A	(2) 3'-2"	7' - 0"	DNG	HM	6' - 8"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/IG/FPG	PT	NONE	7	1/430-AD-03	1/430-AD-03	1/430-AD-03	90 MIN	LEFT LEAF INACTIVE, CLOSEST TO STAIR
502B	(2) 3'-2"	7' - 0"	DNG	HM	6' - 8"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/IG/FPG	PT	NONE	7	1/430-AD-03	1/430-AD-03	1/430-AD-03	90 MIN	RIGHT LEAF INACTIVE, CLOSEST TO STAIR
502C	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/IG/FPG	PT	NONE	4	1/430-AD-03	1/430-AD-03	1/430-AD-03	90 MIN	
503A	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/IG	PT	NONE	3	2/430-AD-03	2/430-AD-03	2/430-AD-03	NONE	
504A	3'-0"	7' - 0"	F	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	NONE	PT	NONE	8	4/430-AD-03	4/430-AD-03	4/430-AD-03	NONE	OVERLAP CONCRETE BLOCK JOINT WITH FRAME
505A	3'-0"	7' - 0"	F	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	NONE	PT	NONE	9	4/430-AD-03	4/430-AD-03	4/430-AD-03	NONE	OVERLAP CONCRETE BLOCK JOINT WITH FRAME
508A	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/IG	PT	NONE	3	3/430-AD-03	3/430-AD-03	3/430-AD-03	90 MIN	COORD LOCATION OF DOOR IN PRECAST/CMU WITH SLAB SLOPE
S01E	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/FPG	PT	NONE	2	4/430-AD-03	4/430-AD-03	4/430-AD-03	90 MIN	
S01F	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/IG/FPG	PT	NONE	4	2/430-AD-03	2/430-AD-03	2/430-AD-03	90 MIN	
S02E	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/FPG	PT	NONE	2	4/430-AD-03	4/430-AD-03	4/430-AD-03	90 MIN	
S02F	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/IG/FPG	PT	NONE	4	2/430-AD-03	2/430-AD-03	6/430-AD-03	90 MIN	
S03B	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/IG/FPG	PT	NONE	4	1/430-AD-03	1/430-AD-03	1/430-AD-03	90 MIN	
S03C	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/FPG	PT	NONE	2	4/430-AD-03	4/430-AD-03	4/430-AD-03	90 MIN	
HVAC ROOM LEVEL																		
601A	(2) 3'-2"	7' - 0"	DNG	HM	6' - 8"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/IG	PT	NONE	11	1/430-AD-03	1/430-AD-03	11/430-AD-02	NONE	SIMILAR SILL CONDITION
602A	(2) 3'-2"	7' - 0"	DNG	HM	6' - 8"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/FPG	PT	NONE	5	4/430-AD-03	4/430-AD-03	4/430-AD-03	90 MIN	
603A	3'-0"	7' - 0"	F	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	NONE	PT	NONE	1	4/430-AD-03	4/430-AD-03	4/430-AD-03	90 MIN	
604A	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/IG	PT	NONE	10	11/430-AD-02	11/430-AD-02	11/430-AD-02	NONE	
S01G	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/FPG	PT	NONE	2	4/430-AD-03	4/430-AD-03	4/430-AD-03	90 MIN	
S03D	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	H - 4" / J - 2"	HM	6" DR	TG/FPG	PT	NONE	1	4/430-AD-03	4/430-AD-03	4/430-AD-03	90 MIN	
ROOF PLAN																		
S01H	3'-0"	7' - 0"	NG	HM	3' - 4"	7' - 4"	2"	HM	6" DR	TG/IG/FPG	PT	NONE	10	1/430-AD-03	1/430-AD-03	11/430-AD-02	90 MIN	SIMILAR DETAIL, REPLACE CMU WITH CONCRETE
S02O	3'-0"	7' - 0"	NG	HM	4' - 4"	7' - 4"	2"	HM	6" DR	TG/IG/FPG	PT	NONE	10	1/430-AD-03	1/430-AD-03	11/430-AD-02	90 MIN	SIMILAR DETAIL, REPLACE CMU WITH CONCRETE

GENERAL DOOR NOTES:
1. PROVIDE ALL EXTERIOR AND INTERIOR WINDOWS WITH CLEAR, TEMPERED, INSULATION FLOAT GLASS UNITS 1" THICK (EXTERIOR WINDOWS TINTED), UNLESS OTHERWISE NOTED.
2. ALL DOORS TO BE INSULATED AS PER ENERGY CODE REQUIREMENTS.
3. COORDINATE FINAL COLOR SELECTION WITH OWNER

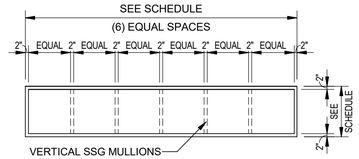
WINDOW SCHEDULE

MARK	TYPE	WIDTH	HEIGHT	GLAZING TYPE	FRAME	VERTICAL MULLION	HEAD DETAIL	JAMB DETAIL	SILL DETAIL	SILL HEIGHT	COMMENTS
W1	C	12' - 0"	2' - 8"	TEMPERED GLASS	ALUMINUM	ALUMINUM	2/430-AD-04	2/430-AD-04	2/430-AD-04	+10'-0"	
W2	C	13' - 0"	2' - 8"	TEMPERED GLASS	ALUMINUM	ALUMINUM	2/430-AD-04	2/430-AD-04	2/430-AD-04	+10'-0"	
W3	C	13' - 6"	2' - 8"	TEMPERED GLASS	ALUMINUM	ALUMINUM	2/430-AD-04	2/430-AD-04	2/430-AD-04	+10'-0"	
W4	C	12' - 6"	2' - 8"	TEMPERED GLASS	ALUMINUM	ALUMINUM	2/430-AD-04	2/430-AD-04	2/430-AD-04	+10'-0"	
W5	E	23' - 6"	2' - 8"	TEMPERED GLASS	ALUMINUM	ALUMINUM	2/430-AD-04	2/430-AD-04	2/430-AD-04	+10'-0"	
W6	E	22' - 9"	2' - 8"	TEMPERED GLASS	ALUMINUM	ALUMINUM	2/430-AD-04	2/430-AD-04	2/430-AD-04	+10'-0"	
W7	B	10' - 3"	2' - 8"	TEMPERED GLASS	ALUMINUM	ALUMINUM	2/430-AD-04	2/430-AD-04	2/430-AD-04	+10'-0"	
W8	C	12' - 0"	2' - 8"	TEMPERED GLASS	ALUMINUM	ALUMINUM	2/430-AD-04	2/430-AD-04	2/430-AD-04	+10'-0"	
W9	C	13' - 0"	2' - 8"	TEMPERED GLASS	ALUMINUM	ALUMINUM	2/430-AD-04	2/430-AD-04	2/430-AD-04	+10'-0"	
W10	C	13' - 6"	2' - 8"	TEMPERED GLASS	ALUMINUM	ALUMINUM	2/430-AD-04	2/430-AD-04	2/430-AD-04	+10'-0"	
W11	C	12' - 6"	2' - 8"	TEMPERED GLASS	ALUMINUM	ALUMINUM	2/430-AD-04	2/430-AD-04	2/430-AD-04	+10'-0"	
W12	E	23' - 6"	2' - 8"	TEMPERED GLASS	ALUMINUM	ALUMINUM	2/430-AD-04	2/430-AD-04	2/430-AD-04	+10'-0"	
W13	A	5' - 0"	2' - 8"	TEMPERED GLASS	ALUMINUM	ALUMINUM	2/430-AD-04	2/430-AD-04	2/430-AD-04	+10'-0"	
W14	D	15' - 7"	2' - 8"	TEMPERED GLASS	ALUMINUM	ALUMINUM	2/430-AD-04	2/430-AD-04	2/430-AD-04	+10'-0"	
W15	B	10' - 3"	2' - 8"	TEMPERED GLASS	ALUMINUM	ALUMINUM	2/430-AD-04	2/430-AD-04	2/430-AD-04	+10'-0"	

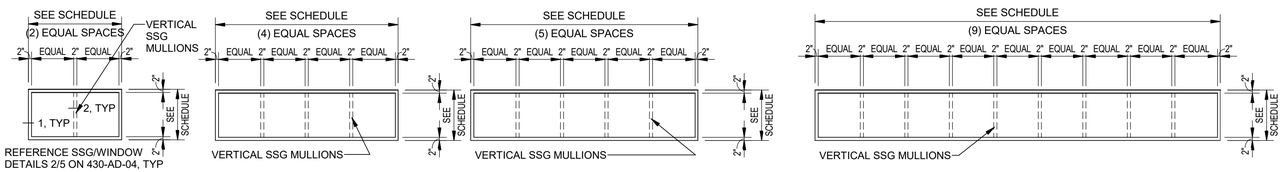
GENERAL WINDOW NOTES:
1. PROVIDE ALL EXTERIOR AND INTERIOR WINDOWS WITH CLEAR, TEMPERED, INSULATION FLOAT GLASS UNITS 1" THICK (EXTERIOR WINDOWS TINTED), UNLESS OTHERWISE NOTED.
2. ALL WINDOWS TO BE INSULATED AS PER ENERGY CODE REQUIREMENTS.
3. PROVIDE METAL SILL PAN WITH END DAMS AT EACH EXTERIOR WINDOW/STOREFRONT ASSEMBLY, WITH CONTINOUS BACKER ROD AND SEALANT

DOOR LEGEND

VP	VISION PANEL	HL	HALF-LIGHT	MFR	MANUFACTURER
FG	FIRE GLASS	HM	HOLLOW METAL DOOR AND FRAME	TG	TEMPERED GLASS
AL	ALUMINUM	IG	INSULATED GLASS	CR	CARD READER
SR	SINGLE RABBIT FRAME	DR	DOUBLE RABBIT FRAME	DED	DOUBLE EGRESS DOOR FRAME



WINDOW TYPE D



WINDOW TYPE A | WINDOW TYPE B | WINDOW TYPE C | WINDOW TYPE E

ROOM FINISH SCHEDULE

NUMBER	ROOM NAME	FLOOR MATERIAL	FLOOR COLOR	BASE FINISH	NORTH MATERIAL	NORTH FINISH	EAST MATERIAL	EAST FINISH	SOUTH MATERIAL	SOUTH FINISH	WEST MATERIAL	WEST FINISH	CEILING MATERIAL	CEILING HEIGHT	REMARKS
Not Placed															
514	CONTROL ROOM														
BOTTOM FLOOR PLAN															
101	BOTTOM FLOOR	CONC-S	C	CONC-W	CONC-W	PT/ NOTE 1	CONC-W	PT / NOTE 1	CONC-W	PT / NOTE 1	CONC-W	PT / NOTE 1	CONC	10' - 4"	
E01	ELEVATOR	CONC-S	C	CONC-W	CONC-W	N	CONC-W	N	CONC-W	N	CONC-W	N	CONC	243' - 0"	
S01	STAIR 1	CONC-S	C	CONC-W	CONC-W	PT/ NOTE 2	CONC-W	PT / NOTE 2	CONC-W	PT / NOTE 2	CONC-W	PT / NOTE 2	CONC	244' - 0"	
S02	STAIR 2	CONC-S	C	CONC-W	CONC-W	PT/ NOTE 2	CONC-W	PT / NOTE 2	CONC-W	PT / NOTE 2	CONC-W	PT / NOTE 2	CONC	195' - 0"	
DUTY PUMP FLOOR															
201	DUTY PUMP FLOOR	CONC-S	N	CMU	CONC-W	PT/ NOTE 1	CONC-W	PT / NOTE 1	CONC-W	PT / NOTE 1	CONC-W	PT / NOTE 1	CONC	30' - 3"	
MOTOR FLOOR															
301	MOTOR FLOOR	CONC-S	C	CONC-W	CONC-W	PT/ NOTE 1	CONC-W	PT / NOTE 1	CONC-W	PT / NOTE 1	CONC-W	PT / NOTE 1	CONC	114' - 5"	
DISCHARGE PIPINGFLOOR PLAN															
401	DISCHARGE PIPE ROOM	CONC-S	N	IMP	IMP	FF	CONC-W	N	CONC-W	N	CONC-W	N	IMP /1	17' - 0"	IMP CEILING FINISH INDICATES PARTIAL CEILING COVERAGE - REFERENCE WALL SECTION 2 ON SHEET 430-A-28 /1
S03	STAIR 3	CONC-S	N	CMU	CONC-W	PT/ NOTE 2	CMU	PT / NOTE 2	CMU	PT / NOTE 2	CMU	N	CONC	68' - 6"	
ENTRY LEVEL FLOOR PLAN															
501	PUMP LOADOUT AREA WEST	CONC-H	C	CMU-G	CMU-G	FF	CMU-G	FF	CMU-G	FF	CMU-G	FF	CONC	33' - 6"	
502	BREEZEWAY	CONC-H	C	IMP	NONE	N/A	IMP	FF	IMP	FF	IMP	FF	IMP	33' - 6"	
503	PUMP LOADOUT AREA EAST	CONC-H	C	CMU-G	CMU-G	FF	CMU-G	FF	CMU-G	FF	CMU-G	FF	CONC	33' - 6"	
504	JANITORS CLOSET	CONC-H	C	CMU-G	CONC-W	N	CONC-W	N	CMU-G	FF	CMU-G	FF	CONC	12' - 0"	
505	RESTROOM	CONC-H	C	CMU-G	CMU-G	FF	CMU-G	FF	CMU-G	FF	CMU-G	FF	CONC	12' - 0"	
506	SCREENING ROOM	CONC-H	C	CMU-G	CMU-G	N	CMU-G	N	CMU-G	N	CMU-G	N	CONC	33' - 6"	
507	WEST LOADING BAY	CONC-H	C	CONC-W	CONC-W	N	CONC-W	N	CONC-W	N	CONC-W	N	CONC	37' - 6"	
508	DUMPSTER AREA	CONC-H	C	CMU-G	CMU-G	FF	CMU-G	FF	CMU-G	FF	CMU-G	FF	CONC	36' - 6"	
509	EAST LOADING BAY	CONC-H	C	CONC-W	CONC-W	N	CONC-W	N	CONC-W	N	CONC-W	N	CONC	37' - 6"	
510	ODOR CONTROL FAN ROOM	CONC-H	C	CMU-G	CMU-G	N	CMU-G	N	CMU-G	N	CMU-G	N	CONC	36' - 6"	
511	CORRIDOR	CONC-S	C	CMU-G	CMU-G	N	CMU-G	N	CMU-G	N	CMU-G	N	CONC	12' - 0"	
HVAC ROOM LEVEL															
601	HVAC AREA	R	C	IMP	IMP	FF	SW	FF	SW	FF	IMP	FF	NONE		
602	ELECTRICAL ROOM	CONC-H	C	CMU-G	CMU-G	FF	CMU-G	FF	CMU-G	FF	CMU-G	FF	CONC	15' - 0"	
603	ELEV CONTROL RM	CONC-H	C	CMU	CMU	N	CONC-W	N	CMU	N	CMU	N	CONC	15' - 0"	
ROOF PLAN															
605	VESTIBULE	CONC-S	C	CONC-W	CONC-W	N	CONC-W	N	CONC-W	N	CONC-W	N	CONC		
Grand total: 24															

ROOM FINISH NOTES:
1. AT ALL BELOW GRADE FLOORS (TOTAL OF 4). PROVIDE INTERIOR FACE OF EXTERIOR CONCRET WALLS WITH A PAINTED FINISH FROM FINISHED FLOOR TO 10'-0" ABOVE.
2. PAINT N/S/E/W INTERIOR STAIR CONCRETE/CONCRETE BLOCK WALLS AT EACH FLOOR WITH FROM TOP OF LANDING TO 10'-0" ABOVE.

MATERIAL LEGEND

ACT	2' X 2' ACOUSTICAL CEILING TILES
B	BRICK
CMU	CONCRETE MASONRY UNITS
CMU-G	GROUND CONCRETE MASONRY UNITS
CONC	CONCRETE
CONC-C	CONCRETE CURB
CONC-H	CONCRETE WITH HARDENER
CONC-S	CONCRETE WITH SEALER
CONC-W	CONCRETE WALL
IMP	INSULATED METAL WALL PANEL
P-C	PRECAST CONCRETE PANEL
PT	PAINT

MATERIAL LEGEND

R	ROOF
SW	SCREEN BRICK WALL
VB	VINYL BASE

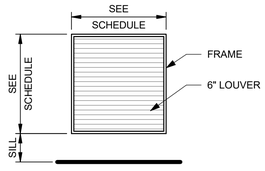
FINISH KEY

E	EXISTING - NO WORK
P1	PAINTED - SEMI GLOSS
P2	PAINTED - FLAT
N	NO ADDITONAL FINISH
FF	FACTORY FINISH
C	CLEAR

LOUVER SCHEDULE

LOUVER	LOUVER TYPE	HEIGHT	WIDTH	HEAD	JAMB	SILL	COMMENTS
L1	A	1' - 6"	1' - 6"	1/430-AD-04	1/430-AD-04	1/430-AD-04	

GENERAL LOUVER NOTES:
1. ALL LOUVERS SHALL BE 6" DRAINABLE LOUVERS
2. PROVIDE ALL LOUVERS WITH SS REMOVABLE INSECT SCREEN
3. ALL LOUVER SUPPORTS AND ANCHORAGE SHALL BE DESIGNED BY THE CONTRACTOR AND/OR MANUFACTURER



LOUVER TYPE A

EXTERIOR MATERIAL FINISH AND COLOR SCHEDULE

MATERIAL	COLOR
BRICK	EMERALD GREEN BY GLEN-GERY OR APPROVED EQUAL
OVERHEAD COILING DOOR	CHARCOAL BY CORNELL DOORS INC OR APPROVED EQUAL
INSULATED METAL PANEL	SLATE GRAY BY CENTRIA OR APPROVED EQUAL
METAL COPING	TO MATCH OVERHEAD COILING DOOR/INSULATE METAL PANELS
DOOR & FRAME	TO MATCH OVERHEAD COILING DOOR/INSULATE METAL PANELS
LOUVER & FRAME	TO MATCH OVERHEAD COILING DOOR/INSULATE METAL PANELS
WINDOW FRAMES	TO MATCH OVERHEAD COILING DOOR/INSULATE METAL PANELS
GUTTER/DOWNSPOUT	TO MATCH OVERHEAD COILING DOOR/INSULATE METAL PANELS
GUTTER	TO MATCH OVERHEAD COILING DOOR/INSULATE METAL PANELS
CONCRETE BOLLARDS	SAFETY YELLOW
PRECAST CONCRETE	INTEGRAL COLOR 'FOG' (1410 LIGHT SAND BLASTED) BY HIGH CONCRETE OR APPROVED EQUAL

Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt
Plot Date: 7/29/2025 12:05:47 PM

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

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evolve environment::architecture

Signer Name: Christine Mondor
Signing Reason: I approved this document
Signing Time: 2025-07-29 16:49:16(EDT)

REGISTERED ARCHITECT PENNSYLVANIA CHRISTINE MONDOR No. RA017577

ARLETTA SCOTT WILLIAMS
EXECUTIVE DIRECTOR, ALCOSAN

3300 PREBLE AVE.
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(412) 766 - 4810

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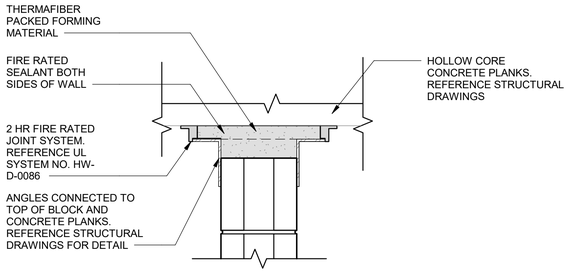
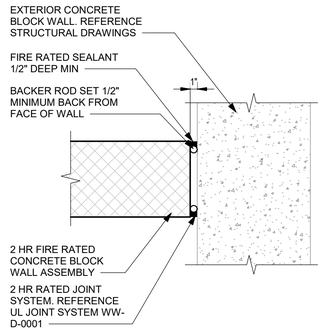
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-AS-01
ROOM FINISH, DOOR, AND WINDOW SCHEDULE

Contract: 1800
CAD File Name:
Date: 5/16/2025
Sheet: 100 of 405

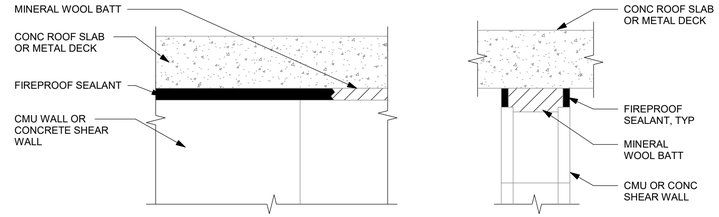


1 FIRE RATED TOP OF WALL
NTS

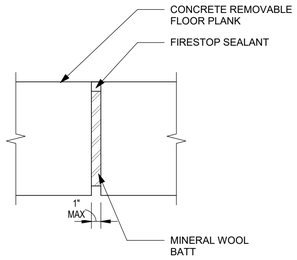


2 FIRE RATED WALL JOINT
NTS

1

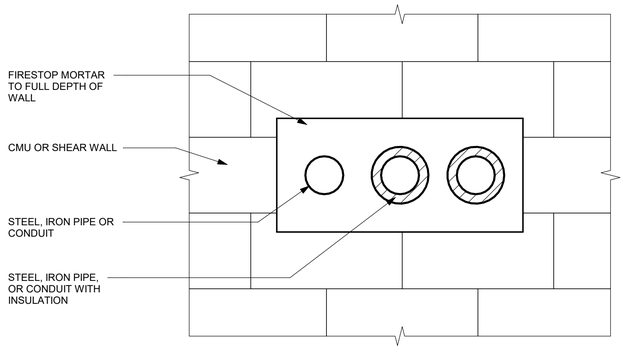


4 UL DESIGN HW-D-0027
NTS

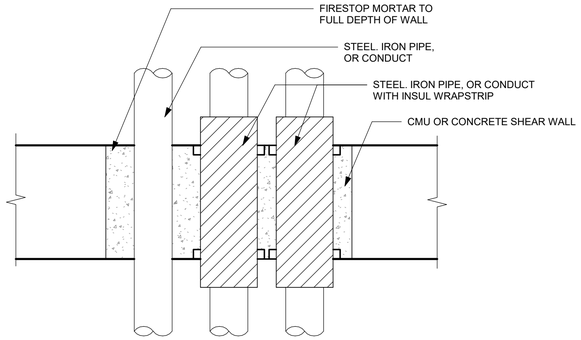


2-HR JOINT AT REMOVABLE PLANKS - (UL FF-D-0042)

6 UL DESIGN FF-D-0042
NTS



2-HR MULTIPLE PIPES THROUGH CMU OR CONCRETE SHEAR WALL



TOP VIEW

5 WALL UL DESIGN C-AJ-8033
NTS

Plot Date: 7/29/2025 11:51:42 AM Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-A-430V21.rvt

Designed by: D.DIDASA	REVISION			
	REV No.	DATE	DESCRIPTION	APPV
Drawn by: S.GRAMKOW	0	5/16/25	ISSUE FOR BID	CKM
	1	07/31/25	ADD. 6 - REVISED DETAILS, NOTES, & FINISH SCHEDULE	CKM
Checked by: D.WALDROP				

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evolve environment::architecture

Signer Name: Christine Mondor
Signing Reason: I approved this document
Signing Time: 2025-07-29 16:49:16(EDT)

REGISTERED ARCHITECT PENNSYLVANIA CHRISTINE MONDOR No. RA-017577

alcosan allegheny county sanitary authority

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

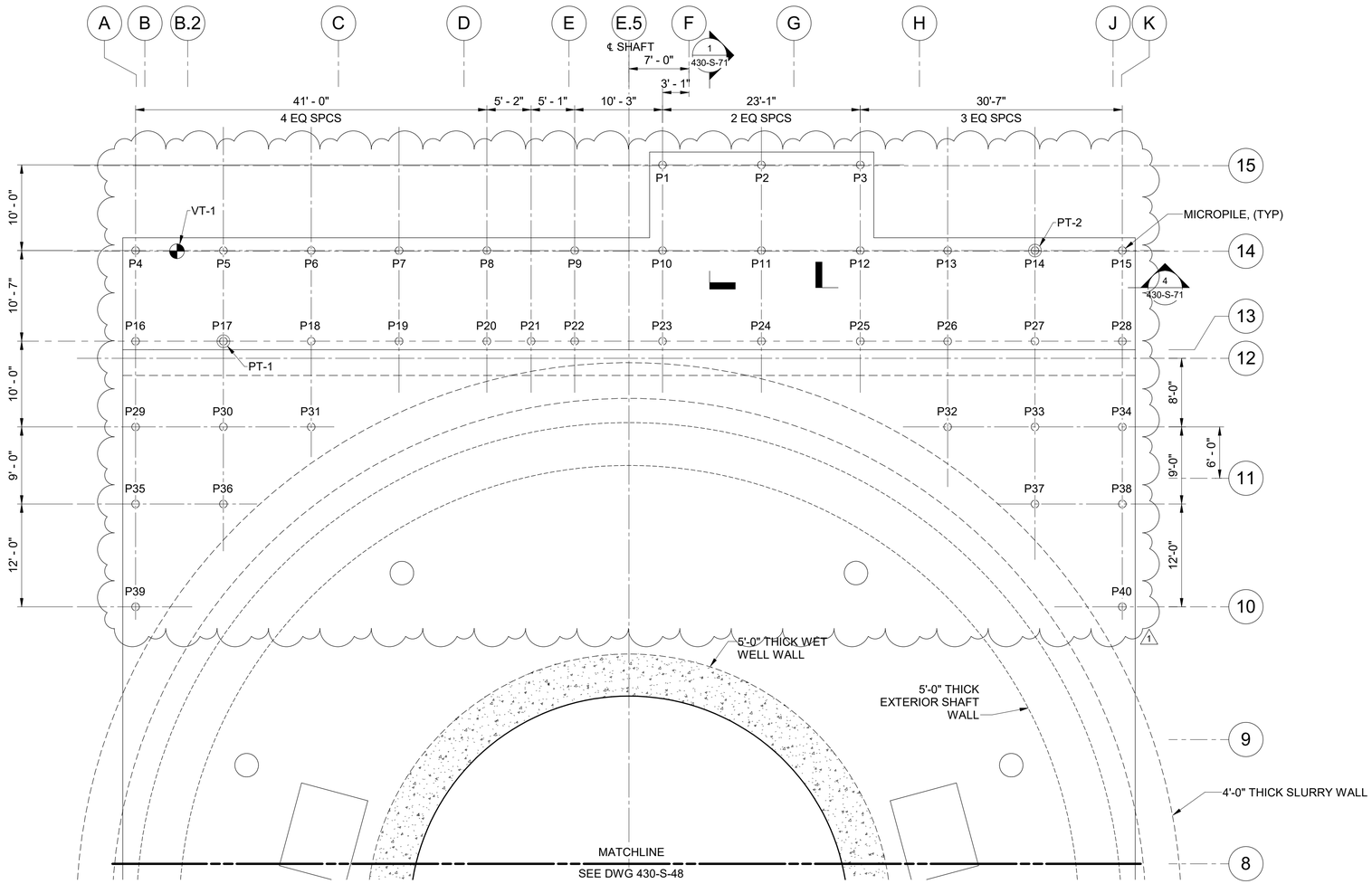
430-AD-09
FIRE STOPPING DETAILS 2

Contract: 1800
CAD File Name:
Date: 5/16/2025
Sheet: 109 of 405

GENERAL NOTES:

1. FOR STRUCTURAL STANDARD DETAILS, SEE DRAWINGS 430-SD-01 TO 430-SD-12.
2. SEE DRAWING 430-S-49 FOR PILE INFORMATION.
3. VT-X = VERIFICATION TEST PILE LOCATION
   PT-X = PROOF TEST PILE LOCATION

N



PILE PLAN NORTH

PILE DESIGNATION	BOTTOM OF SLAB/GRADE BEAM ELEVATION
P1-P28	706.75'
P29-P40	707.75'

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

Path: BIM 360://170064 - ALCOSAN Wet Weather PS/170064-S-430V21.rvt
Plot Date: 7/22/2025 9:03:11 AM

Designed by:	REVISION			
A.KEARNS	REV No.	DATE	DESCRIPTION	APPV
Drawn by:	0	5/16/25	ISSUED FOR BID	JM
T.WIBLE	1	7/31/25	ADD. 6 - ADD PILE DESIGNATIONS/ELEVATIONS	JM
Checked by:				
J.MINADEO				

Brown AND Caldwell

Signer Name: Justin Minadeo
Signing Reason: I approved this document.
Signing Time: 2025-07-29 16:09:02(EDT)

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JUSTIN C MINADEO
7/30/2025
ENGINEER
PE082048

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allegheny county sanitary authority

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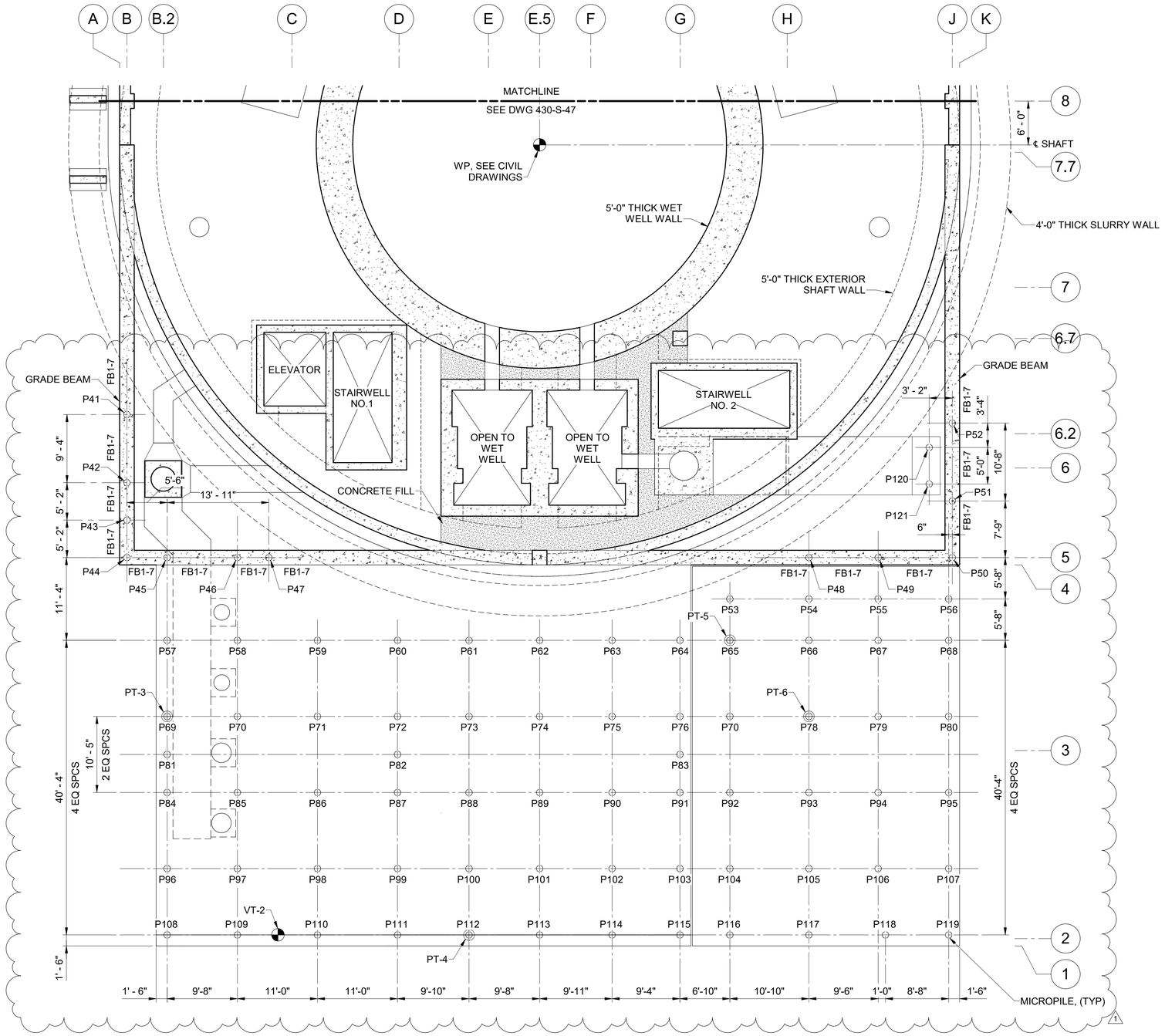
ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-S-47
PILE PLAN NORTH

Contract:	1800
CAD File Name:	
Date:	5/16/2025
Sheet:	175 of 405



GENERAL NOTES:

1. FOR STRUCTURAL STANDARD DETAILS, SEE DRAWINGS 430-SD-01 TO 430-SD-12.
2. SEE DRAWING 430-S-49 FOR PILE INFORMATION.
3. VT-X = VERIFICATION PILE LOCATION
   PT-X = PROOF TEST PILE LOCATION

PILE DESIGNATION	BOTTOM OF SLAB/GRADE BEAM ELEVATION
P41 - P119	724.25'
P120 - P121	706.88'

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

PILE PLAN SOUTH

Designed by:	REVISION			
A.KEARNS	REV No.	DATE	DESCRIPTION	APPV
Drawn by:	0	5/16/25	ISSUED FOR BID	JM
T.WIBLE	1	7/31/25	ADD. 6 - ADD PILE DESIGNATIONS/ELEVATIONS	JM
Checked by:				
J.MINADEO				

Brown AND Caldwell

Signer Name: Justin Minadeo
Signing Reason: I approved this document.
Signing Time: 2025-07-29 16:09:02(EDT)

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
JUSTIN C. MINADEO
7/30/2025
ENGINEER
PE082048

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ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
WET WEATHER PUMP STATION

430-S-48
PILE PLAN SOUTH

Contract:	1800
CAD File Name:	
Date:	5/16/2025
Sheet:	176 of 405

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

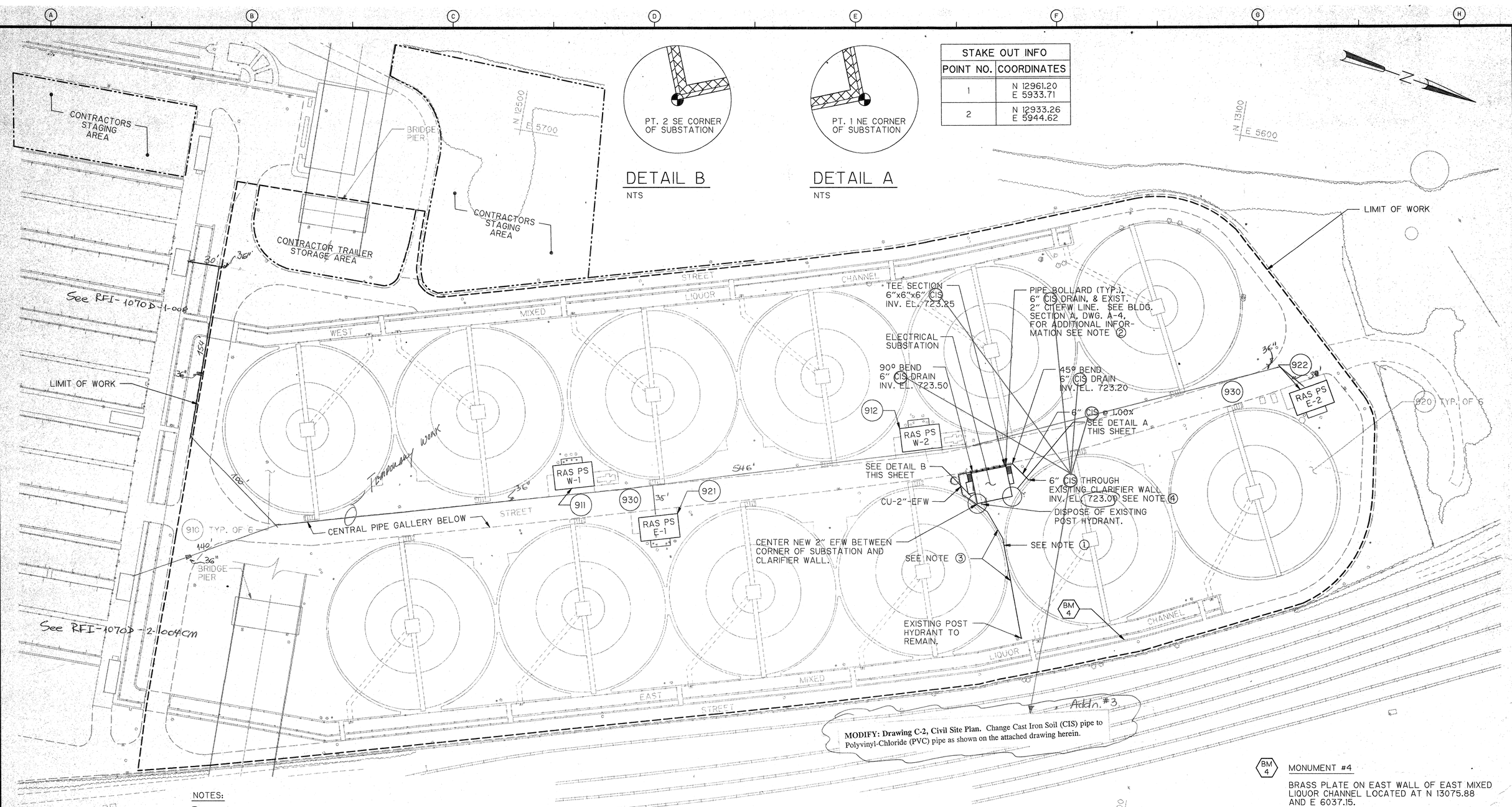
Plot Date: 7/22/2025 9:03:12 AM

ATTACHMENT – D

Addendum No. 6 Reference Information

TABLE OF CONTENTS

STAKE OUT INFO	
POINT NO.	COORDINATES
1	N 12961.20 E 5933.71
2	N 12933.26 E 5944.62



BM 4 MONUMENT #4

BRASS PLATE ON EAST WALL OF EAST MIXED LIQUOR CHANNEL LOCATED AT N 13075.88 AND E 6037.15.
ELEV. 728.41

NOTES:

1. EXISTING 2" C.I. EFW LINE WITH POST HYDRANT TO BE REMOVED AND REPLACED BETWEEN GALLERY WALL AND EXISTING POST HYDRANT WITH NEW 2" C.U. EFW LINE AS SHOWN. UTILIZE EXISTING PIPING CHASE BTWN CLARIFIERS.
2. EXISTING 2" C.I. EFW LINE SHOULD BE AT ELEVATION 721.2+ AT THE GALLERY WALL. CONNECT TO EXISTING LINE WITH NEW 2" C.U. AND ROUTE ALONG FRONT OF NEW SUBSTATION AT OR BELOW ELEVATION 722.00. SECURE IN A WATERTIGHT MANNER TO THE EXISTING GALLERY WALL WITH 2 EQUALLY SPACED S.S.T. PIPE SADDLE SUPPORTS. ANY DAMAGE TO THE EXISTING 2" C.I. EFW OR THE WATERTIGHT SEAL AT THE CENTRAL GALLERY WALL OR OVERHANG MUST BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COMPENSATION.
3. NEW 2" C.U. EFW BY PROCESS/MECHANICAL CONTRACTOR TO MATCH LINE AND GRADE OF EXISTING 2" C.I.P. FROM BEHIND THE NEW BUILDING TO THE POST HYDRANT. RELOCATE AROUND BUILDING AS SHOWN, MINIMUM DEPTH TO BE 3'-6" EXCEPT ALONG FRONT OF NEW SUBSTATION. (SEE NOTE 2)
4. CORE DRILL HOLE FOR THE 6" P.V.C. THROUGH THE EXISTING CLARIFIER WALL AT ELEVATION SHOWN. SECURE 6" P.V.C. IN PLACE FLUSH WITH INNER FACE OF EFFLUENT CHANNEL, USING NON SHRINK GROUT. REPAIR ANY DAMAGE TO EXISTING WALL TO THE SATISFACTION OF THE ENGINEER.

NOTES (GENERAL):

1. FOR ELECTRICAL SITE WORK SEE DRAWING ESP-1.
2. SITE IN AREA OF PROPOSED ELECTRICAL SUBSTATION, 2" C.I. EFW REPLACEMENT AND 6" PVC DRAIN IS PAVED AND SHALL BE REPAIRED BY GENERAL CONTRACTOR AT CONCLUSION OF CONTRACT IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
3. ALL WORK SHOWN ON THIS SHEET BY GENERAL CONTRACTOR UNLESS NOTED OTHERWISE.

N 13100
E 6200

0 40 80 120
SCALE 1"=40'

DRAWN BY: R. ONDERKO
CHECKED BY: W. SEIGFRIED
EXAMINED BY: E. MONROE
ALCOSAN EXAMINED BY:

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL Edward W. Monroe ENGINEER No. 035773 E
Edward W. Monroe 8-29-96

Gannett Fleming ENGINEERS AND PLANNERS

REV.	DESCRIPTION	DATE	APP.
0			
1			
2			
3			
4			

APPROVED

EXECUTIVE DIRECTOR Joseph W. Langwell DATE 8/26/96
DIRECTOR OF ENGR. & CONST. P.E.-19592E DATE
PROJECT MANAGER Nicholas J. Marchese DATE 23aug96

ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
PITTSBURGH, PENNSYVANIA

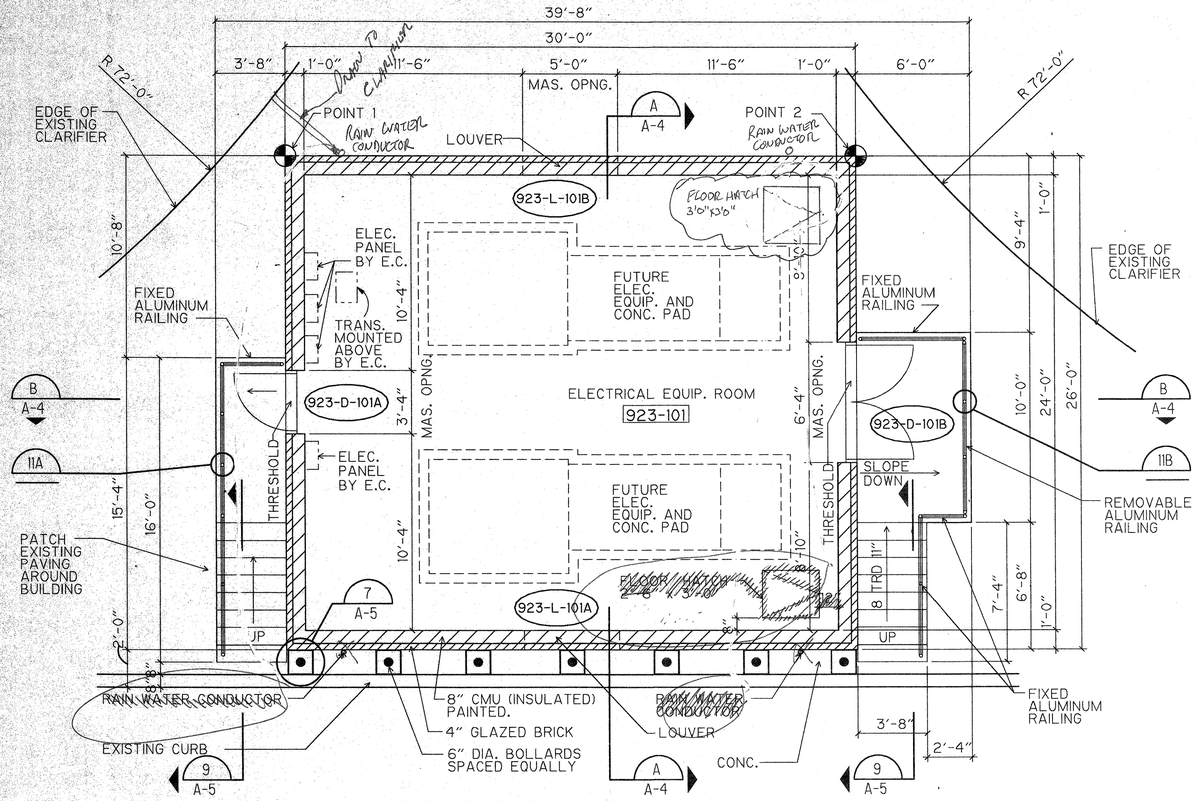
RETURN ACTIVATED SLUDGE PUMPING STATION MODIFICATIONS

CIVIL SITE PLAN

SCALE: 1" = 40' CONTRACT No. 1070D SHEET 5 OF 76

FILENAME: 000MD005.DGN
DATE PLOTTED: 08/01/96

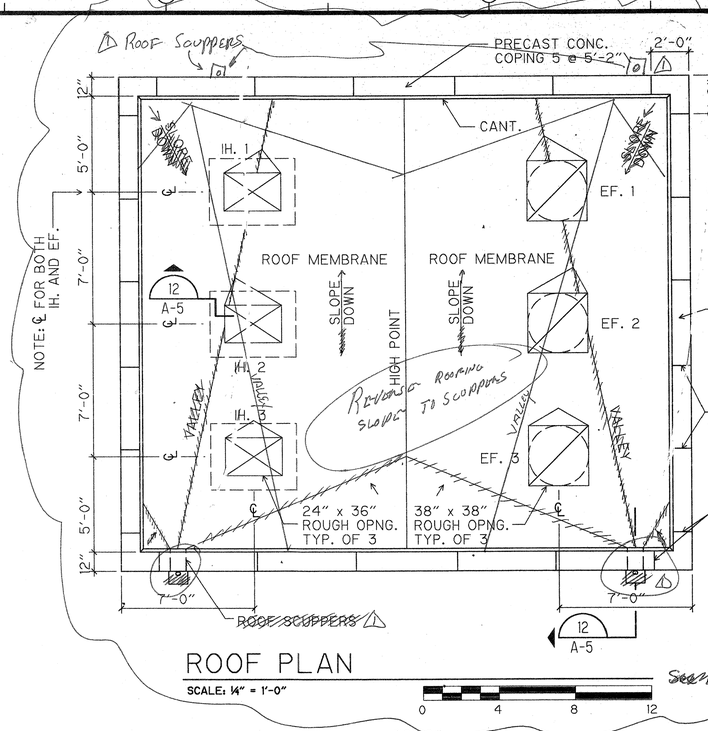
C-2



FIRST FLOOR PLAN

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

0 4 8 12



NOTE:
1. EXHAUST FAN (EF) AND INLET HOOD (IH) BY PLUMBING / HVAC CONTRACTOR
2. TAPER INSULATION AROUND EXHAUST FAN AND INLET HOOD TO PREVENT PONDING OF WATER

ROOF PLAN

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

0 4 8 12

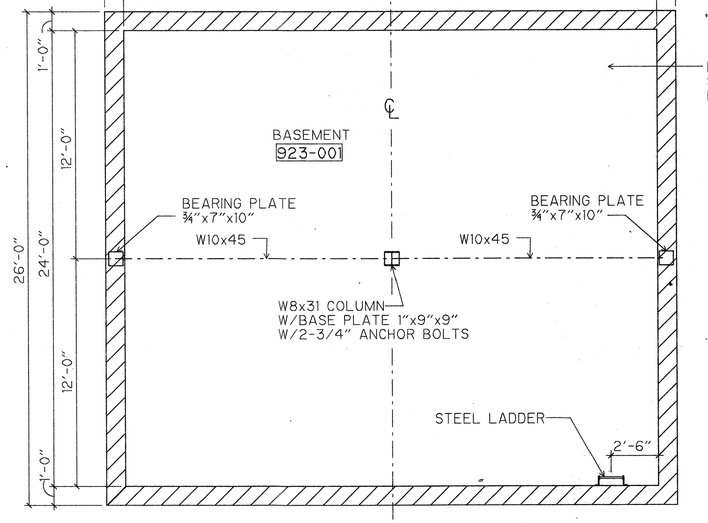
STAKEOUT COORDINATES

POINT 1 - NORTHEAST CORNER EXTERIOR MASONRY

NORTH: 12961.20
EAST: 5933.71

POINT 2 - SOUTHEAST CORNER EXTERIOR MASONRY

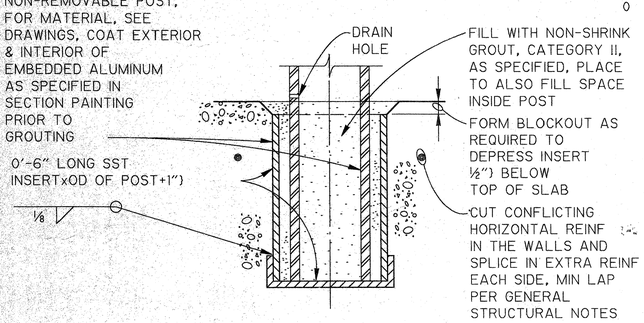
NORTH: 12933.26
EAST: 5944.62

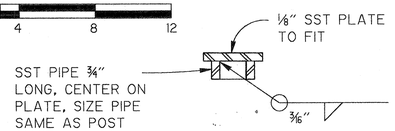


BASEMENT PLAN

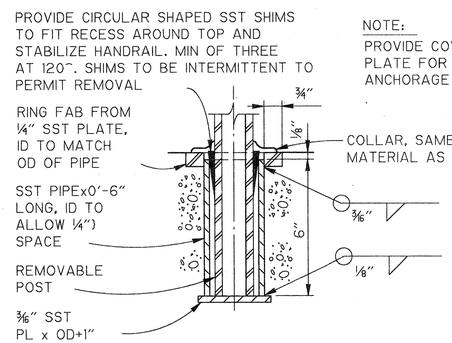
SCALE: 1/4" = 1'-0"

0 4 8 12





COVER PLATE



NOTE:
PROVIDE COVER PLATE FOR EACH ANCHORAGE SLEEVE.

11B - REMOVABLE RAILING

NOTES:
1. PROVIDE PROTECTION FOR DISSIMILAR METALS AND CONCRETE PER SPECIFICATIONS.
2. PROVIDE DRAIN HOLES AS SPECIFIED AT TOP OF GROUT.
3. AT CONTRACTOR'S OPTION, INSERT SLEEVE SHALL BE REMOVABLE PLASTIC TUBE TO LEAVE A TAPERED HOLE IN CONCRETE, SUCH AS AUCIELLO IRON WORKS, HUDSON, MA; OR EQUAL.

11A - FIXED RAILING

RAILING EMBEDMENT

11

NTS

DRAWN BY: B. DIANA
CHECKED BY: D. BURGE
EXAMINED BY: E. MONROE
ALCOSAN EXAMINED BY:

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL Edward W. Monroe ENGINEER 22-96

APOSTOLOU ASSOCIATES ARCHITECTS PLANNERS

Gannett Fleming ENGINEERS AND PLANNERS

REV.	DESCRIPTION	DATE	APP.
0			
1	BFI 1070D-1-005		
2			
3			
4			

APPROVED

EXECUTIVE DIRECTOR — DATE 8/26/96

DIRECTOR OF ENGR. & CONST., P.A.P.E.-19592E — DATE

PROJECT MANAGER — DATE 23aug96

ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
PITTSBURGH, PENNSYVANIA

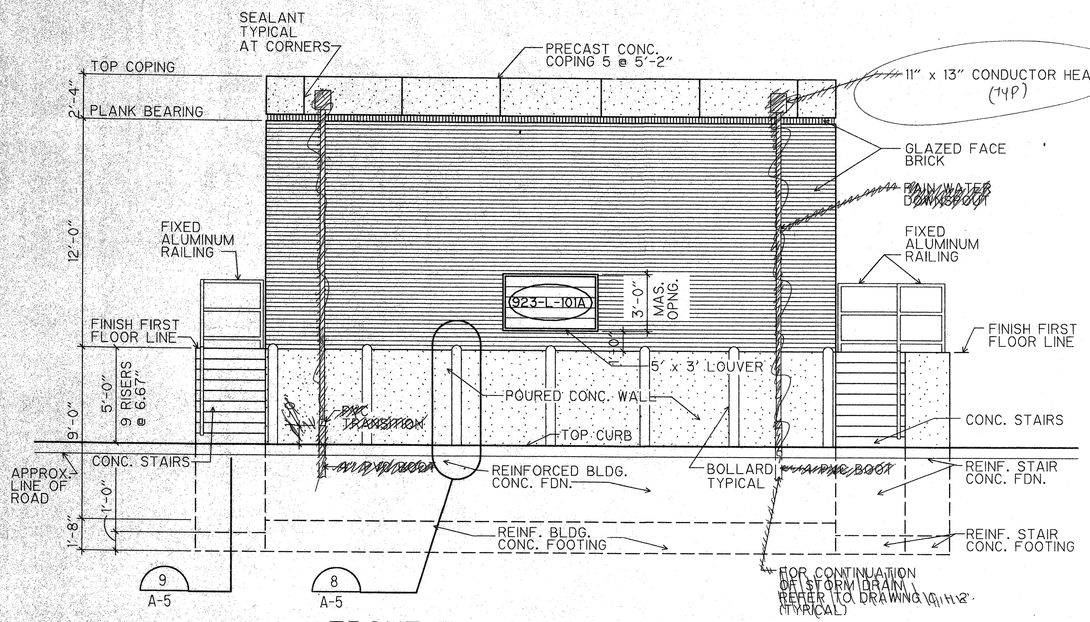
RETURN ACTIVATED SLUDGE PUMPING STATION MODIFICATIONS

ARCHITECTURAL SUBSTATION PLANS

SCALE: AS NOTED | CONTRACT No. 1070D | SHEET 7 OF 76

FILENAME: 923AD007.DGN
DATE PLOTTED: 08/01/96

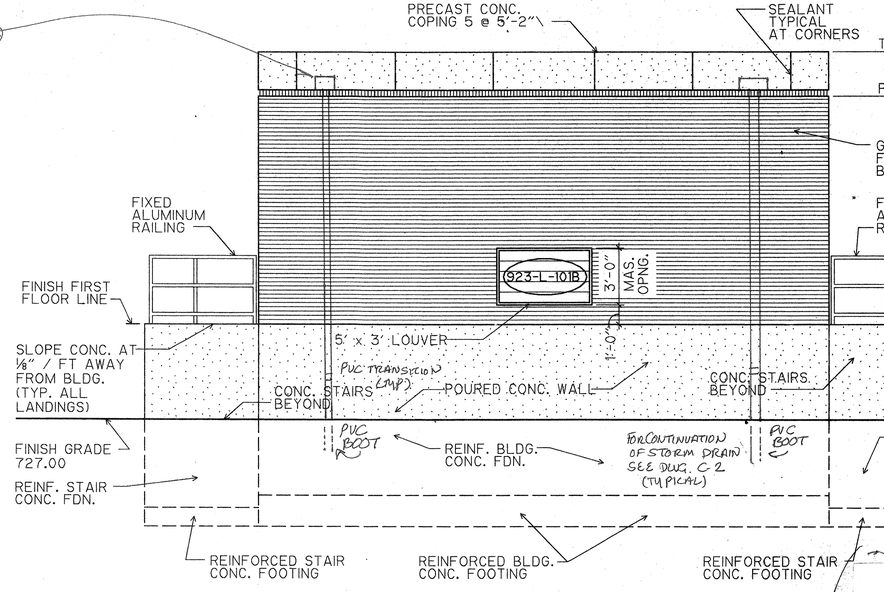
A-2



FRONT ELEVATION — WEST

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

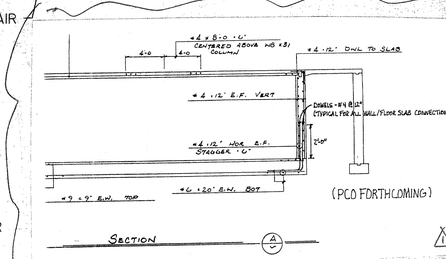
0 4 8 12

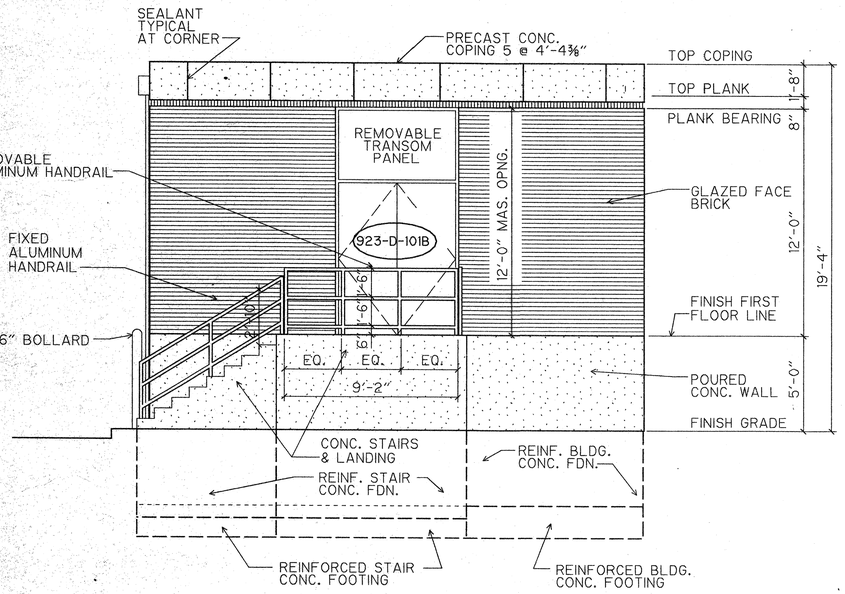


REAR ELEVATION — EAST

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

0 4 8 12



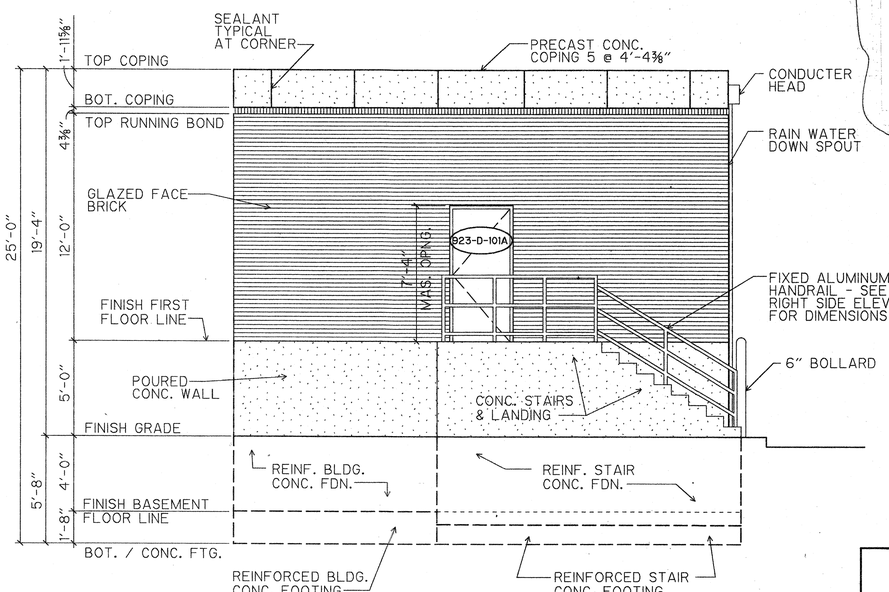


RIGHT SIDE ELEVATION — SOUTH

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

0 4 8 12

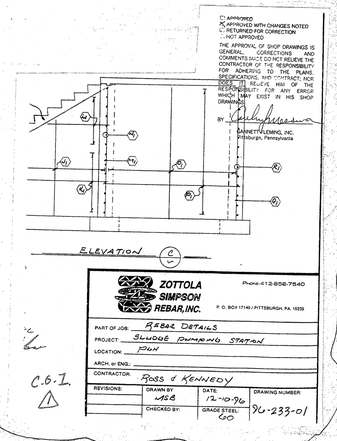
See RFI 1070D-1-003 CM



LEFT SIDE ELEVATION — NORTH

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

0 4 8 12



DRAWN BY: B. DIANA
CHECKED BY: D. BUIRGE
EXAMINED BY: E. MONROE
ALCOSAN EXAMINED BY:

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER Edward W. Monroe No. 10577-E

APOSTOLOU ASSOCIATES ARCHITECTS PLANNERS

Gannett Fleming ENGINEERS AND PLANNERS

REV.	DESCRIPTION	DATE	APP.
0			
1	C.O. 1070D-1-001		
2			
3			
4			

APPROVED

EXECUTIVE DIRECTOR — DATE 8/24/96

DIRECTOR OF ENGR. & CONST. PA.PE-19592E — DATE 23aug96

PROJECT MANAGER — DATE

ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
PITTSBURGH, PENNSYVANIA

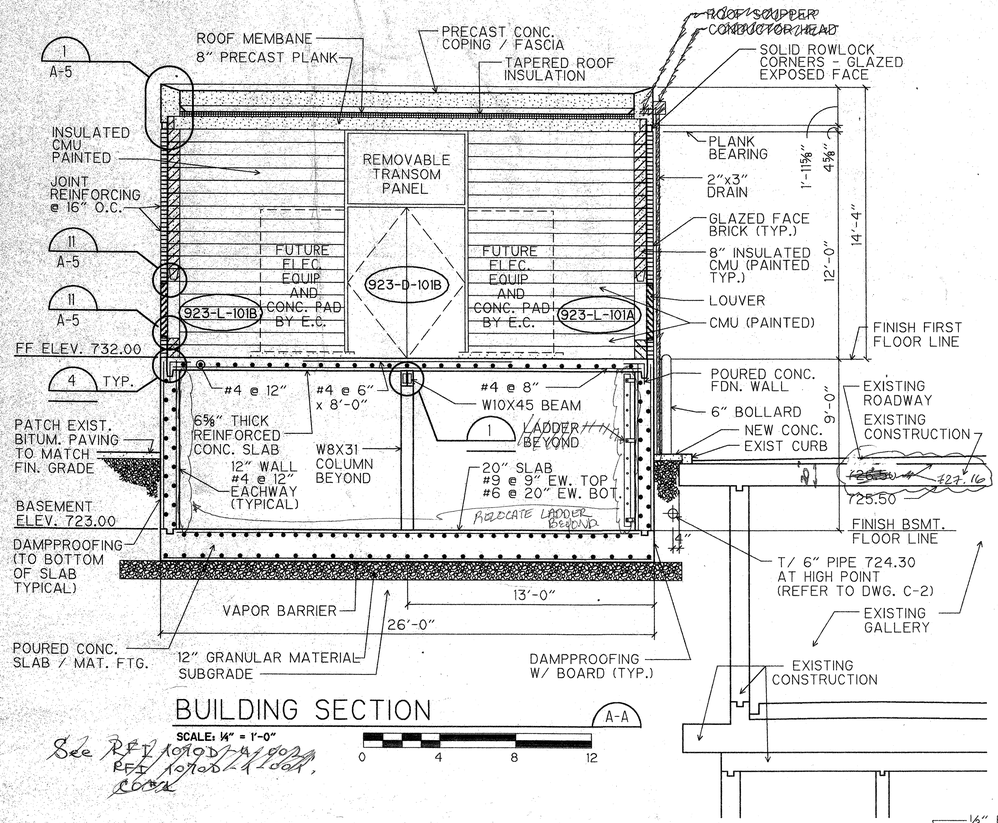
RETURN ACTIVATED SLUDGE PUMPING STATION MODIFICATIONS

ARCHITECTURAL SUBSTATION ELEVATIONS

SCALE: AS NOTED | CONTRACT No. 1070D | SHEET 8 OF 76

FILENAME: 923AD008.DGN
DATE PLOTTED: 08/01/96

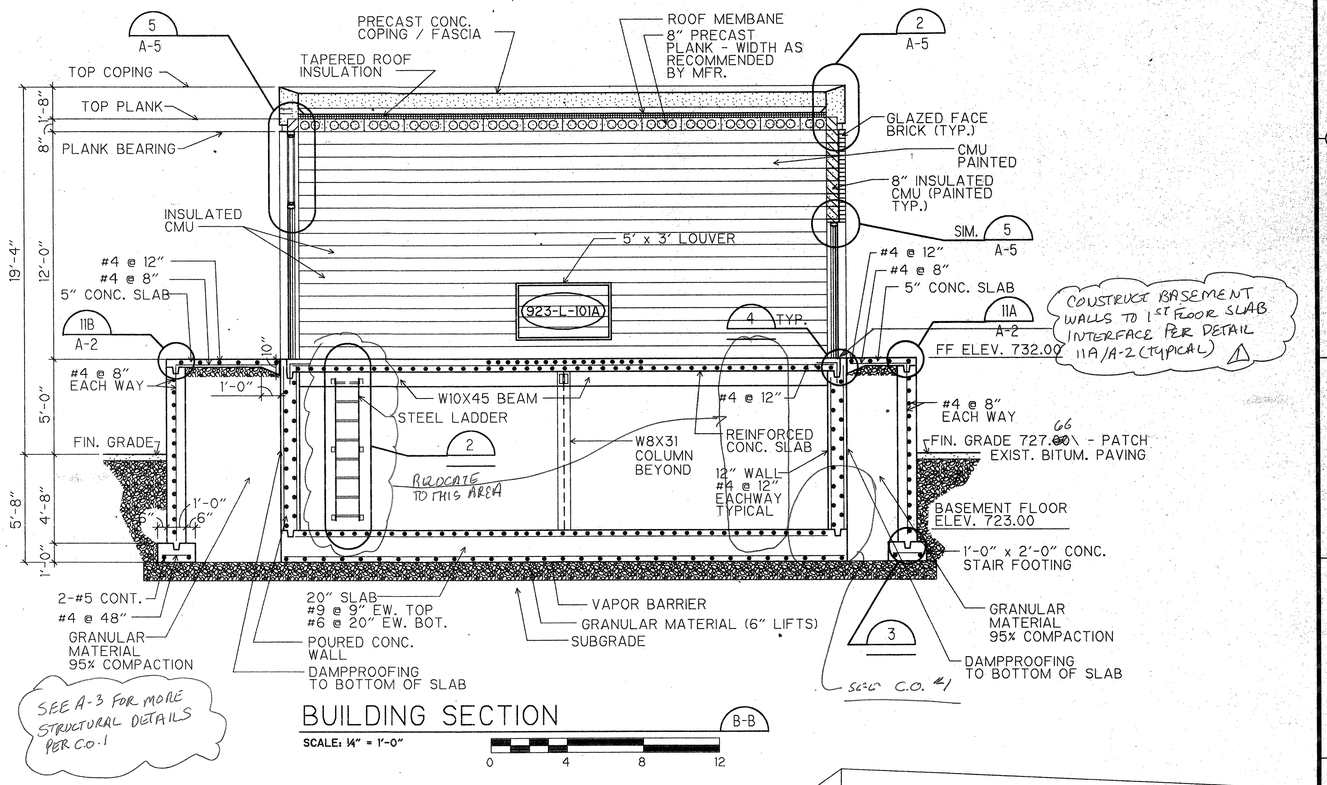
A-3



BUILDING SECTION A-A

SCALE: ¼" = 1'-0"

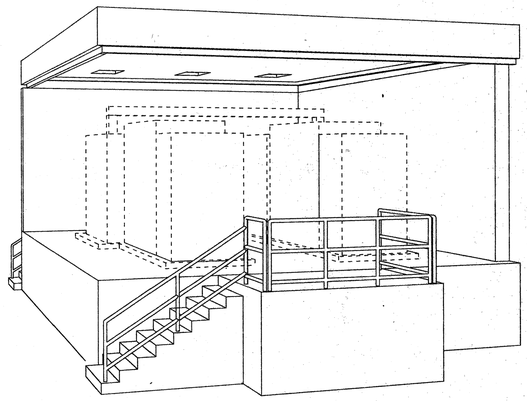
See RFI 1070D-1-002, RFI 1070D-1-003, CO-001



SEE A-3 FOR MORE STRUCTURAL DETAILS PER CO-1

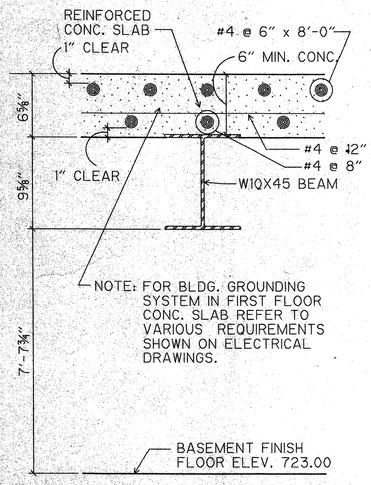
BUILDING SECTION B-B

SCALE: ¼" = 1'-0"



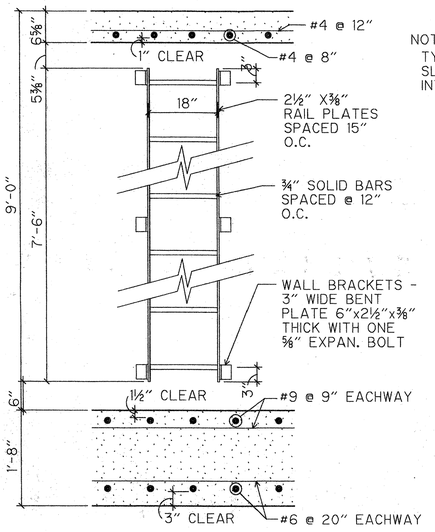
INTERIOR BUILDING PERSPECTIVE

SCALE: NONE



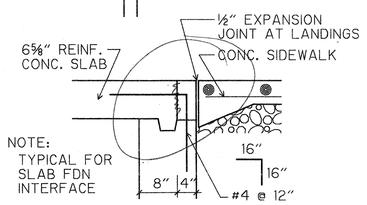
DETAIL 1

SCALE: 1½" = 1'-0"



LADDER DETAIL 2

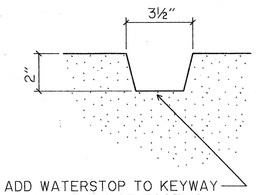
SCALE: ¾" = 1'-0"



DETAIL 4

SCALE: ¾" = 1'-0"

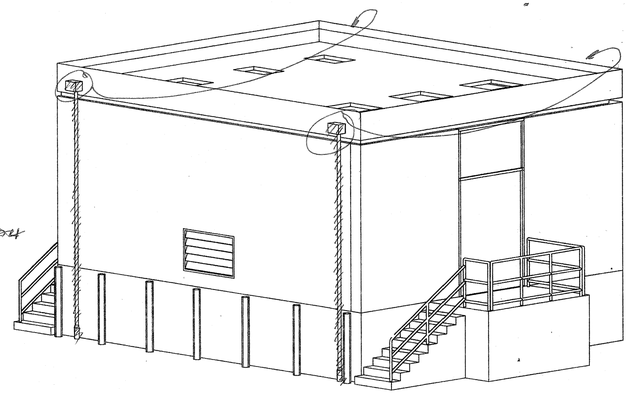
See RFI 1070D-1-004 CO-004



TYPICAL KEYWAY DETAIL 3

SCALE: 3" = 1'-0"

See RFI 1070D-1-003 on Dwg. A-2



EXTERIOR BUILDING PERSPECTIVE

SCALE: NONE

INTERIOR BUILDING PERSPECTIVE

SCALE: NONE

DRAWN BY: B. DIANA
CHECKED BY: D. BUIRGE
EXAMINED BY: E. MONROE
ALCOSAN EXAMINED BY:

Commonwealth of Pennsylvania — Registered Professional Engineer — Edward W. Monroe — No. 035771 — Edward W. Monroe 8.20.96

APOSTOLOU ASSOCIATES ARCHITECTS PLANNERS
Gannett Fleming ENGINEERS AND PLANNERS

REV.	DESCRIPTION	DATE	APP.
0			
1	RFI 1070D-1-004		
2			
3			
4			

APPROVED

EXECUTIVE DIRECTOR — DATE 8/26/96

DIRECTOR OF ENGR. & CONST. / PA.PE-19592E — DATE

PROJECT MANAGER — DATE 23aug96

ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
PITTSBURGH, PENNSYVANIA

RETURN ACTIVATED SLUDGE PUMPING STATION MODIFICATIONS

ARCHITECTURAL
SUBSTATION SECTIONS AND PERSPECTIVES

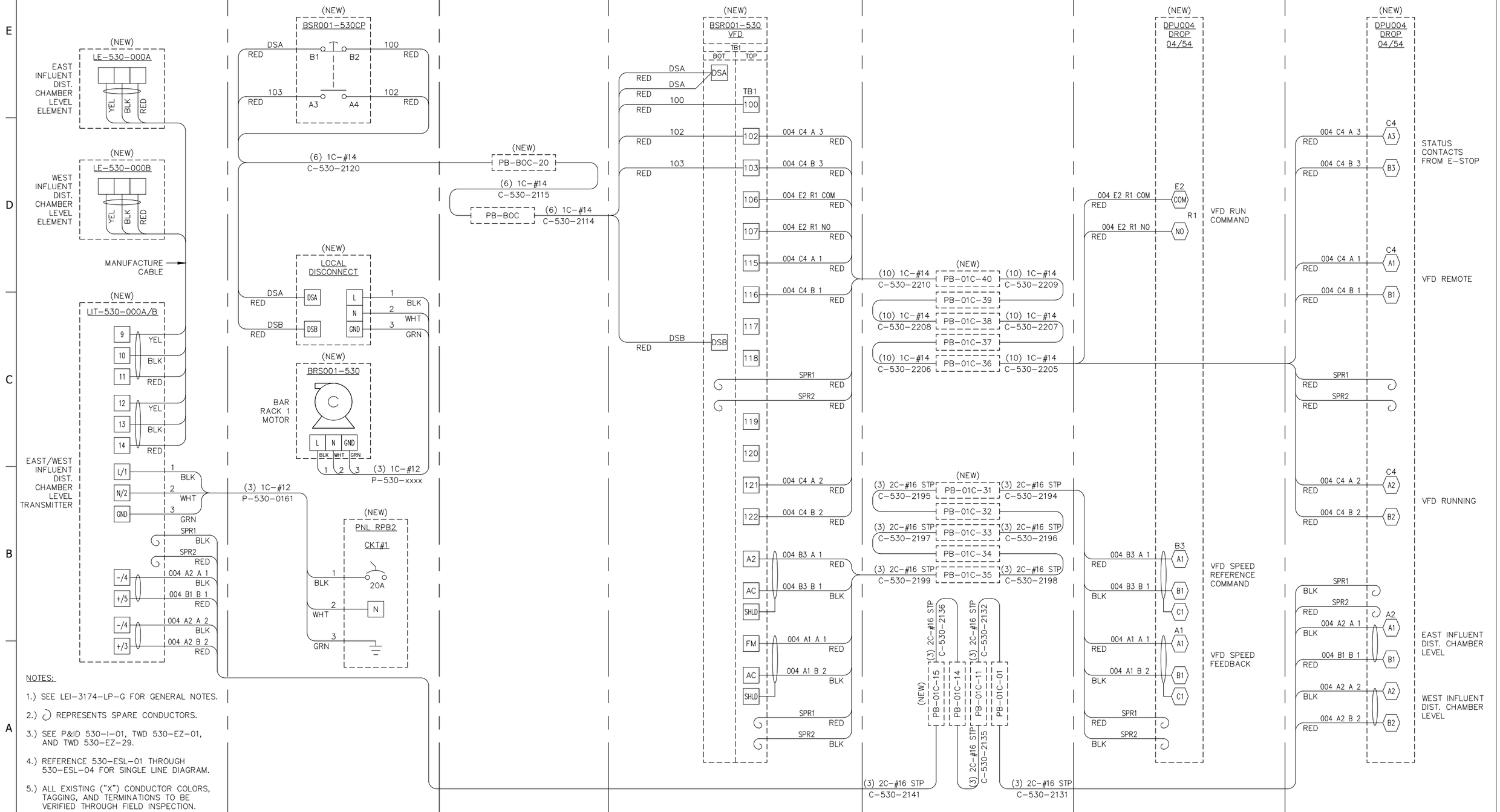
SCALE: AS NOTED | CONTRACT No. 1070D | SHEET 9 OF 76

FILENAME: 923AD009.DGN
DATE PLOTTED: 08/01/96

A-4

Section 5L: Sample Loop Drawings

8	7	6	5 – 4	3	2	1
FIELD PROCESS AREA	LOCAL CONTROL PANELS	FIELD PROCESS AREA	CONTROL PANEL	FIELD PROCESS AREA	DCS / DPU FRONT	DCS / DPU REAR
AREA 530 – FIRST FLOOR	AREA 530 – FIRST FLOOR	AREA 530	AREA 530 – ELECTRICAL ROOM	AREA 530	AREA 530 – ELECTRICAL ROOM	AREA 530 – ELECTRICAL ROOM



NOTES:

1.) SEE LEI-3174-LP-G FOR GENERAL NOTES.

2.) ◯ REPRESENTS SPARE CONDUCTORS.

3.) SEE P&ID 530-I-01, TWD 530-EZ-01, AND TWD 530-EZ-29.

4.) REFERENCE 530-ESL-01 THROUGH 530-ESL-04 FOR SINGLE LINE DIAGRAM.

5.) ALL EXISTING ("X") CONDUCTOR COLORS, TAGGING, AND TERMINATIONS TO BE VERIFIED THROUGH FIELD INSPECTION.

REV.#	DATE	DESCRIPTION	BY	REV.#	DATE	DESCRIPTION	BY

TOLERANCE BLOCK
X.X = 0.1
X.XX = 0.01
X.XXX = ±0.005
ANGULAR = ±0°30'

SHEET SIZE: D

SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:
NTS	DATE:	DATE:	DATE:

ALLEGHENY COUNTY SANITARY AUTHORITY (ALCOSAN)

LOOP DIAGRAM - BSR001-530

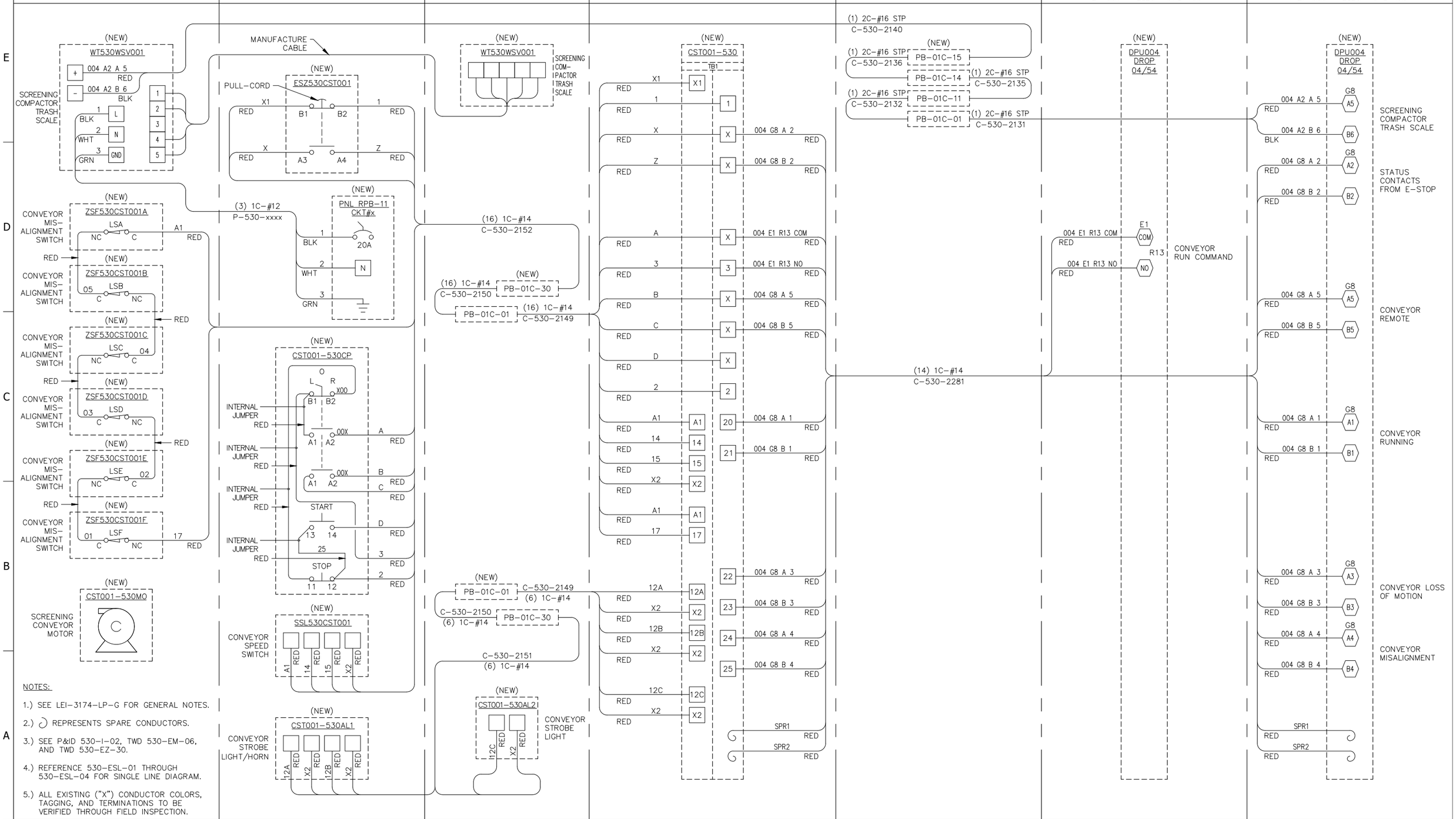
PROJECT NO.: **LEI-3174**

REV. NO.: **A**

DWG. NO.: LEI-3174-LP-530-01

SHT. NO.: 1 OF XX

8	7	6	5 – 4	3	2	1
FIELD PROCESS AREA	LOCAL CONTROL PANELS	FIELD PROCESS AREA	CONTROL PANEL	FIELD PROCESS AREA	DCS / DPU FRONT	DCS / DPU REAR
AREA 530 – FIRST FLOOR	AREA 530 – FIRST FLOOR	AREA 530	AREA 530 – FIRST FLOOR	AREA 530	AREA 530 – ELECTRICAL ROOM	AREA 530 – ELECTRICAL ROOM



NOTES:

1.) SEE LEI-3174-LP-G FOR GENERAL NOTES.

2.) ◯ REPRESENTS SPARE CONDUCTORS.

3.) SEE P&ID 530-I-02, TWD 530-EM-06, AND TWD 530-EZ-30.

4.) REFERENCE 530-ESL-01 THROUGH 530-ESL-04 FOR SINGLE LINE DIAGRAM.

5.) ALL EXISTING ("X") CONDUCTOR COLORS, TAGGING, AND TERMINATIONS TO BE VERIFIED THROUGH FIELD INSPECTION.

REV.#	DATE	DESCRIPTION	BY	REV.#	DATE	DESCRIPTION	BY

TOLERANCE BLOCK
X.X = 0.1
X.XX = 0.01
X.XXX = 0.005
ANGULAR = ±0°30'

SHEET SIZE: D

SCALE:	DRAWN BY:	CHECKED BY:	APPROVED BY:
NTS	DATE:	DATE:	DATE:

ALLEGHENY COUNTY SANITARY AUTHORITY (ALCOSAN)

LOOP DIAGRAM - CST001-530

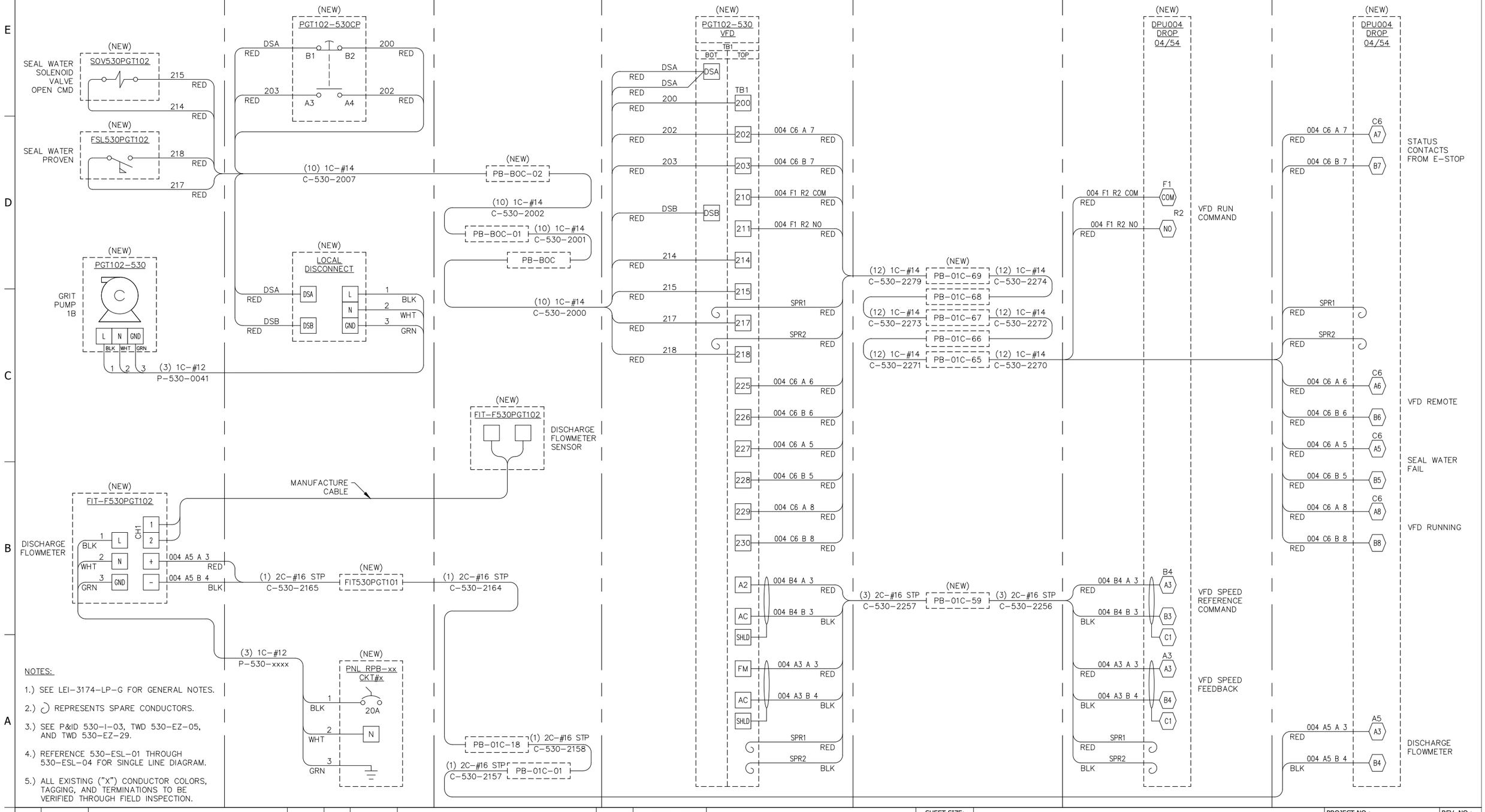
PROJECT NO.: **LEI-3174**

REV. NO.: **A**

DWG. NO.: LEI-3174-LP-530-07

SHT. NO.: 7 OF XX

8	7	6	5 – 4	3	2	1
FIELD PROCESS AREA	LOCAL CONTROL PANELS	FIELD PROCESS AREA	CONTROL PANEL	FIELD PROCESS AREA	DCS / DPU FRONT	DCS / DPU REAR
AREA 530 – BASEMENT LEVEL	AREA 530 – BASEMENT LEVEL	AREA 530	AREA 530 – ELECTRICAL ROOM	AREA 530	AREA 530 – ELECTRICAL ROOM	AREA 530 – ELECTRICAL ROOM



NOTES:

1.) SEE LEI-3174-LP-G FOR GENERAL NOTES.

2.) ◯ REPRESENTS SPARE CONDUCTORS.

3.) SEE P&ID 530-I-03, TWD 530-EZ-05, AND TWD 530-EZ-29.

4.) REFERENCE 530-ESL-01 THROUGH 530-ESL-04 FOR SINGLE LINE DIAGRAM.

5.) ALL EXISTING ("X") CONDUCTOR COLORS, TAGGING, AND TERMINATIONS TO BE VERIFIED THROUGH FIELD INSPECTION.

REV.#	DATE	DESCRIPTION	BY	REV.#	DATE	DESCRIPTION	BY

TOLERANCE BLOCK
X.X = 0.1
X.XX = 0.01
X.XXX = 0.005
ANGULAR = ±0°30'

SCALE: NTS | DRAWN BY: DATE: | CHECKED BY: DATE: | APPROVED BY: DATE:

SHEET SIZE: D

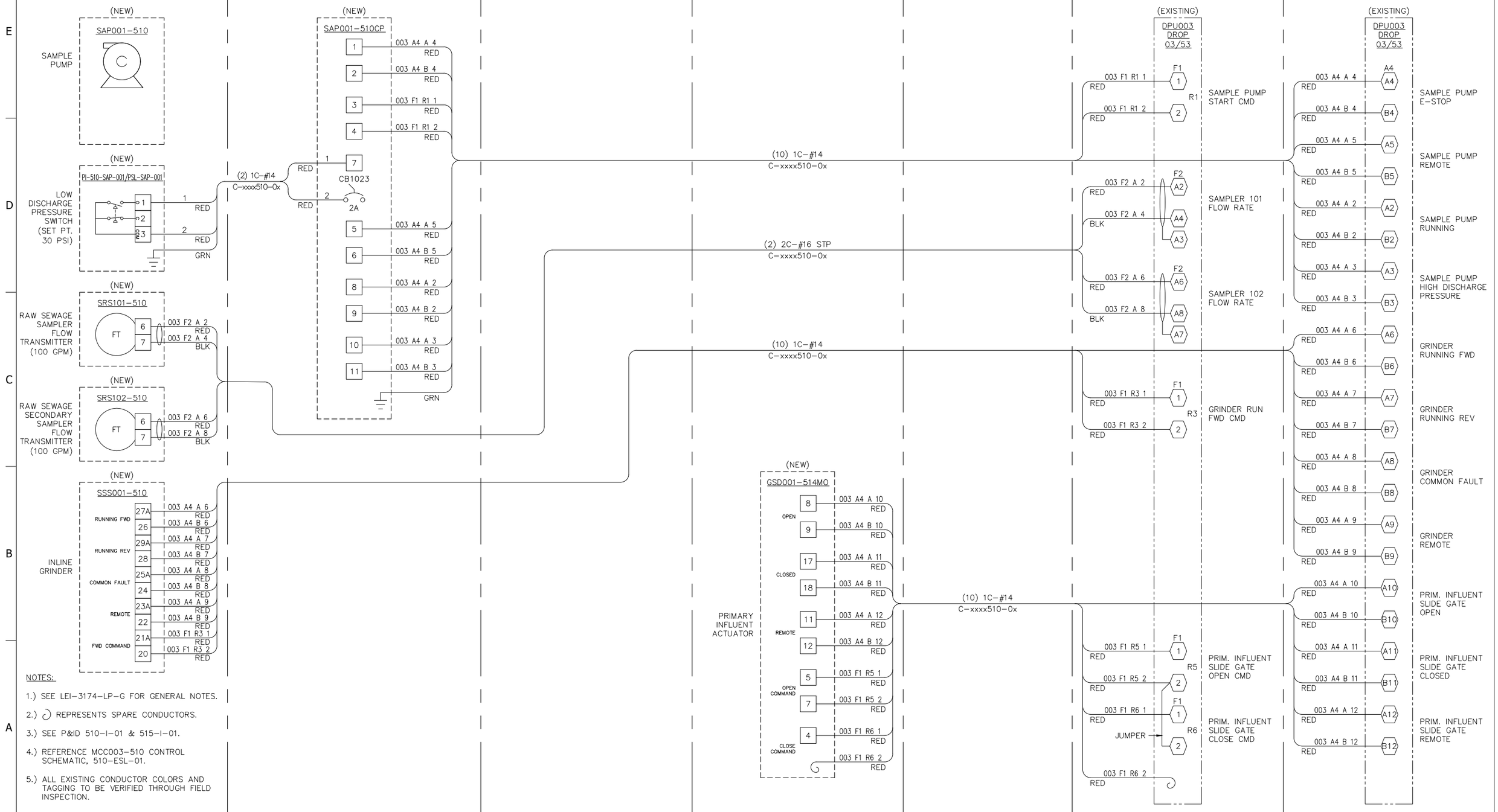
ALLEGHENY COUNTY SANITARY AUTHORITY (ALCOSAN)

LOOP DIAGRAM - PGT102-530

PROJECT NO.: **LEI-3174** | REV. NO.: **A**

DWG. NO.: LEI-3174-LP-530-10 | SHT. NO.: 10 OF XX

8	7	6	5	4	3	2	1
FIELD PROCESS AREA	LOCAL CONTROL PANELS	CONTROL PANEL	FIELD PROCESS AREA	FIELD PROCESS AREA	DCS / DPU FRONT	DCS / DPU REAR
AREA 510 – RACK AND CHLORINATION BUILDING	AREA 510 – RACK AND CHLORINATION BUILDING	AREA 510 – RACK AND CHLORINATION BUILDING	AREA 514 – GRIT CHAMBERS AREA	AREA 500 – MAIN PUMPING STATION	AREA 500 – MAIN PUMPING STATION	AREA 500 – MAIN PUMPING STATION



NOTES:

1.) SEE LEI–3174–LP–G FOR GENERAL NOTES.

2.) ◯ REPRESENTS SPARE CONDUCTORS.

3.) SEE P&ID 510–I–01 & 515–I–01.

4.) REFERENCE MCC003–510 CONTROL SCHEMATIC, 510–ESL–01.

5.) ALL EXISTING CONDUCTOR COLORS AND TAGGING TO BE VERIFIED THROUGH FIELD INSPECTION.

REV.#	DATE	DESCRIPTION	BY	REV.#	DATE	DESCRIPTION	BY

TOLERANCE BLOCK
X.X = 0.1
X.XX = 0.01
X.XXX = 0.005
ANGULAR = ±0°30'

SCALE: NTS | DRAWN BY: DATE: | CHECKED BY: DATE: | APPROVED BY: DATE:

SHEET SIZE: D

ALLEGHENY COUNTY SANITARY AUTHORITY (ALCOSAN)

LOOP DIAGRAM - SAP001-510 (1 OF 2)

PROJECT NO.: LEI-3174 | REV. NO.: A

DWG. NO.: LEI-3174-LP-510-01 | SHT. NO.: 1 OF 4