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SEPTEMBER 22, 2025

CONTRACT NO. 1800

WET WEATHER PUMP STATION

ADDENDUM NO. 12

All bidders bidding **Contract No. 1800** shall read and take note of this **Addendum No. 12**. 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. 12

The Acknowledgement attached to **Addendum No. 12** is to be signed and returned immediately via email at contract.clerks@alcosan.org and acknowledged with Bidder's Proposal.

Kimberly Kennedy, P.E.

Director – Engineering and Construction

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

ADDENDUM NUMBER 12

FIRM NAME: _____

SIGNATURE: _____

TITLE: _____

DATE: _____

September 22, 2025

CONTRACT NO. 1800

WET WEATHER PUMP STATION

ADDENDUM NO. 12

ADDENDUM No. 12

ALLEGHENY COUNTY SANITARY

AUTHORITY

PITTSBURGH, PENNSYLVANIA

CONTRACT NO. 1800

WET WEATHER PUMP STATION PROJECT

September 22, 2025

ATTENTION

BID OPENING DATE

THURSDAY, OCT 2, 2025

11:00 A.M.

DEADLINE FOR QUESTIONS WAS THURSDAY, SEPTEMBER 4, 2025

This Addendum No. 12 consists of 16 pages and the following attachments:

Attachment A - Addendum No. 12 Specifications (39 pages)

Attachment B - Revised Geotechnical Baseline Report (38 pages)

Attachment C - Addendum No. 12 Drawing – 22” x 34” (1 page)

ATTENTION BIDDERS

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

The Bidder is responsible for verifying that he/she has received and reviewed all of the pages of the Contract Documents as well as all of the pages and attachments of all addenda. The Bidder shall verify all pages with the table of contents in the Contract Documents and the first page of all Addenda. Receipt of this Addendum No. 12 must be noted on the Bid Form. These items modify the portions of the documents specifically noted; all other provisions of the Contract Documents shall remain in effect

1. CHANGES TO PRIOR ADDENDUM

- 1.1 In Addendum No. 5 Question No. 14 as it relates to Volume 1 of 5, Article 3.8, paragraph 4 on page 3-9. **CHANGE** the first sentence to the following:
- “If any part of the Contractor's Work depends for proper execution or results upon the work of any Other Contractor, the Contractor shall within ~~48~~ 72 hours of its anticipated start of the Work in a particular area inspect the work of the Other Contractors and report in writing to the Construction Manager any apparent discrepancies, interferences, defects, or delays in such work that render it unsuitable for the proper execution and results of the Contractor's Work.”
- 1.2 In Addendum No. 5 Question No. 37 as it relates to Volume 1 of 5, Article 3.59, paragraph 4 on page 3-59. **CHANGE** the first sentence to the following:
- “The Contractor represents and warrants that the Work and services to be performed under the Contract, and all workmanship, materials, Work, and equipment provided, furnished, used or installed in the construction of the same, shall be safe, substantial, and durable construction in all respects, ~~of the highest quality and best obtainable in every respect,~~ new (unless otherwise provided herein), shall be free from faults or defects, shall be performed and furnished in strict accordance with the Contract Documents, and that the strength of parts of all manufactured equipment shall be adequate and as specified and explicitly warrants the merchantability and the fitness for use and quality of all Owner approved substituted Items provided by it or its subcontractors and warrants that all Owner approved substituted Items will perform to the standard of the Item originally specified.”

2. CHANGES TO THE SPECIFICATIONS

- 2.1 In Volume 2 of 5, Specification Section 01 11 00 Summary of Work, **REPLACE** this Section in its entirety. Refer to Attachment A.

2.2 In Volume 2 of 5, Specification Section 01 22 00 Measurement and Payment, **REPLACE** this Section in its entirety. Refer to Attachment A.

2.3 In Volume 2 of 5, Specification Section 01 52 00 Maintenance of Plant Operations, Part 1.02.O, **ADD** the following sentence to the end:

" Existing utility relocations necessary to advance the slurry wall and associated support of excavation activities as generally described in Phases 1 through 12 below and as shown on the drawings, shall be completed within 415 days from Notice to Proceed."

2.4 In Volume 2 of 5, Specification Section 01 52 00 Maintenance of Plant Operations, Part 1.07.C.1, **REPLACE** the text with the following:

"1. The refeed of Building 410 in Phase 2 will need to be completed before some portions of Phase 3 is started. Contractors may proceed with any nonconflicting work in Phase 2 and 3 concurrently."

3. CHANGES TO THE GEOTECHNICAL BASELINE REPORT

3.1 **REPLACE** Volume 4 of 5 Geotechnical Baseline Report in its entirety. Refer to Attachment B.

4. CHANGES TO THE DRAWINGS

4.1 **REPLACE** Sheet 430-GT-04 with Sheet 430-GT-04 Rev.01, refer to Attachment C.

5. QUESTIONS AND ANSWERS

Q1: In Spec Section 40 66 10 1.04-A, regarding the Distributed Antenna System (DAS), it states that an RFI shall be submitted to obtain information on the service carriers. Please provide carriers for the following:

1. City of Pittsburgh 800 MHz
2. Wi-Fi Service
3. Cell phone wireless service

A1: Service providers will be confirmed during construction.

Q2: In Spec Section 40 66 10 1.04 (A.1) it states that City of Pittsburgh 800 Mhz service is to be installed. ALL public safety agencies in Allegheny County including the City of Pittsburgh use UHF band not 800 MHz. The road department and water authorities use 800 MHz. In (B) it says "capable of receiving approval from PSN AHJ...". In Allegheny County the AHJ is the

Fire Marshall whose interest is in the usage of public safety radios indicating to me that the DAS should be UHF not 800 MHz. Please confirm the proper frequency band ALCOSAN wants installed in their DAS system.

A2: AHJ frequency will be confirmed during construction.

Q3: The revised Facility Startup Specification (01 75 00) that was included in Addendum #9 outlined approximate testing durations that are part of the Facility Start-Up Process. Given that the current Facility Start-Up Specification still states that "The exact sequence of the facility start-up, if any, will depend upon a Start-up Schedule to be developed by the Construction Manager with ALCOSAN, Engineer, and the Contractors." There is still uncertainty in the exact duration, sequence, and availability of Owner/CM/Engineer resources associated with the Facility Start-Up Process which is ultimately tied to Project Substantial Completion. In order to reduce contractor risk for unknown overall facility startup duration and potential liquidated damages that would be beyond the Contractors control please revise the prerequisites for substantial completion to: 1) Construction work brought to a state of substantial completion 2) Completion of Physical Checkout Process 3) Submittal of Required Documents.

A3: As with previous plant expansion projects, the Contractor is required to provide advance notice of testing readiness to ALCOSAN, the Construction Manager, and the Engineer. This notice allows appropriate time for Owner, CM, and Engineer personnel to be available for testing and start-up activities. The Contractor is fully responsible for the coordination of their own forces, subcontractors, and vendors, as these are under the Contractor's direct control. However, per Section 01 75 00 (Facility Start-Up) and Section 01 78 39 (Contract Closeout and Execution Requirements), the Contractor is not responsible for delays caused solely by the unavailability of Owner/CM/Engineer resources, provided the Contractor has met all requirements for readiness and has given proper notice. The Start-Up Schedule is to be developed collaboratively, and the Owner will not assess liquidated damages for delays in start-up or substantial completion that are solely due to Owner/CM/Engineer resource availability, provided the Contractor has fulfilled all contractual requirements for readiness and notice. The prerequisites for Substantial Completion remain as stated in the Contract Documents:

1. Construction work brought to a state of substantial completion,
2. Completion of physical checkout and equipment start-up,
3. Submittal of required documents,
4. Completion of required personnel training

Q4: Specific Allowance Pay Items #7, 8, 9, 10, 11 & 12 are paid by a fixed unit price instead of a pre-determined dollar amount for work that possibly will not be performed. This fact will lead to a large variance in unit prices

Contractors submit on the Bid Form and could be the difference between which Contractor is the low and responsible bidder since the prices for these items are included in the Total Bid Price on the Bid Form.

In order to more fairly administer the contract to both Contractors and ALCOSAN's rate payers, please change all Specific Allowance items to be paid via the Force Account Process and place an expected dollar value into the bid items to account for the cost."

A4: The contract documents require that Specific Allowance Items #7, 8, 9, 10, 11, and 12 be bid and paid as unit price items, with the extended total included in the Total Bid Price. The quantities for these items were established based on previous experience with plant expansion projects, to provide a fair and reasonable estimate for bidding. The Owner reserves the right to adjust quantities by Change Order if actual work differs from the estimated quantities. 01 22 00 specification clearly defines the scope of the Bid Items referenced.

Q5: Specification 01 22 00 - Measurement and Payment, paragraph 3.1.W.1 for Pay Item 23 indicates this pay item is an allowance for potential force account work associated with Acid Producing Rock Disposal and is to be paid per ton based on submitted truck weigh tickets.
This pay item contradicts itself in the Measurement and Payment section. If we are to be paid via force account, as the specification says, this item needs to be paid through the force account process and the pay item needs to be changed to have a pre-determined dollar amount allowance instead of a fixed price per ton. If an item is to be paid by force account then they actual unit price will depend on the actual Time & Material records submitted for the work performed. A fixed unit price cannot be determined at bid time.

A5: Refer to Item 2.2 of this Addendum.

Q6: The Owners Conceptual Construction Schedule shows Site Prep Utilities and Relocations starting 30 days after NTP. It is expected that Site Prep and Utility Relocations will begin later than 30 days after NTP due to the following preceding activities:

- 1) Contract Execution and Project Buyout will take longer than 30 days.
- 2) All existing utilities are required to be field verified via potholing/exploratory excavation prior to beginning any demolition or construction of new work.
- 3) The Electrical Infrastructure Report must be submitted and approved prior to the beginning of any demolition or construction of new work.
- 4) The Maintenance of Plant Operations Plan must be submitted and approved prior to initiating work.

Based on the prerequisites to beginning Site Prep and Utility Relocations as mentioned above please add an additional 6 months to the Contract

Duration.

- A6:** Additional duration will not be added to the Contract Times stated in Article 4. See Addendum 10, Vol 1, Section 5M, Page 1 for Limitations associated with the Conceptual Construction Schedule. Contractor is responsible for developing their own construction schedule after award that meets the project milestones and completion dates per Section 01 32 16.

Some of the work associated with Phases 1 and 2 overlaps the Electrical Infrastructure Report development. The other major work activities are mostly related to demolition. The Electrical Infrastructure Report submittal can be made in two parts, with the first submittal only addressing the work in the early phases. Once existing infrastructure is confirmed to be not in use, demo work can proceed. Some of the Phase 3 work associated with non-electrical systems can start before the completion of all Phase 1 & 2 work. The major exceptions are the Electrical Infrastructure Report and the demo of the overhead cable tray and new ductbank to the 410 building on the southern end of the site. The majority of the scope for these early phases is for demolition, and there are limited new materials being installed; therefore, buyout to proceed with these phases should be limited.

- Q7:** The Owners Conceptual Construction Schedule does not account for the installation of geotechnical instrumentation and the associated baseline readings. Please add an additional two months to the Contract Duration.
- A7:** See response to Question 6.

Geotechnical Instrumentation and Monitoring activities are not shown as they are not on a top critical path. Per 31 09 13 1.04.5.a baseline readings are not required to be submitted until 1 week prior to shaft construction starts. It is anticipated that shaft construction start more than a year after NTP, which will allow plenty of time to submit, install, and get baseline readings. Note coordination of site utility installation and demolition will need to be coordinated with this work.

- Q8:** It appears that the Owners Conceptual Construction Schedule assumes multi-shift work for slurry wall installation, shaft excavation, and shaft concrete activities. Multi-shift work for these activities will be impractical/inefficient based on the following:

- 1) Limited availability of night shift concrete and driver work hour restrictions from ready-mix suppliers
- 2) Night shift blasting restrictions for shaft excavation
- 3) Off-site waste areas for excavated shaft material will not accept material

at night and/or will have quantity limitations at night

4) Potential mass concrete requirements may impose form removal restrictions for the shaft wall concrete that would negate any schedule time savings night shift could provide. For example, if wall forms cannot be stripped for 5 days due to mass concrete requirements it would not make sense to work second shift placing rebar because there is enough time to place rebar on day shift while the forms are required to stay in place.

5) The availability of skilled labor to facilitate multi-shift work will be uncertain due to the high labor demand required for the WWPS project, ORT project, and other major construction projects in the region.

Please add an additional 24 months to the Contract Duration.

A8: See response to Question 6.

Q9: Question 8 in Addendum No. 6 requested to add an interim milestone date to complete the new utility infrastructure. The answer given was "Contract Documents stand as written."

According to the bid schedule provided as part of Addendum No. 10, these utility demolitions and relocations will account for 385 of the provided 2,127 calendar days to substantial completion or over 18% of the contract duration from NTP to substantial completion.

As the Contract Documents are currently written, what is to stop the Electrical Prime contractor from taking all 2,127 calendar days to substantial completion to relocate these utilities? There are no penalties or restrictions to prevent this.

If a milestone is added, there will be no ambiguity when the Construction Manager merges the four project schedules into one because EVERYONE will have the completion date of this work at the time of bid.

Please reconsider the response previously provided and add a completion milestone date for the completion of the Utility Relocations.

A9: Refer to Item 2.3 of Addendum No. 12.

Q10: As per The Geotechnical Base Report (GBR) Paragraph 6.1.1.1
“...obstructions will be encountered during shaft excavation throughout the Fill”.

Also, Paragraph 7.2.1 of GBR states that “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.”.

- Please provide clarifications on the anticipated 5% assumption (i.e. quantity of obstructions, depth, size, location, etc.)
- Please confirm that this 5% assumption applies for the excavated volume starting 10 ft below the ground level.

A10: GBR stands as written. 5% volume assumption applies for all slurry wall panels excavated in soil, regardless of depth.

Q11: Reference specification section 03 39 00 paragraphs 3.01.A.2 & 3.01.A.7.a.1) : These state that water is not permitted for curing of mass concrete. Water is typically used in addition to the use of cooling tubes to control the temperature of mass concrete during curing. Please allow the use of water for temperature control of mass concrete curing or confirm that it is not permitted.

A11: Water curing of mass concrete placements is not recommended per ACI 207 and will not be permitted. Contract documents will not be updated.

Q12: Based on a review of the GBR and GDR documents there is highly permeable residuum at the rock interface between Elevations 727 to 675 within the overburden. If the contractor elects to perform grouting within this permeable residuum, to minimize chances of slurry losses and assist with trench stability for the installation of the diaphragm wall, could this grouting be covered for payment under the pay items for Pre-Excavation Grouting and Cut-off Grouting?

A12: Pre-excavation grouting and Cut-off grouting payment provisions are for the Pre-excavation grouting and Cut-off grouting as specified in the Contract Documents. Additional Pre-excavation grouting or Cut-off grouting, beyond what is defined in the Contract Documents, will be considered incidental to the installation of the slurry wall.

Q13: Why does ALCOSAN require contractors to coordinate and resolve disputes without direct Owner involvement?

A13: ALCOSAN's specification language, particularly Article 3.8 and Division 01, establishes a framework for contractor-led coordination and dispute resolution to streamline project execution under a multiple prime contract structure.

Article 3.8 explicitly directs all contractors to cooperate in the progression of the work and outlines a peer-to-peer dispute resolution process. This approach is designed to accelerate conflict management and protect ratepayers from excessive change orders or claims. Contractors are expected to self-coordinate, manage risks, and resolve conflicts independently. By removing ALCOSAN as the default dispute resolver, the contract encourages contractors to proactively manage their own interfaces and risks.

Division 01 further designates the General Contractor as the coordinating entity, recognizing that the sequencing of work by other prime contractors is largely dependent on the General Contractor's schedule and activities. This designation ensures a clear leadership role in field coordination and sequencing.

Regarding the other contracts that interface with Contract No. 1800, ALCOSAN has provided a detailed contract drawing 000-G-06 (Overall Site Utilization and Access Plan) that identifies access routes and laydown areas for known surrounding projects. This visual aid in addition to contract drawing 430-SOE-12 (Tunnel Junction Chamber and DWT Temporary Bulkhead Alternatives) and contract specification 01 52 00 (Maintenance of Plant Operations) help bidders anticipate the expected interface points and plan accordingly to avoid conflicts. ALCOSAN does not expect any other interface points beyond what is included here.

Q14: What contractual mechanism allows contractors to request an adjustment in contract time when impacted by another contractor, utility owner, or third party?

A14: Contractors may seek a time adjustment by submitting written notice to the Owner in accordance with Article 3.34.B. This notice must comply with Article 3.34.B and contract specification 01 32 16, paragraph 1.16, and detail how their progress, performance, or completion of the work has been affected by any of the conditions outlined in Article 3.34.A. Timely and properly documented notice is essential to preserve the contractor's right to request an adjustment in contract time.

Q15: Why does ALCOSAN have the right to reschedule or re-sequence Contractor's work?

A15: ALCOSAN does not have blanket authority to reschedule or re-sequence contractor's work at will. Expanding on information already described in the contract documents, ALCOSAN's authority to reschedule or re-sequence contractor's work is reserved for two scenarios:

1. Emergency:

- Contract No. 1800 will occur at an active wastewater treatment plant that operates 24/7/365. When there is contract work that will impact those active operations/utilities, there are restrictions defined for the contractor's work. Reference 01 52 00 (Maintenance of Plant Operations) for additional information.

2. Contractor is behind schedule due to his or her own progress and not attempting to recover:

- Contract specification 01 32 16, paragraph 1.12, describes the requirements for Schedule Recovery. If a Contractor refuses, fails, or neglects to take appropriate recovery action or to submit a written recovery statement, ALCOSAN has the right to reschedule or re-sequence the contractor's work.

Q16: How are contractors compensated for delays?

A16: Article 3.34.A describes categories for delays and extensions of time. Article 3.34 further goes on to describe which category and scenarios would have basis for additional compensation, and which would not. Article 3.32 describes what costs would be able to be paid.

Q17: Why must contractors proceed with disputed work?

A17: Article 3SC, Section 3.56 requires contractors to continue work, even when disputes arise, ensuring that unresolved claims do not disrupt progress. This clause is critical for maintaining coordination among multiple prime contractors and preserving the overall project schedule, while also acknowledging that the dispute process can take time. This clause protects all prime contractors, so that one prime contractor's dispute does not pause the entire project. This clause is also in the best interest of the ratepayers.

Q18: What is ALCOSAN's rationale to NCR response requirements and timelines?

A18: ALCOSAN's contract language reflects a deliberate strategy to ensure timely and effective resolution of non-conforming work through a Non-Conformance Report (NCR) process. The stringent response expectations serve multiple purposes:

- Timely Correction of Deficiencies

The contract grants ALCOSAN authority to intervene when corrective actions are delayed or insufficient. This ensures that non-conforming work is addressed promptly, minimizing the risk of schedule impacts or cascading quality issues.

- Enforcement Leverage

The language acts as a deterrent against repeated or serious non-compliance and reinforces the importance of contractor accountability. ALCOSAN does not enforce the NCR contractual correction period of 3 days for small issues, especially items that are not impacting the project's critical (or near-term critical) path, or plant operations.

- Risk Mitigation and Project Continuity

By enforcing strict response timelines for items identified in the bullet above, ALCOSAN reduces the likelihood that unresolved defects will compromise project integrity. This approach protects both the Owner and the public from delays, safety risks, or operational disruptions.

- Emergency Response Capability

The provision permitting ALCOSAN to take possession of a contractor's tools, equipment, and machinery, when absolutely necessary, serves as a safeguard that enables the Owner to promptly mobilize resources for urgent corrective actions. This authority is particularly important in situations where delays or deficiencies could jeopardize public health, safety, or environmental compliance. In the rare occurrence that ALCOSAN would exercise this right, ALCOSAN may also reduce the need for extensive backcharges to the contractor, as it allows the Owner to directly address and resolve issues without prolonged disruption. This would be a benefit to both ALCOSAN and the contractor.

- Zero-Tolerance for Unauthorized Work

The clause reflects ALCOSAN's commitment to maintaining high standards and strict adherence to contract specifications. Unauthorized or defective work is treated seriously, and contractors are expected to respond with urgency and precision.

Q19: Numerous Contractor questions were listed in Addendum 5 (Q4,Q12,Q14,Q15,Q16,Q17,Q18,Q19,Q20,Q21,Q22,Q23,Q24,Q25,Q26,Q29,Q32,Q34,Q35,Q36,Q37,Q38,Q39,Q40,Q41,Q42,Q43,Q44,Q46,Q47,Q48,Q49,Q50,Q51,Q53,Q54,Q55,Q56,Q57,Q58,Q60) requesting changes to the Contract language to reasonably balance risk between Alcosan and the Contractor. As written, the Contract language unfairly favors the Owner, placing significant and in some cases incalculable risk on the Contractor. The answers to all but a few of the questions were ""Contract language to remain."" Considering the responses to the questions the bidders have two choices; Decide not to bid the project or evaluate the significant risk in the Contract and include appropriate cost in their bid to cover this excessive risk. Either choice is not in the best interest of Alcosan or the rate payers of Allegheny County. We respectfully request that Alcosan re-evaluate their responses to these questions and provide provisions in the Contract that more fairly allocate risk in line with Industry practice.

A19: See below.

Q4: Reference Addendum 9, Question 24.

Q12: Reference Addendum 12, Question 13.

Q14: Reference Addendum 12, Item No. 1.1.

Q15: Reference Addendum 12, Question 13, 14, and 16.

Q16: Reference Addendum 12, Question 13.

Q17: Reference Addendum 9, Question 22.

Q18: Reference Addendum 9, Question 22.

Q19: Reference Addendum 9, Question 22.

Q20: Reference Addendum 9, Question 24.

Q21: Reference Addendum 12, Question 15.

Q22: As stated in response to Addendum 5, Question 22, "Article 3.32.B.1 does not state fully quantified claim."

Q23: Reference Addendum 12, Question 16.

Q24: Reference Addendum 12, Question 16.

Q25: Reference Addendum 12, Question 15.

Q26: No change.

Q29: Reference Addendum 5, Question 27.

No change. This is a public project; thus, this question is certainly not in the best interest of the ratepayers of Allegheny County.

Q32: Reference Addendum 12, Question 18.

Q34: Reference Addendum 12, Question 18.

Q35: Reference Addendum 12, Question 18.

Q36: No change.

Q37: Reference Addendum 12, Item No. 1.2.

Q38: Reference Addendum 11, Item No. 1.1.

Q39: No change.

Q40: Reference Addendum 12, Question 18.

Q41: As stated in response to Addendum 5, Question 41, "Reference Article 3.60.A's fourth paragraph." Also, reference Addendum 12, Question 18.

Q42: No change.

Q43: No change.

Q44: No change. This is a public project; thus, this question is certainly not in the best interest of the ratepayers of Allegheny County.

Q46: Reference Addendum 10, Item No. 1.1.

Q47: Reference Addendum 10, Item No. 1.1 and 1.2.

Q48: This question excluded the beginning of the sentence that reads, "If the foregoing order of precedence fails to resolve the conflict or discrepancy..."

If an item is not resolved by the order of precedence that is described right before this sentence, then the Contractor must submit a Request for Information per Article 3.31 and Specification 01 26 13.

Q49: Reference Addendum 10, Item No. 1.2.

Q50: Reference Addendum 12, Question 13.

Q51: Reference Addendum 12, Question 17.

Q53: Reference Addendum 5, Question 53 for previous response.

Q54: Reference Addendum 10, Items 1.3-1.6.

Q55: Reference Addendum 10, Items 1.3-1.6.

Q56: Reference Addendum 10, Items 1.3-1.6.

Q57: Reference Addendum 10, Items 1.3-1.6.

Q58: Reference Addendum 10, Items 1.3-1.6.

Q60: Reference Addendum 10, Items 1.3-1.6.

END OF ADDENDUM No. 12

ATTACHMENT – A

Addendum No. 12 Specifications

SECTION 01 11 00
SUMMARY OF WORK

PART 1 GENERAL

1.01 GENERAL

A. General:

1. It is the intent of the Contract Documents to describe a functionally complete project.
2. The work included in this project is at the Allegheny County Sanitary Authority (ALCOSAN) Woods Run Wastewater Treatment Plant in Pittsburgh, PA and is described in detail in the rest of this section.
3. Furnish all labor, materials, tools, equipment and services as indicated in accordance with provisions of Contract Documents.
4. Furnish and install all supplementary or miscellaneous items, appurtenances, and devices incidental to or necessary for a sound, secure, complete, and functional installation of the work.
5. In addition to this individual project, there will be construction activities underway at the plant site during part or all of the construction period for this project.
6. Work areas shall be confined to areas specifically designated for the Wet Weather Pump Station Project on the Site Utilization Plan.

B. Contract No. 1800 will be executed by four Prime Contractors according to the requirements of the Contract Documents. The following parties may be present at the job site and have the responsibilities described generally in Article 3, Contract Provisions:

1. ALCOSAN (Owner)
2. Construction Manager (CM) (Michael Baker International)
3. Consulting Engineer (Brown and Caldwell)
4. Prime Contractor(s)
5. Fabricators and supplier(s)
6. Testing agencies
7. Commissioning firms
8. Other project stakeholders

C. Owner:

1. The Owner may be identified as the responsible entity for certain actions in the sections of Divisions 2 through 46. The Owner may elect to delegate certain of these respective duties and responsibilities to the aforementioned parties.
2. All contact between the Contractor(s) and the remaining aforementioned parties shall be through the Construction Manager.

D. Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this contract. Coordinate the work of this contract with work performed under separate contracts.

1.02 WORK COVERED BY CONTRACT

- A. The work includes, but is not necessarily limited to, the following. However, this description is in no way meant to limit or restrict the work required under the contract. Refer to the Contract Drawings and the remainder of the specifications for additional detail on the Scope of the Work. All Contractors are responsible to review the entire set of Contract Documents and Contract Drawings to familiarize themselves with the entire project.
1. General Construction, Contract G.
 2. Electrical Construction, Contract E.
 3. HVAC Construction, Contract H.
 4. Plumbing Construction, Contract P.
- B. General Construction, Contract No. 1800G:
1. Site preparation, including clearing, building demolition and relocation.
 2. Provide temporary geotechnical monitoring systems and upon completion of work, decommission and remove systems.
 3. All excavation, test pits, temporary support of excavations (SOE), control of groundwater and infiltration, bedding and backfill required for all work included in the 1800 G, E, H and P contracts. Temporary SOE for ductbanks shall minimize ductbank dimensions to extent practical.
 4. Temporary facilities including site sanitary, site construction entrances and wheel wash.
 5. Relocation of Construction Manager field office.
 6. Demolition of existing structures, pavements, piping, sheeting, temporary lagging, soldier piles and other site features.
 7. Demolition of existing abandoned electrical substation infrastructure including cable tray support structure.
 8. Demolition of abandoned diesel and fuel oil storage facility containment area (410) foundation inclusive of piles and miscellaneous infrastructure.
 9. Demolition and removal of existing duct banks, power, control, communication utilities after new utilities have been terminated and feeders and conductors removed by Electrical Contractor as part of Contract No. 1800E.
 10. Demolition of existing foundations for site light poles.
 11. Demolition, handling, and disposal of hazardous materials identified in the Reference Information.
 12. Temporary bulkheads and weirs as required for equipment and structure installation.
 13. Site grading, landscaping, concrete, asphalt and gravel paving, bollards, curbing, erosion and sediment control provisions, and stormwater collection systems.
 14. Modifications to site utilities, including storm and sanitary sewers, natural gas, potable water supply, fire water lines, fire hydrants and distribution lines up to a point 5 feet outside the building. Coordinate with Contract No. 1800P for continuation into building.
 15. Demolition, relocation, modifications and new site utilities and coordination with Contract 1800E utilities.
 16. Demolition, relocation, modifications and new process piping systems.

17. Effluent Flush Water supply piping, valves, and supports, hose bibbs (connected to Effluent Flush Water service), hydrants, and water cannons.
18. In accordance with OSHA regulations Title 29 of the Code of Federal Regulations (CFR) and General Provisions of Pennsylvania Code Chapter 43, Subchapter A, all excavations for the Wet Weather Pump Station, including excavations physically connected to the WWPS excavation or extending into bedrock, shall be classified as underground shaft, tunnel, chamber, cut and cover excavations, and passageways in accordance with 29 CFR 1926, Subpart S. Additionally, these excavations shall be classified as "potentially gassy" in accordance with 29 CFR Section 1926. Contractor shall supply all equipment and personnel, and perform all shaft, tunnel, and adjacent excavation work in accordance with applicable provisions of 29 CFR Section 1926.800. Contractor shall ensure emergency provisions are provided and rescue services and procedures, including the use of breathing apparatus and self-rescuers, are provided in accordance with 29 CFR 1926.800 where appropriate.
19. Construction and connection of new Wet Weather Pump Station effluent conduit to connect to existing 120-inch diameter East Headworks Influent Conduit. Drainage of East Headworks Influent Conduit to complete Contract 1800G tie-in. Disposal of abandoned existing 90-inch diameter PCCP cap and 120-inch x 96-inch diameter PCCP reducer stored at grade near the West Headworks.
20. Construction of new Wet Weather Pump Station including Support of Excavation (SOE), shaft liner, foundations, superstructure, and all architectural appurtenances.
21. Slurry wall, rockbolts, grouting, deep foundation piles, steel sheet piling.
22. Construction of initial support, Tunnel Junction Chamber, portion of Dewatering Tunnel and temporary bulkhead at tie-in to the Ohio River Tunnel Contract 1797 Dewatering Tunnel.
23. Removal of temporary bulkhead and CLSM at tie-in to the Ohio River Tunnel Contract 1797 Dewatering Tunnel depending upon the Alternate Bid Item required by the Construction Manager and Owner.
24. All equipment and housekeeping pads for equipment provided by Contract 1800E, H and P. Contract 1800G shall coordinate locations, sizes, and orientation with the installing contractor for the equipment to be supported on the respective pads.
25. All odor control system components, inclusive of the systems specified under:
 - a. Section 23 31 16
 - b. Section 23 33 19
 - c. Section 43 11 19.13
 - d. Section 43 41 45.16
 - e. Section 44 31 14
 - f. Section 44 31 16
26. Connect foul air duct work serving the Screening Room and Dumpster Area provided under Contract 1800G to a roof-mounted HVAC fan provided under Contract 1800H. Contractor 1800G shall include air balancing of the odor control system and coordinate where the system components connect to Contract 1800H work.
27. Furnish OEM control panels and variable frequency drives (VFD)s for designated equipment, consistent with the functional control descriptions listed in the specifications. Furnish OEM control panels for designated equipment as specified in Divisions 8, 40, 41, 43, 46, consistent with the functional control descriptions listed in the specifications. Furnish Variable Frequency Drives (VFDs) for designated equipment

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as specified in Divisions 43 and 46, consistent with the functional control descriptions listed in the specifications. Furnish and install OEM control panel associated with the elevator systems specified in Division 14.

28. Furnish all and install all field-mounted instruments.
29. Furnish associated manufacturer's proprietary cable and wiring for field-mounted instruments required to put instruments into service, consistent with the functional control descriptions listed in the specifications.
30. Provide calibration for all field mounted instruments.
31. Provide all temporary electrical energy required by Contract No. 1800G means and methods for the execution of the work. Limited temporary electrical energy is available for shared use by Contracts 1800G, 1800E, 1800H and 1800P and the point of available are described in Section 01 50 00.
32. Provide any additional temporary electrical energy required by Contract No. 1800G means and methods for the execution of the work, that exceeds the limited temporary electrical energy made available by the Owner. This includes but it is not limited to temporary generators, fuel, disconnects, cabling and other electrical infrastructure.
33. Provide all temporary heating, ventilation and cooling required by Contract No. 1800G means and methods for the execution of the work.
34. Provide and maintain construction entrance on Tracy Street.
35. Provide weekly (at a minimum) street sweeping all roads, walkways, and parking lots interior to the plant within the Contract 1800G Limits of Disturbance (LOD) for the duration of the contract. Street sweeping shall be by means of wet vacuum street sweeper. Power brooms are not acceptable.
36. Provide regular snow plowing as necessary of all roads, walkways, and parking lots interior to the plant within the Contract 1800G LOD.
37. Other items as indicated on the Contract Documents and generally as shown on the following Drawings:
 - a. "General" drawings, designated as:
 - 1) XXX-G-XX
 - b. "Geotechnical" drawings designated as"
 - 1) XXX-GT-XX
 - c. "Support of Excavation" drawings designated as"
 - 1) XXX-SOE-XX
 - d. "Civil" drawings, designated as:
 - 1) XXX-C-XX
 - 2) XXX-CDM-XX
 - 3) XXX-CD-XX
 - e. "Structural" drawings, designated as:
 - 1) XXX-S-XX
 - 2) XXX-SD-XX
 - f. "Mechanical" drawings, designated as:
 - 1) XXX-M-XX
 - 2) XXX-MD-XX
 - g. "Architectural" drawings, designated as:

- 1) XXX-A-XX
- 2) XXX-AD-XX
- 3) XXX-AS-XX

h. "Piping and Instrumentation Diagrams" and associated details, designated as:

- 1) XXX-I-XX
- 2) XXX-ID-XX

C. Electrical, Contract No. 1800E:

1. Develop and submit an Electrical Infrastructure Report to document existing conditions.
2. Terminate and disconnect site electrical power, control, communication within ductbanks and manholes. Material to be demolished by General Contractor as part of Contract 1800G. Where scheduled, terminate power and remove existing feeders and conductors prior to duct bank demolition by General Contractor under Contract 1800G.
3. Demolition, relocation, modifications and new site electrical utilities.
4. Provide communication, control, 480V, 5kV and 15kV duct banks, electrical manholes, feeders, conductors, and associated conduit.
5. Provide concrete encasement and reinforcing of ductbanks and manholes.
6. Provide dewatering of electrical manholes and substation vaults.
7. Coordinate Contract 1800E ductbank and manhole work with test pits, excavation, bedding and management/control of groundwater by Contract 1800G.
8. Provide new site lighting, including new poles and concrete foundations where applicable.
9. Provide electrical conduit and wiring for Contract 1800G, H and P contract equipment.
10. Provide conduit, wire and field connections for Division 26 equipment and systems.
11. Where power and subsequent equipment are in Divisions other than a Division 26 work, provide conduit, wire and field connection from power source to disconnect switch and network related connection switch. Conduit, wire and field connections from disconnect switch provided under Contract No. 1800E and network related connection for motors, controllers, devices, panels, filters, transformers, indicators and related equipment shall be provided by the appropriate contractor as specified, unless otherwise indicated in the Contract Documents.
12. Provide building lighting.
13. Provide wiring and termination of all field-mounted instruments.
14. Install manufacturer's proprietary cable and wiring for field-mounted instruments furnished under Contract 1800G, required to put instruments into service, consistent with the functional control descriptions listed in the specifications.
15. Install ventilation failure monitoring system panels furnished by Contract 1800H.
16. Provide 120VAC conduit and cabling for ventilation failure monitoring system panels and DDC system components, including power terminations.
17. Provide conduit and wiring of fire alarm equipment.
18. Provide MCCs, transformers, UPS, panels, circuits, wiring, and conduit.
- ~~19. Install VFDs and control panels furnished under Contract 1800G except for:~~

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- a. ~~VFDs for Submersible Pumps Variable Speed which shall be furnished and installed under Contract 1800E.~~ Install OEM control panels and Variable Frequency Drives for equipment furnished under Contract 1800G, 1800H and 1800P with the following exceptions:
 - 1) Pendent/radio controls associated with Div 41.
 - 2) Skid mounted OEM control panels and Variable Frequency Drives for equipment provided under Divisions 22 and 23.
 - 3) Temperature control /networked DDC system panels furnished under Division 23.
- 20. Provide electrical control panels, IT Network enclosures, disconnects, switches, starters, and other electrical devices in the Contract Documents. Equipment shall be consistent with the functional control descriptions listed in the Specifications.
- 21. Provide grounding grids and yard cable.
- 22. Installation of Owner-provided DPUs.
- 23. Connection of cabling to Owner-provided patch panel enclosures.
- 24. Provide wiring of telecommunication, fiber, network switches and electrical enclosures including wiring of Power Over Ethernet for video cameras.
- 25. Provide all Distributed Antenna Systems, cameras, radio antenna wiring, poles and mounts and all appurtenances equipment required for video cameras and radio where applicable to effect a complete and functional system.
- 26. Provide heat trace systems including cable, wiring and controllers, panels, circuits, wiring, and conduit.
- 27. Provide fire alarm equipment, devices, hangers, supports, conduit and wiring.
- 28. Testing of electrical equipment.
- 29. Provide power to all field office trailers.
- 30. Provide electrical work associated with relocation of Construction Manager field office.
- 31. Temporary electrical power service and distribution, lighting, communications data, electrical connections to maintain existing systems, facilities and controls,
- 32. Provide any additional temporary electrical energy required by Contract No. 1800E means and methods for the execution of the work, that exceeds the limited temporary electrical energy made available by the Owner. This includes but it is not limited to temporary generators, fuel, disconnects, cabling and other electrical infrastructure.
- 33. Provide all temporary heating, ventilation and cooling required by Contract No. 1800E means and methods for the execution of the work.
- 34. Other items as indicated on the Contract Documents and generally as shown on the following Drawings:
- 35. "General" drawings, designated as:
 - a. XXX-G-XX
- 36. "Electrical" drawings, designated as:
 - a. XXX-EDM-XX
 - b. XXX-E-XX
 - c. XXX-ESP-XX
 - d. XXX-ED-XX

- e. XXX-ESL-XX
- f. XXX-EP-XX
- g. XXX-ET-XX
- h. XXX-ELP-XX
- i. XXX-EM-XX
- j. XXX-ER-XX

D. Contract No. 1800H:

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1. Provide HVAC related fans, air handlers, make-up air units, unit heaters, ductless split system air conditioning units, heat exchangers, and HVAC units, diffusers, registers, grilles and ductwork. Where integral to the equipment skid, furnish and install OEM control panels and Variable Frequency Drives for equipment specified in Divisions 22 and 23. Where separate from the equipment skid, furnish OEM control panels and Variable Frequency Drives for equipment specified in Divisions 22 and 23 for installation by Contract 1800E.
2. Provide networked DDC system, integration and programming.
3. Furnish ventilation failure system monitoring panels for installation by Contract 1800E.
4. Provide all low voltage control wiring, conduit and terminations for DDC systems inclusive of ventilation failure monitoring system components, including terminations.
5. Provide heating water and refrigerant piping associated with HVAC equipment.
6. Provide natural gas piping systems and associated equipment from connection with the 1800G contract site natural gas piping. Provide natural gas piping connection within Building 410.
7. Coordinate size of required HVAC housekeeping pads with Contract 1800G.
8. Provide hangers and supports associated with HVAC equipment.
9. Provide insulation for HVAC systems.
10. Provide piping between and from HVAC equipment.
11. Provide HVAC work associated with relocation of Construction Manager field office.
12. Provide any additional temporary electrical energy required by Contract No. 1800H means and methods for the execution of the work, that exceeds the limited temporary electrical energy made available by the Owner. This includes but it is not limited to temporary generators, fuel, disconnects, cabling and other electrical infrastructure.
13. Provide all temporary heating, ventilation and cooling required by Contract No. 1800H means and methods for the execution of the work.
14. Other items as indicated on the Contract Documents and generally as shown on the following Drawings:
 - a. "General" drawings, designated as:
 - 1) XXX-G-XX
 - b. "HVAC" drawings, designated as:
 - 1) XXX-H-XX
 - 2) XXX-HS-XX
 - 3) XXX-HD-XX

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E. Contract No. 1800P:

1. Provide plumbing, fire protection and miscellaneous support work and systems. Furnish control panel systems for elevator pit sump pump for installation by Contract 1800E.
2. Provide floor drains, cleanouts, vents and sanitary sewer piping to the connection with the 1800G contract 5 feet outside the building.
3. Provide roof drains to the connection with the 1800G contract at cleanouts outside of superstructure.
4. Installation of natural gas line from point of connection to equipment.
5. Provide plumbing work associated with relocation of Construction Manager field office.
6. Provide Wet Weather Pump Station building plumbing supply piping, valves, and supports, toilet room fixtures, water meter, backflow preventers, water heaters, hose bibbs (connected to PCW service), wall hydrants, and roof hydrants.
7. Provide insulation and jacket for potable water pipes, fittings, valves and equipment.
8. Provide condensate drain piping associated with air handling units and ductless split systems from equipment to point of discharge.
9. Temporary plumbing connections to existing systems and temporary facilities and controls furnished by Contracts 1800 G, E and H.
10. Provide potable water main and fire protection service to the connection point with the 1800G contract 5 feet outside the building.
11. Provide hangers and supports associated with plumbing and fire protection equipment.
12. Coordinate size of required plumbing housekeeping pads with Contract 1800G.
13. Provide fire protection piping, hangers and supports, valves, backflow preventer and sprinklers.
14. Provide insulation and jacket for potable water pipes, fittings, valves, and equipment.
15. Provide any additional temporary electrical energy required by Contract No. 1800P means and methods for the execution of the work, that exceeds the limited temporary electrical energy made available by the Owner. This includes but it is not limited to temporary generators, fuel, disconnects, cabling and other electrical infrastructure.
16. Provide all temporary heating, ventilation and cooling required by Contract No. 1800P means and methods for the execution of the work.
17. Other items as indicated on the Contract Documents and generally as shown on the following Drawings:
 - a. "General" drawings, designated as:
 - 1) XXX-G-XX
 - b. "Plumbing" drawings, designated as:
 - 1) XXX-P-XX
 - 2) XXX-PD-XX
 - 3) XXX-PS-XX
 - c. "Fire Protection" drawings, designated as:
 - 1) XXX-F-XX

1.03 WORK SEQUENCE

- A. Organize and plan the construction activities to assure the safety and reliability of and to minimize the interruption to the plant operations and performance.
- B. The proposed work sequence shall be submitted to the CM in accordance with Section 01 32 16, Construction Progress Schedule.

1.04 WORK BY OWNER AND COORDINATION

- A. Owner's Responsibilities:
 - 1. Operation of all valves and gates as needed to complete work.
 - 2. Draining, to Owner standards, of Main Pumping Station overflow structures and effluent conduit as needed to facilitate Contractor to complete Work.
 - 3. Unless otherwise specified, the Owner will partially drain by gravity, the existing tanks, conduits and channels which require access by the Contractor. Not all existing tanks, conduits and channels can be completely drained, and the Contractor shall expect two to three feet of water which may contain sludge, grit, and sewage depending on the drain layout.
 - a. Contractor shall be responsible for all additional temporary means, subject to Owner approval, to dewater, dispose and clean or hosing of the tanks, conduits and channels specified and as necessary to perform their scope of work.
 - b. Solids removed can be disposed of at the plant (typically in the ash pits that are located along the river near the Main Pump Station).
 - c. Liquids or washwater that needs to be removed can utilize the plant drainage system. Contractor shall notify the CM prior to disposal of any solids.
 - d. Watertight tanks, gates, valves and stop logs are not guaranteed, and Contractor shall provide measures required for an environment suitable for the Contractor to perform the work.
 - e. After the initial tank draining, Contractor will be responsible for temporary measures required to keep the tanks suitable for Contractor's use.

1.05 OWNER OCCUPANCY

- A. Owner will occupy the premises during the entire period of construction for the conduct of his normal operations. Coordinate with Owner in all construction operations to minimize conflicts and to facilitate Owner usage.
- B. Execute Certificate of Substantial Completion for each area all systems installed and commissioned as described in Article 1.2.
 - 1. After Owner occupancy, allow:
 - a. Access for Owner's personnel.
 - b. Access for the public.
 - c. Operation of area process, HVAC, plumbing and electrical systems.
 - 2. After occupancy, Owner will provide:
 - a. Contractor access to finish punch list items.

- b. Access to area process, HVAC, plumbing, and electrical systems for Contractors to perform warranty work.

1.06 OUTAGES

- A. Organize and plan the construction activities so that the number and length of any required outages shall be minimized.
- B. All outages shall require specific approval of the Owner. The Owner reserves the right to reject any request for an outage.
- C. In some cases, it may be necessary, at Contractor's expense, to either install temporary facilities for service or schedule the work during a period when the outage would have minimal impact on the Owner.
- D. Provide the Owner at least 14 days' notice in advance of any requested outage so that the Owner may advise and coordinate the outage with the customers.

1.07 OWNER-FURNISHED PRODUCTS

- A. Products furnished and paid for by Owner shall be as follows:

Product	Comment	Section
Operator Workstation	Equipment Tag OP-CON-430	
DPU enclosure	Contractor shall install the Owner-furnished DPU enclosure. Terminations shall be per manufacturer's recommendations and as specified and shown in the Contract Documents project documentation.	Section 40 68 00, Distributed Control System (DCS)
Ethernet switches	Contractor shall install Owner-furnished ethernet switches. Contractor shall provide the respective IT/network enclosure(s) as specified and shown in the Contract Documents. Contractor shall be responsible for providing a fully functional control system fully integrated into the existing plant control system.	Section 40 66 13, Ethernet Switches

1.08 CONTRACTOR-FURNISHED PRODUCTS

- A. Furnish all products other than Owner-furnished products designated above.

- B. Components required to be supplied in quantity within a specification section shall all be the same and shall be interchangeable.
- C. Unless otherwise indicated in the Contract Documents, provide materials and equipment that:
 - 1. Are produced by reputable manufacturers having adequate experience in the manufacture of these items;
 - 2. Are designed for the service intended;
 - 3. Have not been previously incorporated into another project or facility;
 - 4. Have not changed ownership since their initial production or fabrication and shipment from the manufacturer's factory or facility;
 - 5. If stored since their manufacture or fabrication, have, while in storage, been properly maintained and serviced in accordance with the manufacturer's recommendations for long-term storage. Submit documentation under the relevant technical section that such maintenance and service has been performed.
 - 6. Have not been subject to degradation or deterioration since manufacture.
 - 7. Are the current model(s) or type(s) furnished by the supplier and only modified as necessary to comply with the design.

1.09 UNDERGROUND UTILITIES

- A. Notify Call Before You Dig at 811 or 800-242-1776 before excavation. Contractor shall take all precautions and utilize all facilities required to protect existing utilities and structures in compliance with PA One Call System Requirements and Guidelines, Act 121 of the General Assembly of Pennsylvania and the Common Ground Alliance Best Practices Manual
- B. Consult ALCOSAN Engineering Department for access to underground utility record drawings.
- C. Utilities known to the Engineer who have underground facilities in the vicinity of the work may be contacted as follows:
 - 1. Windstream 855-849-5248
 - 2. CenturyLink 610-572-4887
 - 3. Gas - Peoples Natural Gas – 886-654-4660
 - 4. Electric – Duquesne Light Company 412-393-7300
 - 5. Water – Pittsburgh Water 412-255-2423

1.10 PERMITS AND LICENSES

- A. The Owner has applied for and obtained, at Owner's expense, the following permits and approvals for the work:
 - 1. PADEP General NPDES Permit for Stormwater Discharges Associated with Construction Activities (PAG-02)
 - 2. PADEP Water Quality Management Permit- Part II
 - 3. City of Pittsburgh Stormwater Permit –SWP-2025-00437
 - 4. City of Pittsburgh Curb Cut Permit – DOMI-CC-2025-02395

5. City of Pittsburgh Floodplain Permit – FP-2025-00984
 6. City of Pittsburgh Building and Development Application BDA-2024-05947
 7. Allegheny County Health Department (ACHD) Air Permit Request for Determination
- B. The pertinent Prime Contractor shall obtain, at his expense, all other permits and licenses necessary for the construction of the Work in accordance with the General Conditions.
1. City of Pittsburgh Permits, Licenses, and Inspections - Land Operations Permit
 2. City of Pittsburgh Permits, Licenses, and Inspections - Building Permit (finalize BDA-2024-05947, DCP and PLI reviews will be completed by FDC)
 3. City of Pittsburgh Permits, Licenses, and Inspections – HVAC Permit
 4. City of Pittsburgh Permits, Licenses, and Inspections – Electrical Permit
 5. City of Pittsburgh Permits, Licenses, and Inspections - Fire Alarm Permit
 6. City of Pittsburgh Permits, Licenses, and Inspections – Suppression System Permit
 7. City of Pittsburgh Permits, Licenses, and Inspections – Demolition Permit
 8. City of Pittsburgh Fire – Fireworks and Explosions
 9. PADEP Blasting Activity Permit
 10. PADEP Water Allocation Application and Daily Water Withdrawal Report
 11. Allegheny County Health Department (ACHD) – Plumbing Permit
 12. The following amounts have been paid to date by the Owner:
 - a. \$ 16,000 review fee City of Pittsburgh Building and Development Application BDA-2024-05947
 - b. \$1,350.00 Planning Commission review fee City of Pittsburgh Building and Development Application BDA-2024-05947
 - c. \$2,537 Planning and PLI review fee for exemption City of Pittsburgh Stormwater Permit SWP-2025-00437.
 - d. \$852 review and issuance fee City of Pittsburgh Curb Cut fee DOMI-CC-2025-02395
 - e. \$270.00 review fee City of Pittsburgh Floodplain Permit FP-2025-00984
- C. The General Contractor shall obtain, at his expense, co-permittee status for Owner-obtained permits for the Work:
1. PADEP General NPDES Permit for Stormwater Discharges Associated with Construction Activities (PAG-02).
- D. Obtain all other permits and licenses necessary for the construction of the work in accordance with Article 3.11 of the General Conditions.

1.11 ACCESS BY GOVERNMENT OFFICIALS

- A. Authorized representatives of governmental agencies shall at all times have access to the work.

1.12 FENCES

- A. All fences affected by the work shall be maintained by the Contractor until completion of the work. Fences disturbed by the construction shall be restored immediately by the Contractor to their original or better condition and to their original location unless otherwise indicated or directed.

1.13 LEAD- AND ASBESTOS-CONTAINING MATERIALS (ACM)

- A. Lead containing paint may be present at the site and are within the scope of the work for which Contractor shall be responsible. Lead containing paint removal must be performed within compliance with EPA regulations. Should lead-based paint be discovered, stop work in the area of possible contamination and notify Owner.
- B. Materials containing less than or equal to 1 percent asbestos may be present in the work area. Handling/removal of this material must be performed within compliance with any applicable EPA or OSHA regulations. ACM is not expected in the work area. Should ACM be discovered, stop work in the area of possible contamination and notify Owner.

1.14 CONFINED SPACES

- A. All work involving confined space entry will be in accordance with 29 CFR 1926 Subpart AA – Confined Spaces in Construction. The Owner has adopted a Permit Required Confined Space Entry Program for its employees in accordance with OSHA requirements found at 29 CFR 1910.146. This permit Required Confined Space Entry Program must be adopted by the Contractor if its employees will be working in confined spaces. No Contractor employee shall be permitted to enter a “Permit Required Confined Space” as defined in 29 CFR 1926.1202 without having complied with all of the requirements of said regulations, including the sign-off on the “Owner On-Site Confined Space Entry Permit” adopted by the Contractor. The Contractor shall have gas detection equipment, which is capable of detecting combustibles, oxygen, hydrogen sulfide, and carbon monoxide.
- B. The following work areas within the contract are defined as Confined Space:
 - 1. Manholes, Vaults and Junction Boxes
 - 2. Main Pump Station Overflow Structure
 - 3. WWPS Wet Well and Junction Chamber
 - 4. WWPS Discharge Chamber and Effluent Conduit
- C. The Contractor shall comply with the requirements of the applicable Permit Required Confined Space Entry Program whenever the potential exists that work in such spaces could be hazardous. Any work involving confined space entry will be in accordance with OSHA requirements as presented in 29 CFR 1926 Subpart AA – Confined Spaces in Construction and OSHA 29 CFR 1926, Subpart S for safety requirements. Contractor’s personnel must not enter any areas identified by Owner as confined spaces without first receiving written approval from the responsible Owner Shift Superintendent and without first having complied with all the requirements of said regulations. This includes the sign-off on the "Owner On-Site Confined Space Entry Permit" or equivalent permit adopted by the Contractor.

- D. If confined space entry is required, the Contractor shall supply personal protective equipment (PPE) and gas detection equipment, which is capable of detecting combustibles, oxygen, hydrogen sulfide and carbon monoxide.
- E. The Contractor shall identify to the Construction Manager any new confined or enclosed space that is created as a result of the performance of the contract work. The Contractor shall comply with the requirements of the applicable permit-required confined space entry program whenever the potential exists that work in such spaces could be hazardous

1.15 DESCRIPTION OF PROJECT PERSONNEL AND THEIR RESPONSIBILITIES

- A. Contractor's Personnel: As described in these Contract Documents and as follows:
 - 1. Project Manager and Site Superintendent must be on site at all times when work in individual contract area is proceeding. The Owner reserves the right to approve the Contractor's proposed Project Manager and Site Superintendent. If at any time during the execution of the Contract the Owner determines that the Contractor's Project Manager or Site Superintendent is not executing the work in conformance with the Contract Documents, the Owner may request in writing that he/she be replaced. Contractor will not replace the Project Manager or Site Superintendent without written notice to Construction Manager except under extraordinary circumstances. The Project Manager or Site Superintendent will be Contractor's representative at the site and shall have the authority to act on behalf of Contractor. All communications to the Project Manager or Site Superintendent shall be as binding as if given to Contractor. If at any time during the Project the Project Manager or Site Superintendent must leave the project site while work is in progress, the Construction Manager shall be notified and provided with the name of the Contractor's representative having responsible charge.
 - 2. Quality Control Representative will be responsible for Contractor's quality control program while work is in progress. Notify the Construction Manager of any change in quality control assignment.
 - 3. Safety and Protection Representative:
 - a. Contractor shall designate a qualified and experienced Safety Representative at the site whose duties and responsibilities shall be to prevent accidents and to maintain and supervise the implementation of the Contractor's Safety Plan. The Safety Representative shall be trained in First Aid and CPR. The Safety Representative's qualifications shall be submitted to the Construction Manager prior to beginning work on site.
 - b. Initiate, maintain, and supervise the safety plan in connection with the work. Take all necessary precautions for safety and provide for the necessary protection to prevent damage, injury, or loss to:
 - 1) All persons on the work site or who may be affected by the work;
 - 2) All the work and materials and equipment to be incorporated therein, whether in storage on or off the site; and
 - 3) Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and underground facilities not designated for removal, relocation, or replacement in the course of construction.

- c. Comply with all applicable laws and regulations of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss.
- d. Before any work at the site is started, the Contractor shall prepare a written project Site-Specific Safety Plan and submit to the Construction Manager for record. The **Site-Specific Safety Plan** must follow the template attached to this specification. If it does not, the Owner will return it for revisions. See **Appendix A** at the end of this specification for the template.
- e. The Safety Representative shall revise the Safety Plan at appropriate times to reflect changes in construction conditions, the work, Contractor's means, methods, techniques, sequences and procedures of construction. The Safety Representative will submit the revised Safety Plan to the Construction Manager for record.
- f. Contractor's personnel are obligated to act, without direction or authorization from Owner or Construction Manager, to prevent any potential injury or property loss when confronted with any emergency situation affecting the safety or protection of persons or the work or property at the site or adjacent thereto.
- g. Contractor shall give Construction Manager prompt written notice if Contractor believes that any significant changes in the work or variations from the Contract Documents have been caused by any unforeseen emergency situation. If Construction Manager determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, Construction Manager will proceed in accordance with Article 3, Contract Provisions.
- h. In emergencies affecting the safety or protection of persons or the work or property at the site or adjacent thereto, each Contractor, without special instruction or authorization from Owner or Construction Manager, is obligated to act to prevent threatened damage, injury or loss. Contractor shall give Construction Manager prompt written notice if Contractor believes that any significant changes in the work or variations from the Contract Documents have been caused thereby. If Construction Manager determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, Construction Manager will proceed in accordance with Article 3, General Contract Conditions.
- i. Contractor shall take precautions to prevent any materials related to the work from falling into active process tanks such as the aeration basins, secondary clarifiers, primary sedimentation basins, etc. It will be the Contractor's responsibility to retrieve any such debris at his own expense with assistance from ALCOSAN. Contractor may be back-charged ALCOSAN's costs for assistance in retrieving Contractor debris from process tanks.

B. Owner: As described in these Contract Documents and as follows:

- 1. Can enter into legal contract with Contractor for completion of the work.
- 2. Can approve contract amendments, progress payments, and make final acceptance of the work.
- 3. Can participate in coordination of site construction activities.
- 4. Can participate in training, testing and startup activities.

C. Construction Manager (CM): As described in these Contract Documents and as follows:

1. Inspect and monitor Contractor progress and quality of work during all structural, mechanical and electrical construction work.
 2. Contractor shall provide all required assistance for the CM's inspection of the work.
 3. Make available for the use of Contractor, copies of all existing information in the possession of the Construction Manager, which may be pertinent to the performance of Contractor services under the Scope of work
 4. Assist Contractor in obtaining access to all work sites through within the plant.
 5. Provide on-site representative and construction inspection services
 6. Coordinate training, testing and startup activities.
- D. Engineer: As described in these Contract Documents and as follows:
1. Performs weekly site inspections.
 2. Provides engineering support services including RFI responses.
 3. Reviews technical submittals and shop drawings.
 4. Prepares drawing revisions and cost estimates.
 5. Provides drawing and submittal control.
 6. Provides technical supervision of startup activities
 7. Assists in training, testing and startup activities.
 8. Provide on-site representative and construction inspection services when requested by the Owner.
- E. Supplier (Material and Equipment): As described in these Contract Documents and as follows:
1. Will provide submittals and operation and maintenance manuals for equipment and material as specified.
 2. Will perform on-site training
 3. Will provide commissioning and start up services
 4. Will provide engineering support services during commissioning

PART 2 PRODUCTS - (NOT USED)

PART 3 EXECUTION - (NOT USED)

Attachments:

Appendix A

- Site-Specific Safety Plan (SSSP) Template
- Post-incident Report

END OF SECTION

SITE SPECIFIC SAFETY PLAN (SSSP) TEMPLATE

Cover Page

- ☐ Company Name
- ☐ Address or coordinates
- ☐ Site Specific Safety Plan
- ☐ Project Name/Number
- ☐ Date

Table of Contents

1. **Purpose**
2. **Scope of Work**
 - a. Identify steps of the work
 - b. Hours of Operation Project
3. **Site Specific Safety Plan**
 - a. Spill Leak Prevention and Response
 - i. Identify location of Chemical Inventory (SDSs) – ex: Tool Trailer, Job Office, Foreman Truck
 - b. Hazard Recognition and Mitigation (Define **all project** hazards and steps to mitigate)
 - i. **Examples:**
 - a) Hot Work
 - b) Confined Space Entry
 - c) Fall Hazard Control and Protection
 - d) Arc Flash Protection (70E) using correct PPE
 - c. Minimum Required PPE
 - d. Fire Control
 - e. Dust Control
 - f. Housekeeping Program
 - g. Evacuation Plan
 - h. Rescue Plan
 - i. Traffic Control – School Bus Curfews, Speed Limits, etc.
 - j. Utility Locate Verification (if applicable)
 - k. COVID-19 Plan (consistent with ALCOSAN protocols)
 - l. Shaft Access (Tag In / Tag Out) Plan
4. **Contact information – Names / Contact Info.**
 - a. Contractor
 - i. Operations Manager
 - ii. Project Supervisor
 - iii. Safety Manager
 - iv. Foreman
 - b. Subcontractor(s)

- i. List Company Name and Contact Person
- c. ALCOSAN
 - i. Engineers
 - ii. Construction Manager
 - iii. Loss Control Manager
 - iv. Safety Specialist
 - v. Security

5. Injury and Incident Response Plan

- a. Owner Emergency Procedures/Notification
 - i. All cases
 - ii. First aid cases
 - iii. Severed or life-threatening injuries
- b. Important information
 - i. GPS Coordinates
 - ii. Emergency Contact Information
 - a) Hospital(s) Contact Information
 - a. Map – Route to Hospital

6. Training – What types of work should include specific regulatory training

- a. Examples:
 - i. Hot work
 - ii. Confined Space
 - iii. Fall Protection
 - iv. Hazard Communication
 - v. LOTO
 - vi. Housekeeping
 - vii. Equipment

7. Acknowledgment Form

- a. “I acknowledge the SSSP for _____ has been reviewed and explained to me”

Note: Plan to be reviewed with General Contractor and Subcontractors

- i. Print name
- ii. Signatures
- iii. Date

8. Attachments

- a. Training Documents for specific work listed
- b. Safety Data Sheets (SDS) for all chemicals brought onto site
- c. Proof of CCO certification for all crane operators
- d. Required blank (contractor owned) forms to be completed
 - i. Examples:
 - a) Hot Work
 - b) Tailgate Safety Meeting (TSM) / Job Safety Analysis (JSA)

- c) Confined Space Entry
- d) Excavation Daily Inspection
- e) LOTO

9. Additional Comments/Notes



Contractor Incident Initial Notification Form

(Due within 24-Hours of Incident Occurrence)

Revision Date: 4.19.24

FINAL INVESTIGATION REPORT DUE WITHIN SEVEN (7) DAYS OF INCIDENT OCCURRENCE

Was a vehicle involved?	Third Party/Contractor Incident Classification	Third Party/Contractor Injury Classification
<input type="checkbox"/> Yes <input type="checkbox"/> No		
Vehicle Type		
Date of Incident	Work Start Time	Investigated By
Time of Incident	Day of Week Incident Occurred	Reporter Full Name & Phone Number
Date & Time Alcosan Notified	Injured Party Type	Location of Incident
Contractor or Third Party Company Name	Contractor Phone Number	Alcosan Project Manager/Supervisor
Last Name (Injured Party)	First Name (Injured Party)	Weather Condition (temp, cloudy, clear, rain, etc...)
Was Subcontractor Injured	Subcontractor Company Name	Job Title of Injured Party
Project Name and Number:		
Incident Description (Please describe what happened <i>and</i> preliminary findings)		
Description of Injury (Include Medical Facility Name, if applicable)		
Incident Type (struck by, fall, etc.)	Nature of Injury (cut, contusion, etc.)	Injured Body Part(s) (Specific Side and Part)
Immediate Corrective Actions		
Photos Required		



INCIDENT INVESTIGATION REPORT

- This incident report must be completed for all **non-injury** and **injury incidents**.
- If there are multiple people injured, submit a full report for each person.
- Tabs 1 and 2 require general information and must be filled in for every incident.
- Please review tabs 3-4 to provide additional information, based on the type of incident.
- Tab 5(Corrective Actions) must be completed for each incident.

☐ Final Report

Date of Final Report:

CLASSIFICATIONS

Incident Classification

Injury Classification

Was vehicle involved?

☐ Yes ☐ No

Vehicle Incident Classification

☐ Preventable☐ Non-Preventable☐ Not Applicable

****A Near Miss is an unplanned event that did not result in injury, illness, or damage, but had the potential to do so.****

DATES / TIMES

Date of Incident

Work Start Time

Time of Incident

Day of Week Incident Occurred

Date Company Notified

Date of Preliminary Report

INVESTIGATION

Investigated By

Report Prepared By

Contact Information

EMPLOYEE INFORMATION

Last Name

First Name

Time in Classification When Incident Occurred

Performing Regular Duties When Incident Occurred?

Hours Worked Per Week

Gender

Did Injury Occur on Company Property?

Years Months Weeks

☐ Yes ☐ No☐ Male ☐ Female☐ Yes ☐ No ☐ N/A

CONTRACTOR / THIRD PARTY

Contractor or Third Party Company Name

Phone

Alcosan Project Manager/Supervisor

Last Name

First Name

Address

City

State

Zip

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 refer to Pay Item 23 – Acid Producing Rock Disposal for payment.

Add No. 12

- 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-

ADD NO. 6

- excavation grouting per additional Pay Items.
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. Bedrock excavation.
 - e. 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.
 - f. Concrete from the nearby Primary Panel that is being excavated for a Secondary Panel.
 - g. 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

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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.
 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.

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- 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.

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R. Pay Item 18 – Excavation of “Hard Slag” Removal

- 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

- 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.2~~, 3.06C, and 3.07A.
 2. Payment for this pay item will be for Residual Waste disposal in excess of the

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quantities described in Part 3.1.A.9.b. 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 additional Residual Waste Soil, that is discovered due to quantities in excess of work outside the Lump Sum quantities ~~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 3.1.A.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

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.2, 3.06C, and 3.07A.
2. Payment for this pay item will be for disposal of Acid Producing Rock as a Residual Waste if encountered within the excavations described in Part 3.1.A.10.a. 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.

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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.
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.

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Y. 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.
- Z. Pay Item 26 – Specific Allowance #15 – Temporary Security Trailer
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 providing temporary security trailer and utilities to the trailer.

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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

ATTACHMENT – B

Addendum No. 12 Geotechnical Baseline Report

**ALLEGHENY COUNTY SANITARY AUTHORITY
PITTSBURGH, PENNSYLVANIA
CONTRACT DOCUMENTS**

**VOLUME 4 OF 5
Including
GEOTECHNICAL BASELINE REPORT**

For

**CONTRACT NUMBER 1800 G, E, H, P
WET WEATHER PUMP STATION**

G – General

E – Electrical

H – HVAC

P - Plumbing

SEPTEMBER 2025
(Revised in Addendum No. 12)

DOCUMENTS PREPARED BY:

**JCK Underground, Inc. | A Schnabel
Engineering Company**



Phaidra Campbell

Signer Name: Phaidra Campbell
Signing Reason: I approved
this document.
Signing Time: 2025-09-18
14:16:01(EDT)





ALCOSAN

Contract No. S-489

Wet Weather Pump Station



Geotechnical Baseline Report (GBR)
Revised in Addendum No. 12

Version 3.0

September 2025

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Appendices

Appendix A: Glossary and Abbreviations
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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, walers, 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. Groundwater infiltration will occur along the shaft sidewalls, shaft invert, and tunnel junction chamber. 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, static groundwater at Elev. 710 ft, and recharge from Ohio River.

ADD. NO. 12

ADD. NO. 6

ADD. NO. 12

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.

ADD. NO. 12

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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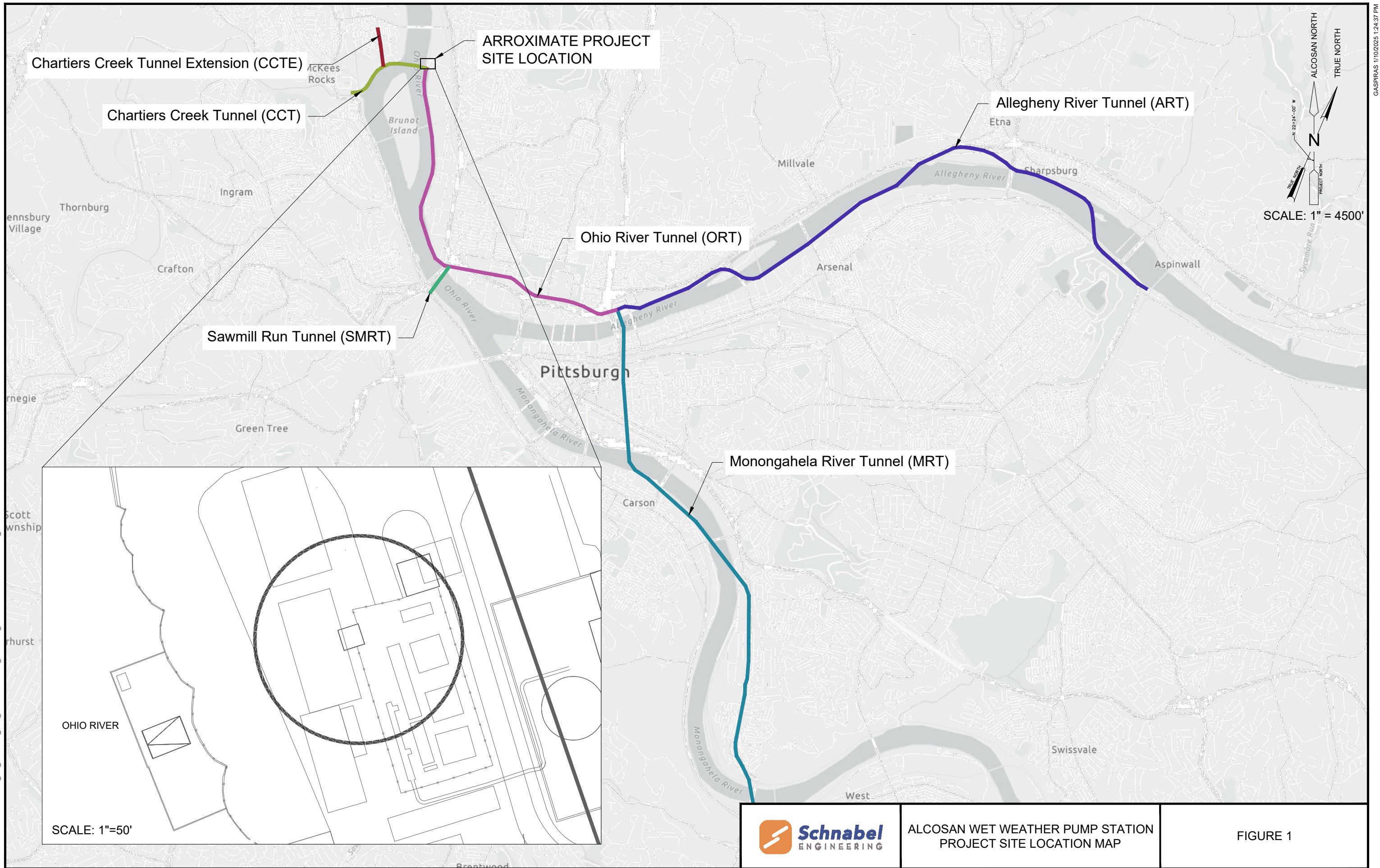
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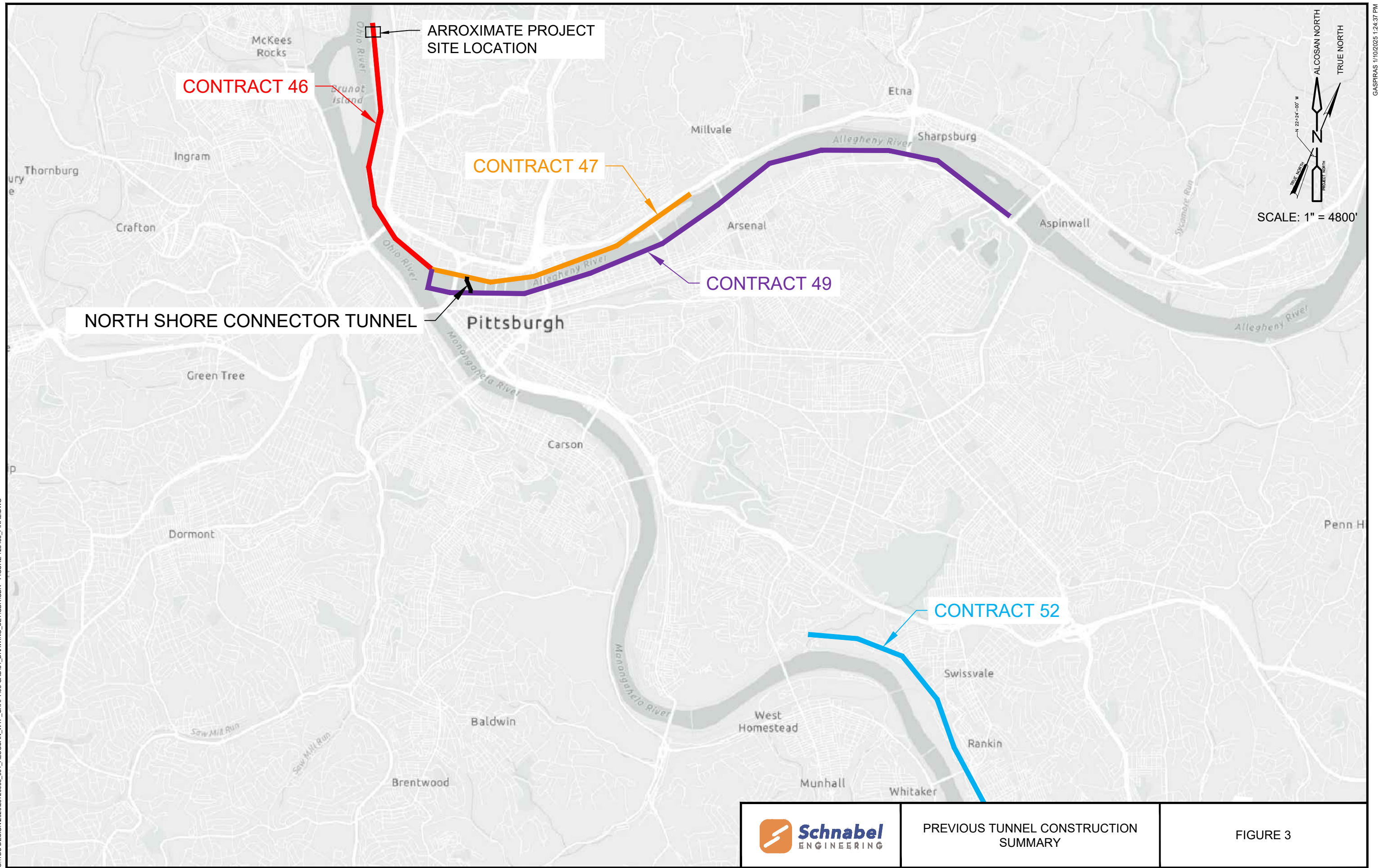
Section 10

Figures

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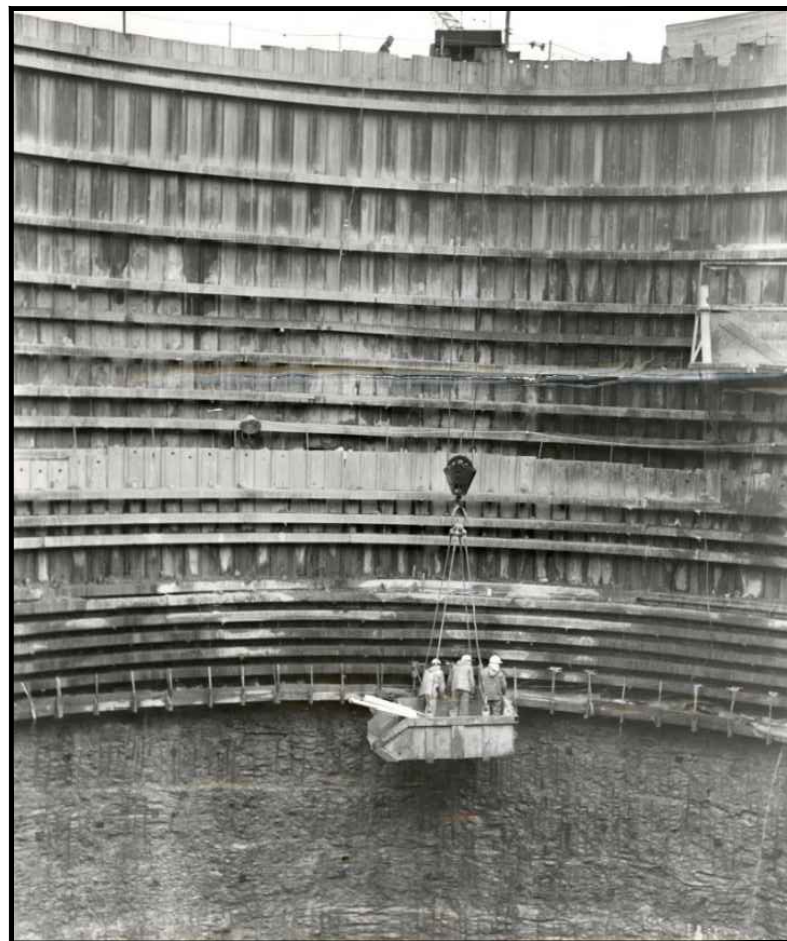
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PREVIOUS TUNNEL CONSTRUCTION SUMMARY

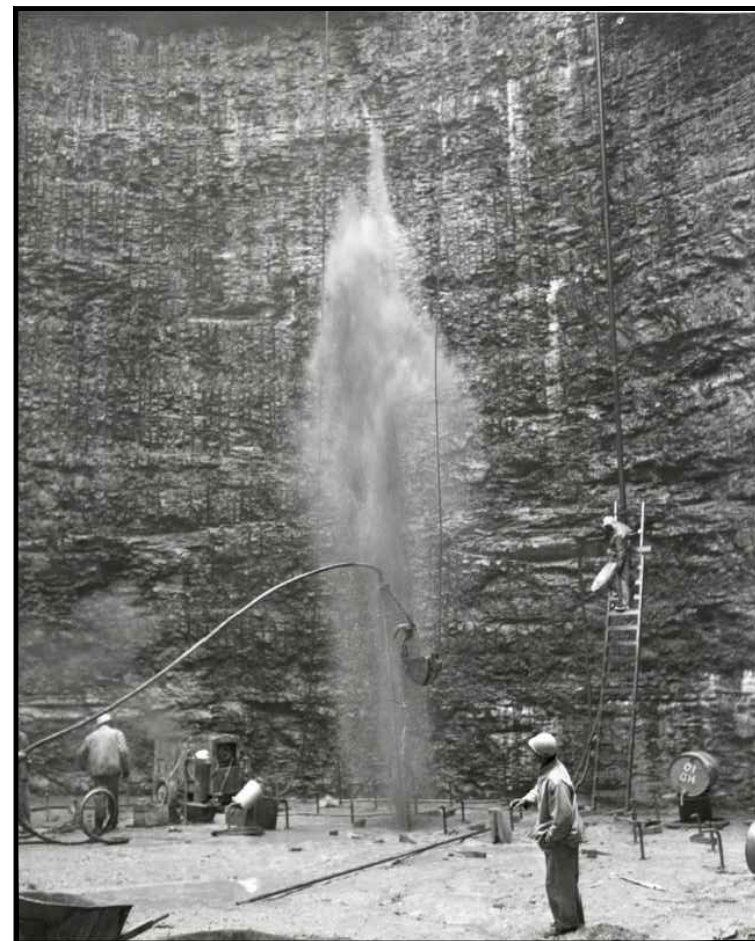
FIGURE 3

PHOTO 1



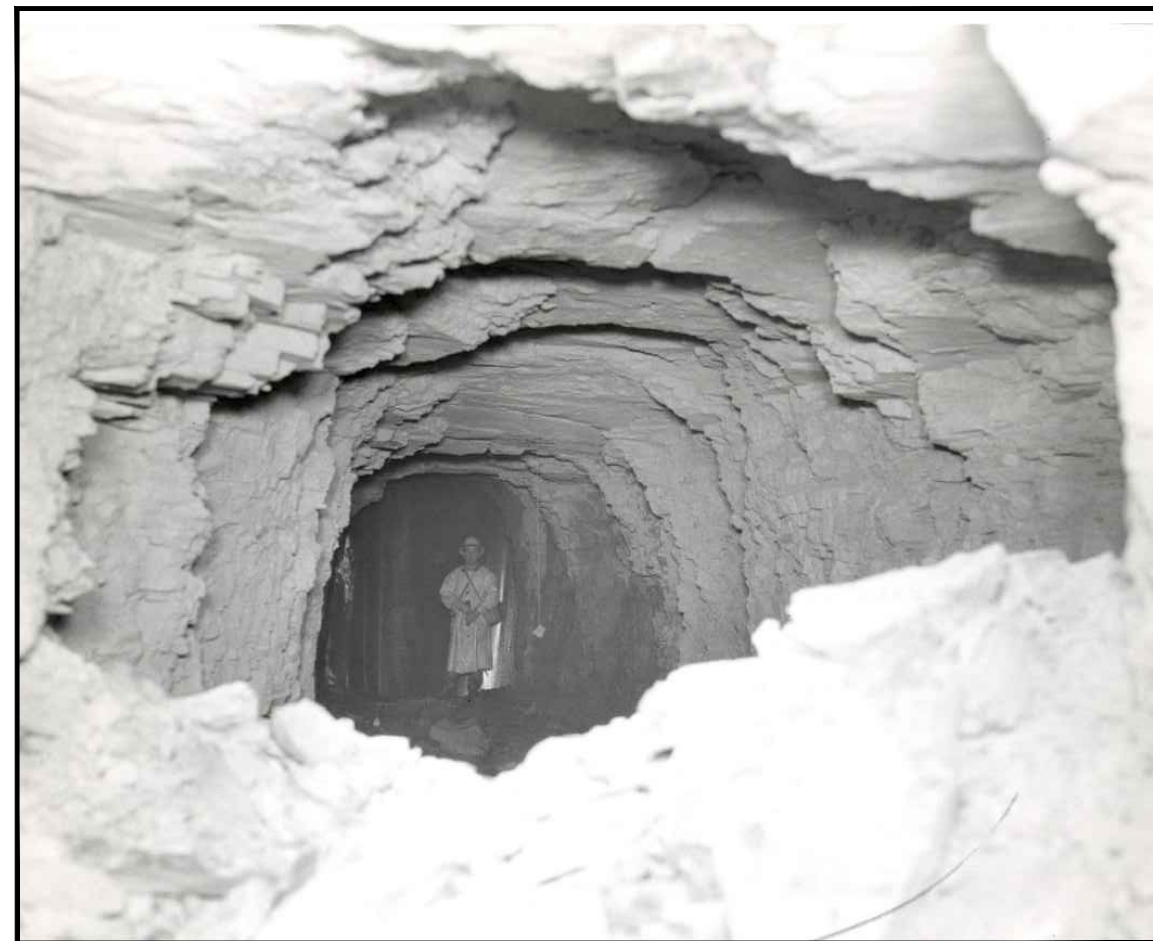
MAIN PUMP STATION WET WELL CONSTRUCTION.
STEEL SHEETING EXCAVATION SUPPORT THROUGH SOIL
AND PATTERN ROCK BOLTS IN ROCK.

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.

O:\TBU DESIGN\2023\2320036_001_ALCOSAN_WTP_SHAFT\08-CAD\04_DRAWING_SET\GBR\GBR - FIGURE 123456_FINAL.DWG

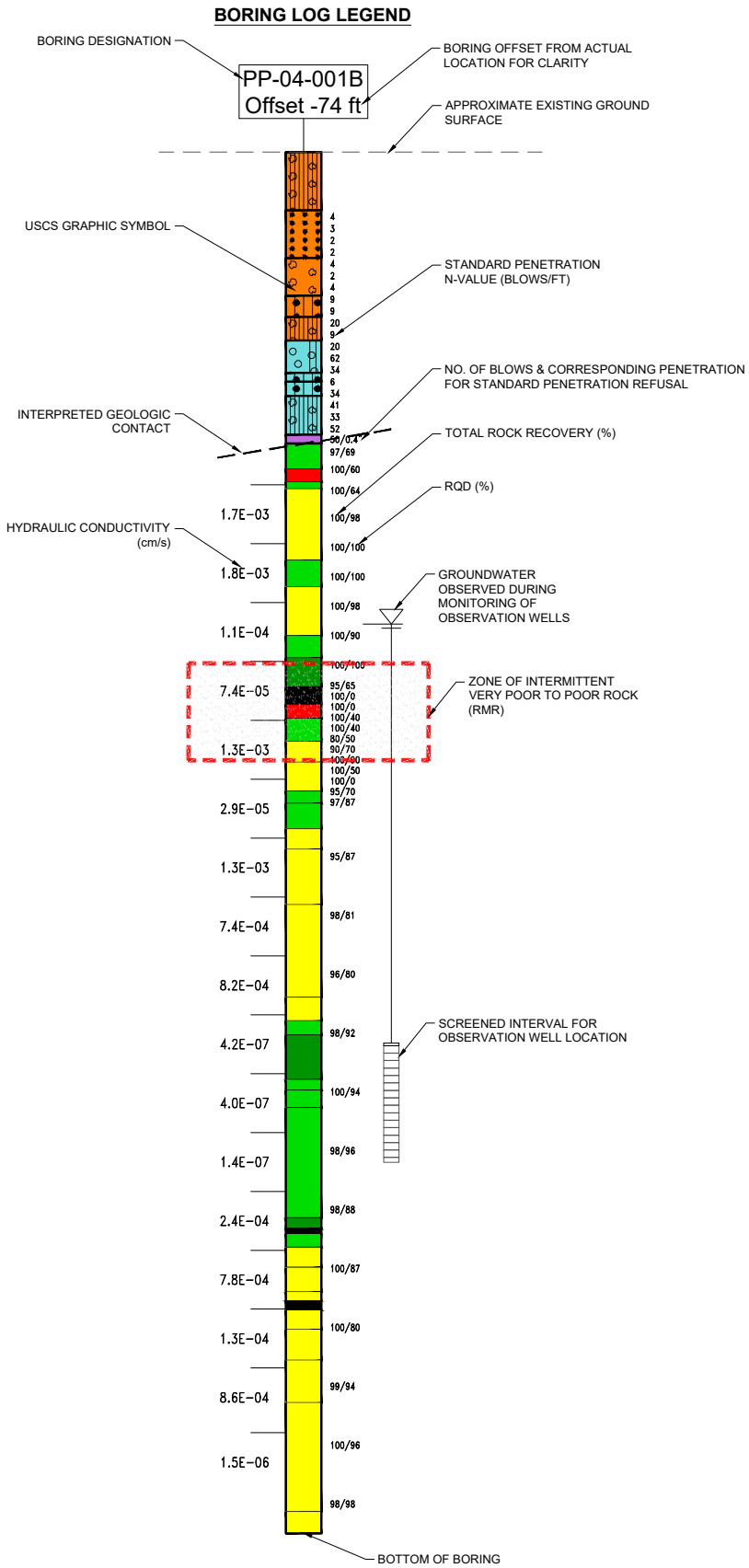
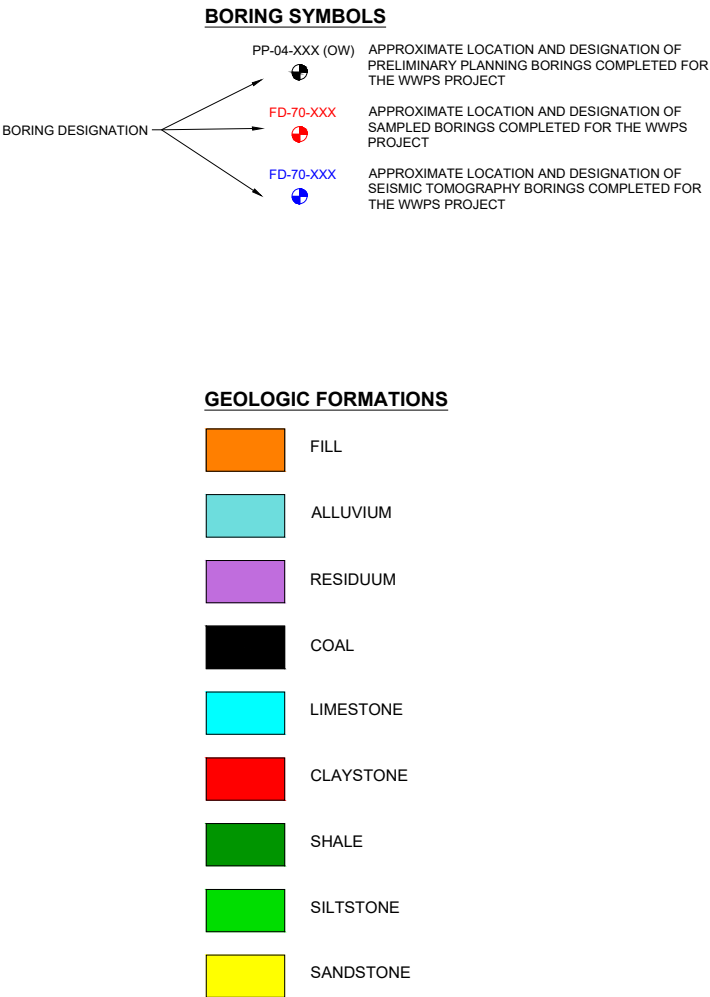
UNIFIED SOIL CLASSIFICATION SYSTEM		
BASED ON ASTM D2488		
MAJOR DIVISIONS	GROUP/GRAPHIC SYMBOL	TYPICAL DESCRIPTION
COARSE- GRAINED SOILS More than 50% retained on No. 200 Sieve	GW	WELL-GRADED GRAVEL
	GP	POORLY GRADED GRAVEL
	GW-GM	WELL-GRADED GRAVEL WITH SILT
	GW-GC	WELL-GRADED GRAVEL WITH CLAY
	GP-GM	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
FINE- GRAINED SOILS 50% or more passes No. 200 Sieve	SC	CLAYEY SAND
	ML	SILT
	CL	LEAN CLAY
	OL	LOW PLASTICITY ORGANIC SOIL
	MH	ELASTIC SILT
	CH	FAT CLAY
	OH	HIGH PLASTICITY ORGANIC SOIL

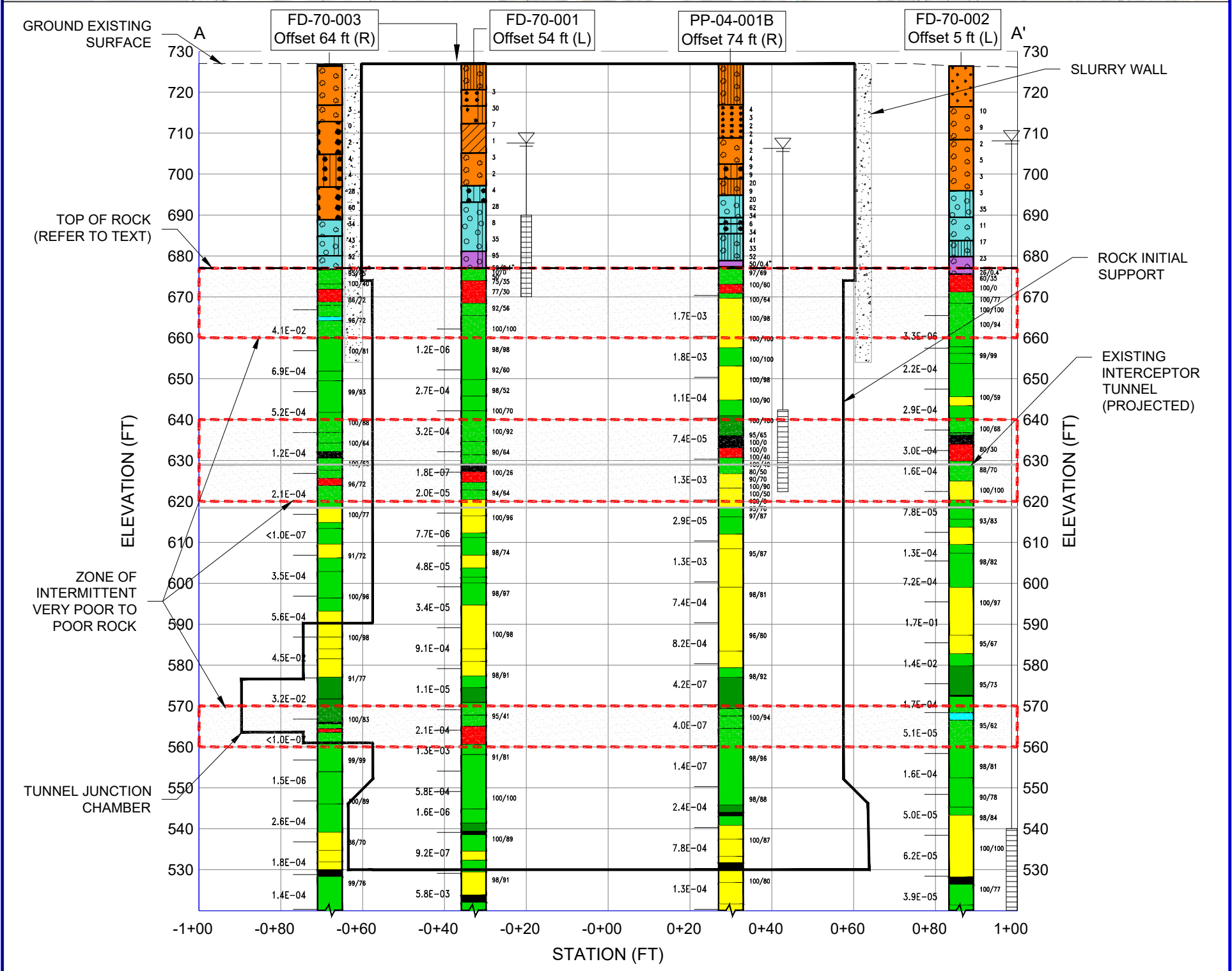
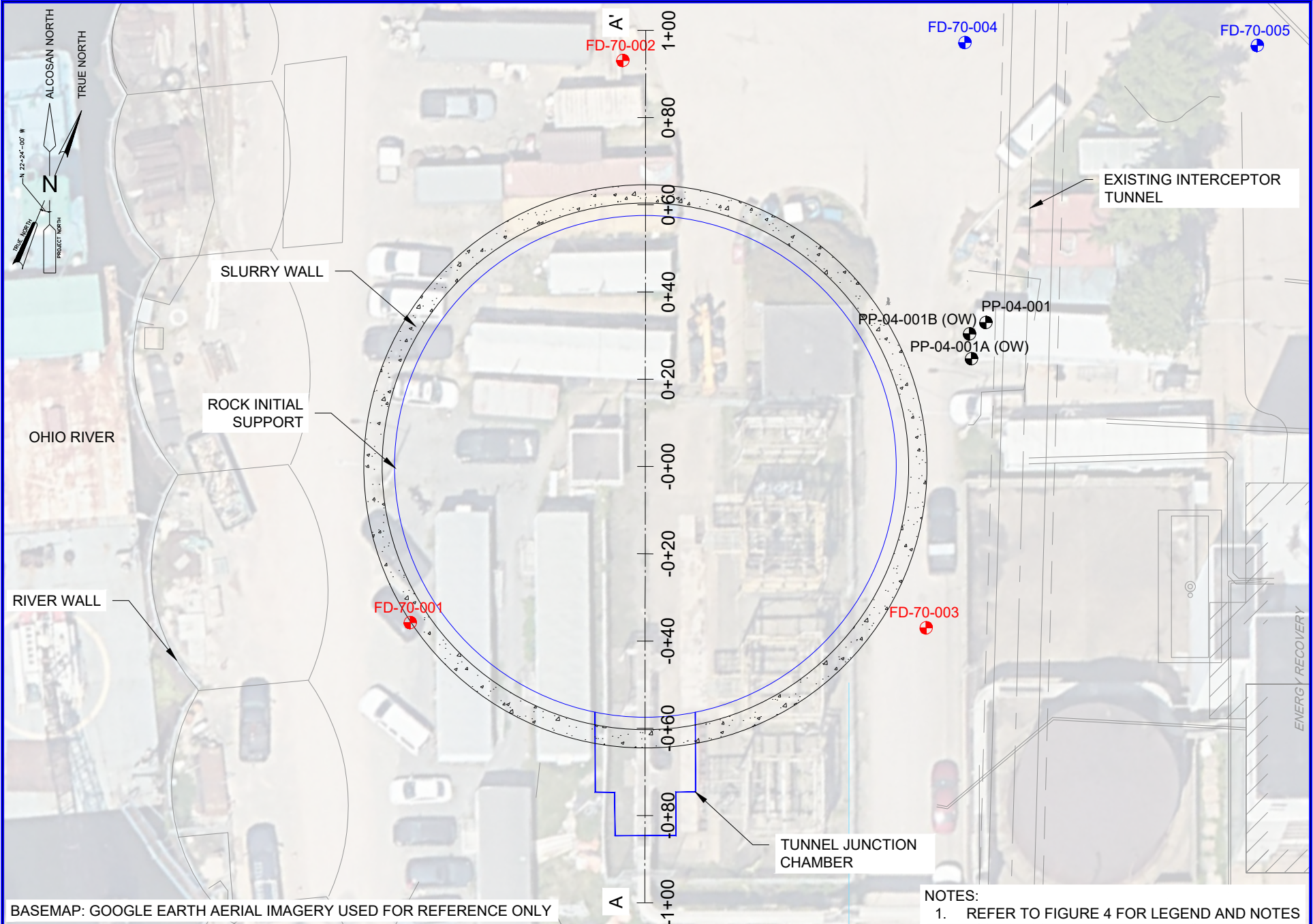
QUALITATIVE DESCRIPTION OF GRANULAR SOIL DENSITY

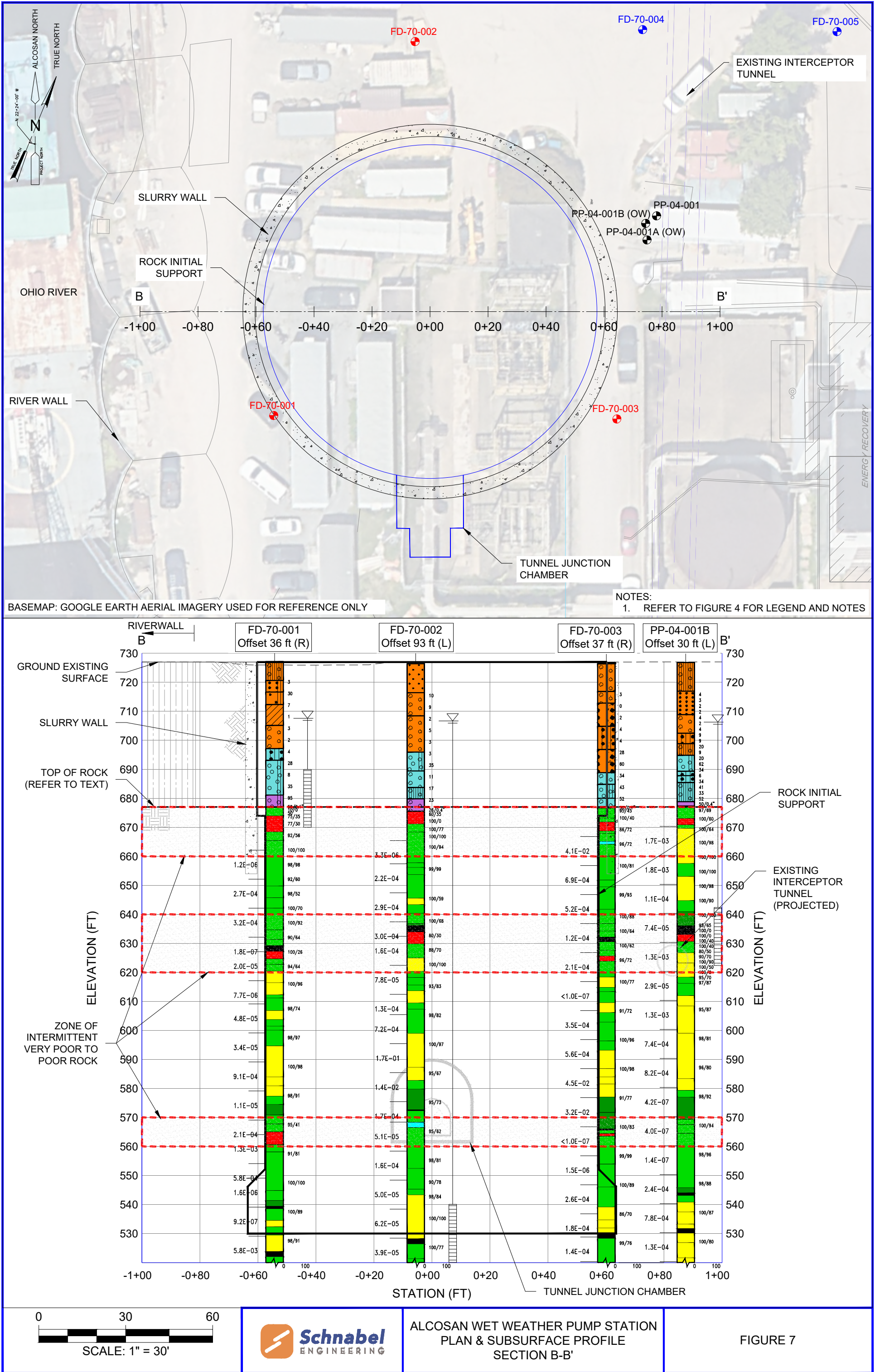
DESCRIPTOR	N-VALUE
VERY LOOSE	0-4
LOOSE	5-9
MEDIUM DENSE	10-30
DENSE	31-50
VERY DENSE	>50

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.







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.

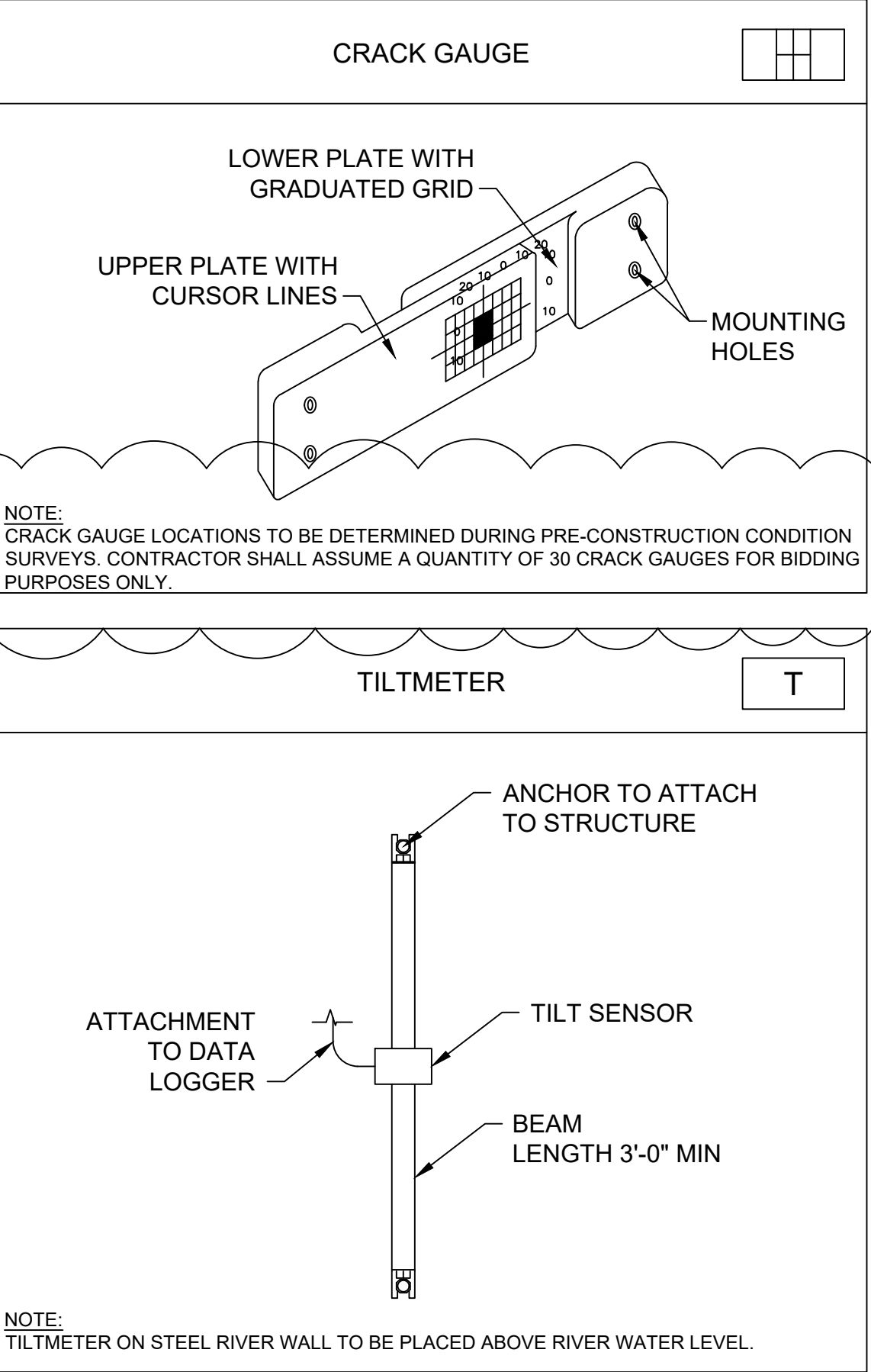
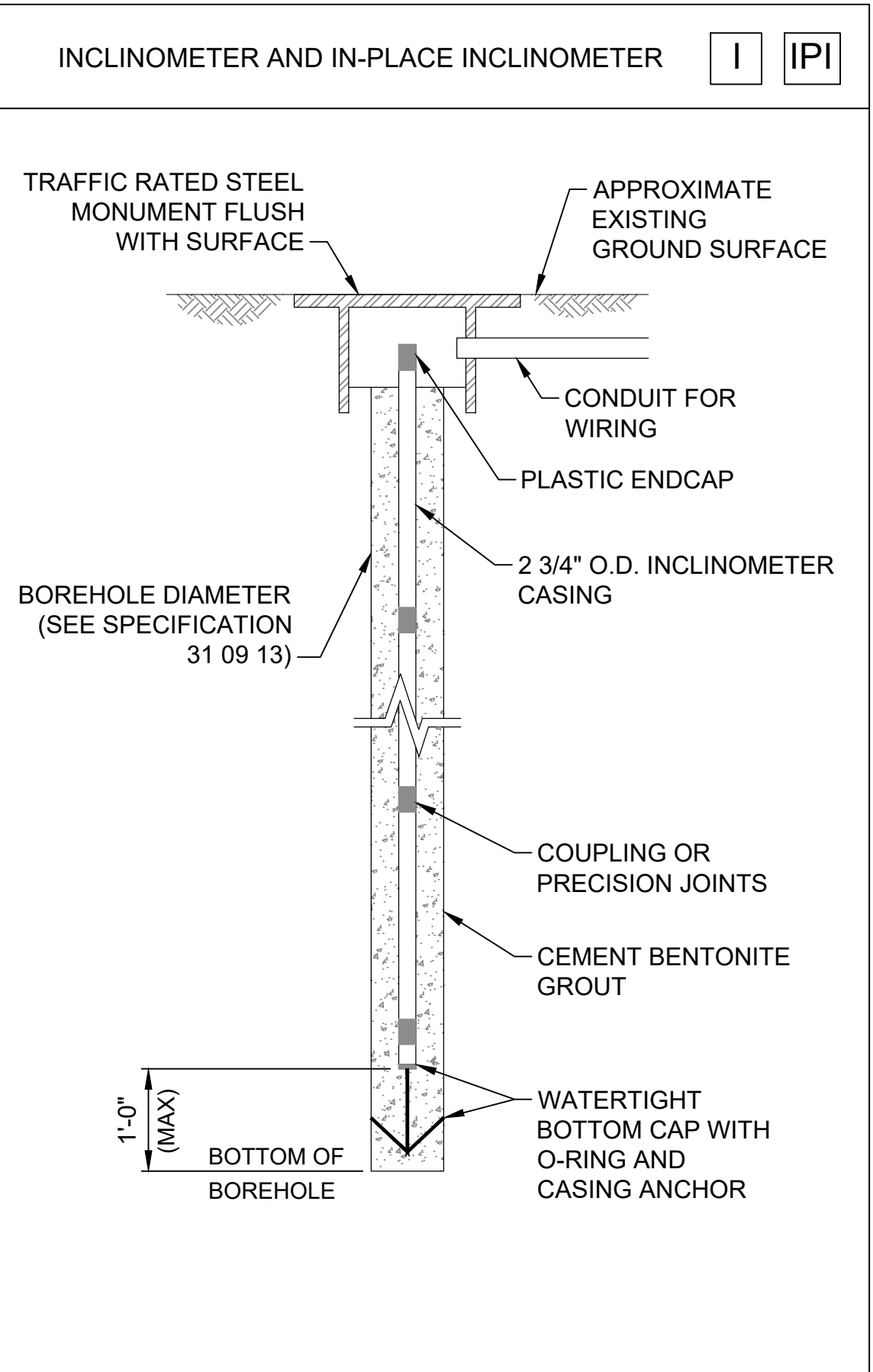
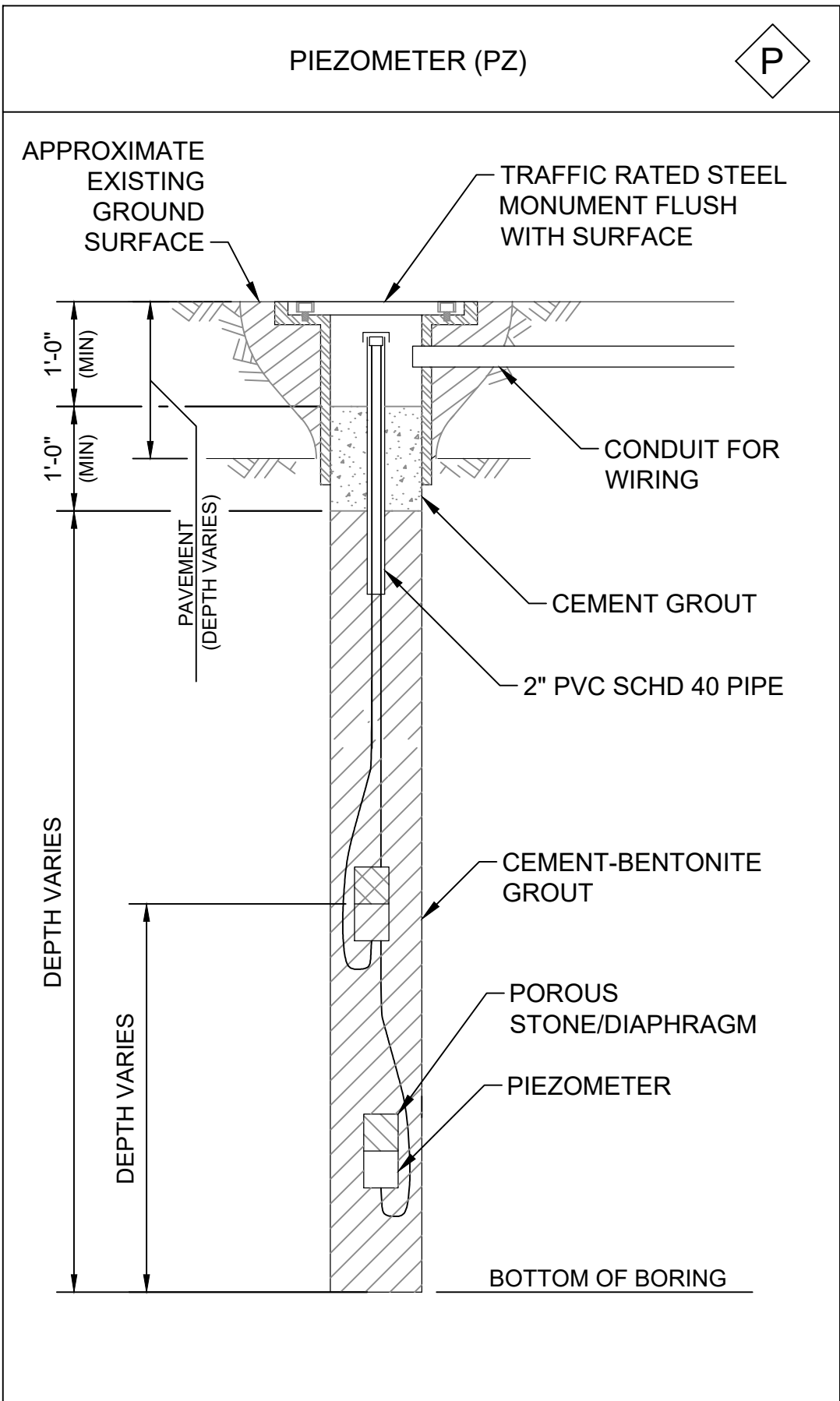
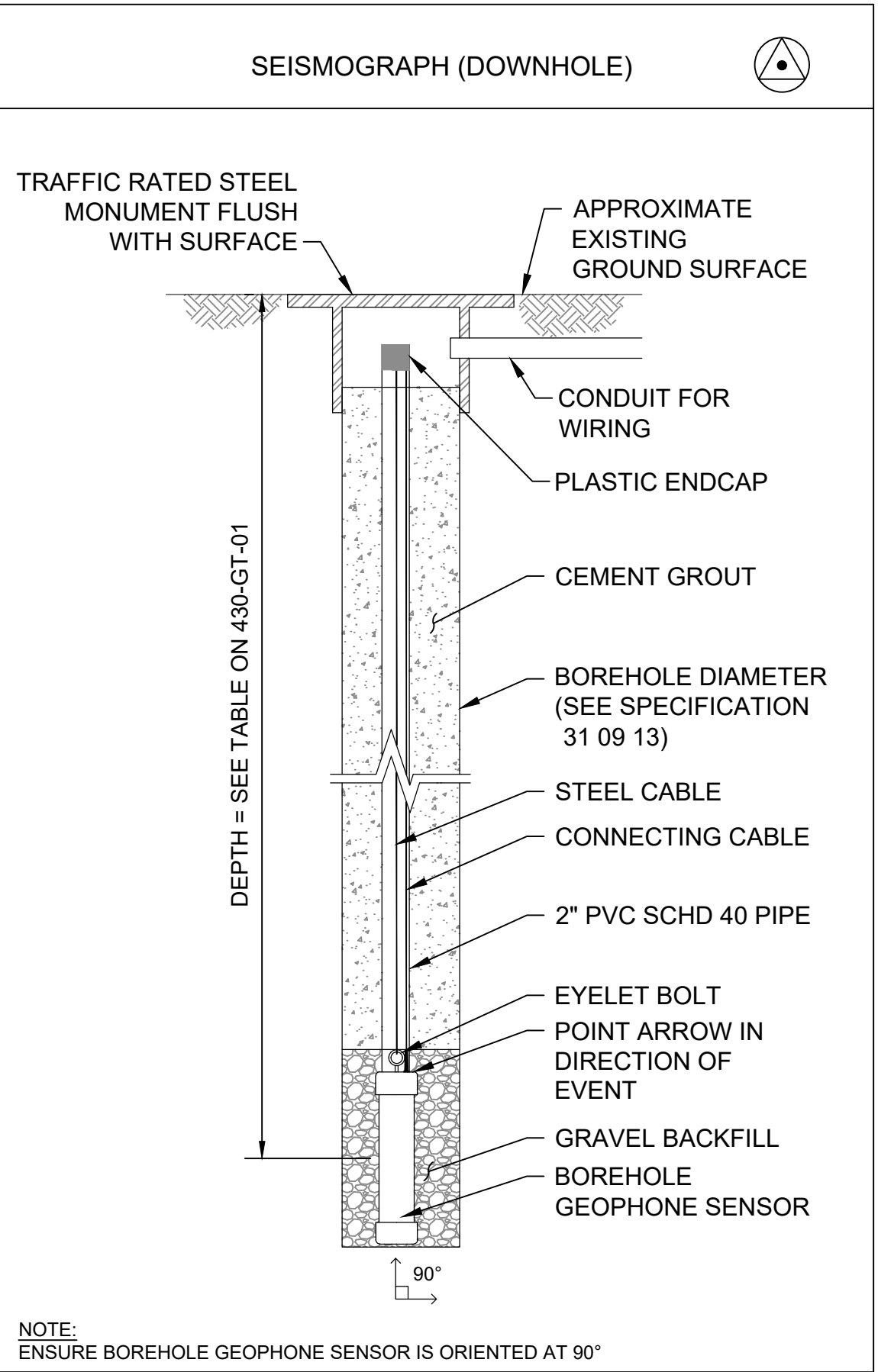
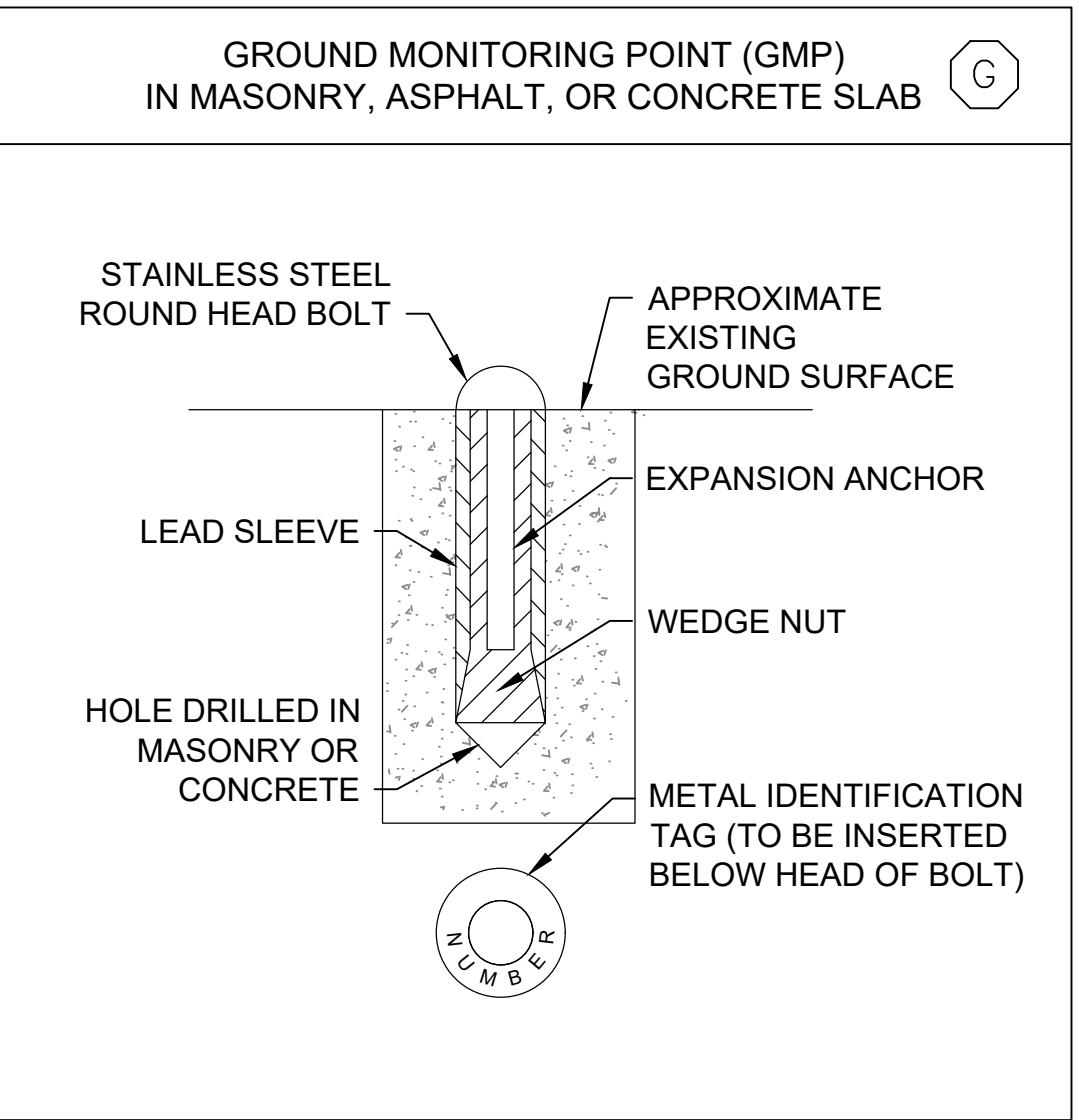
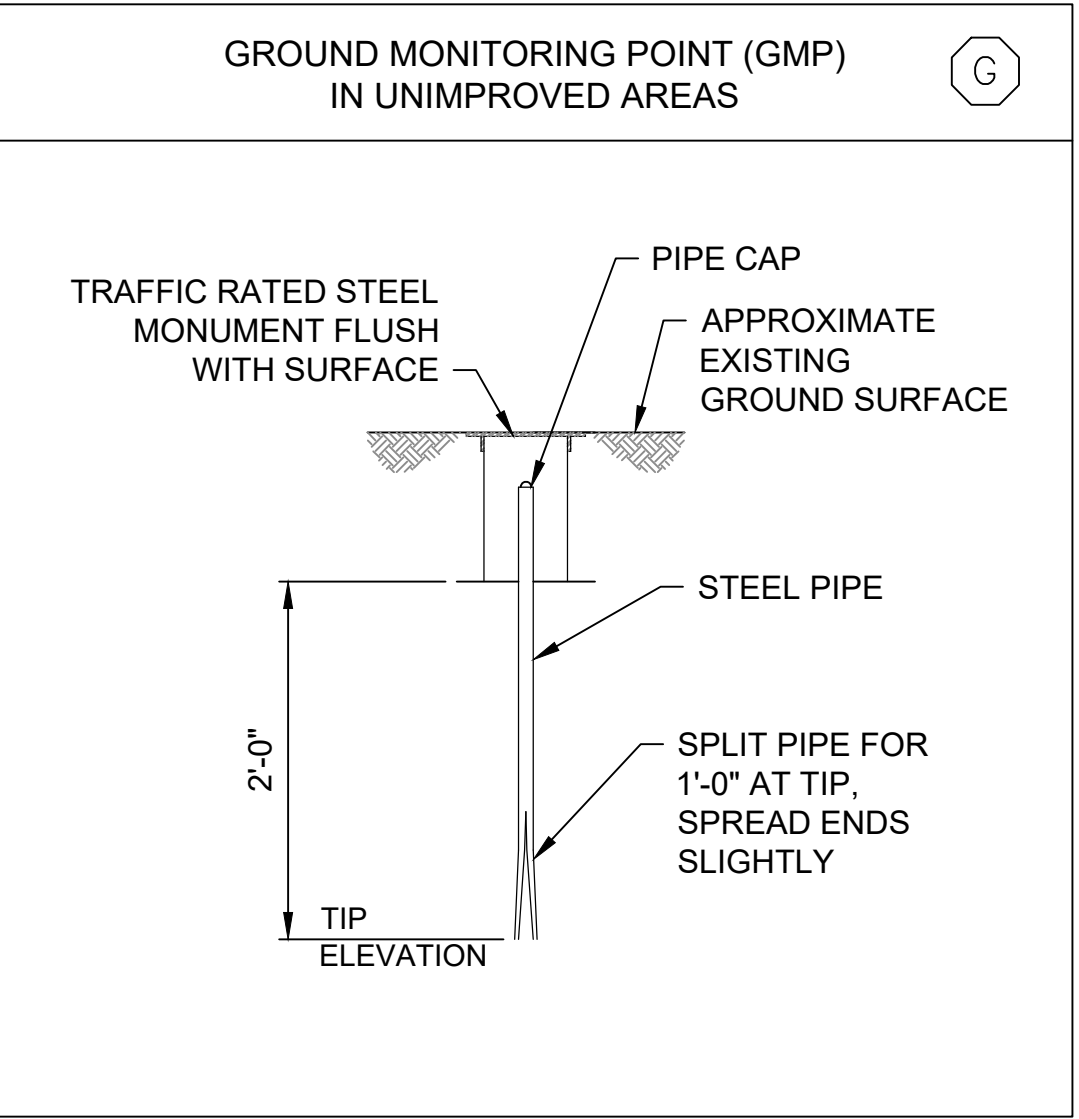
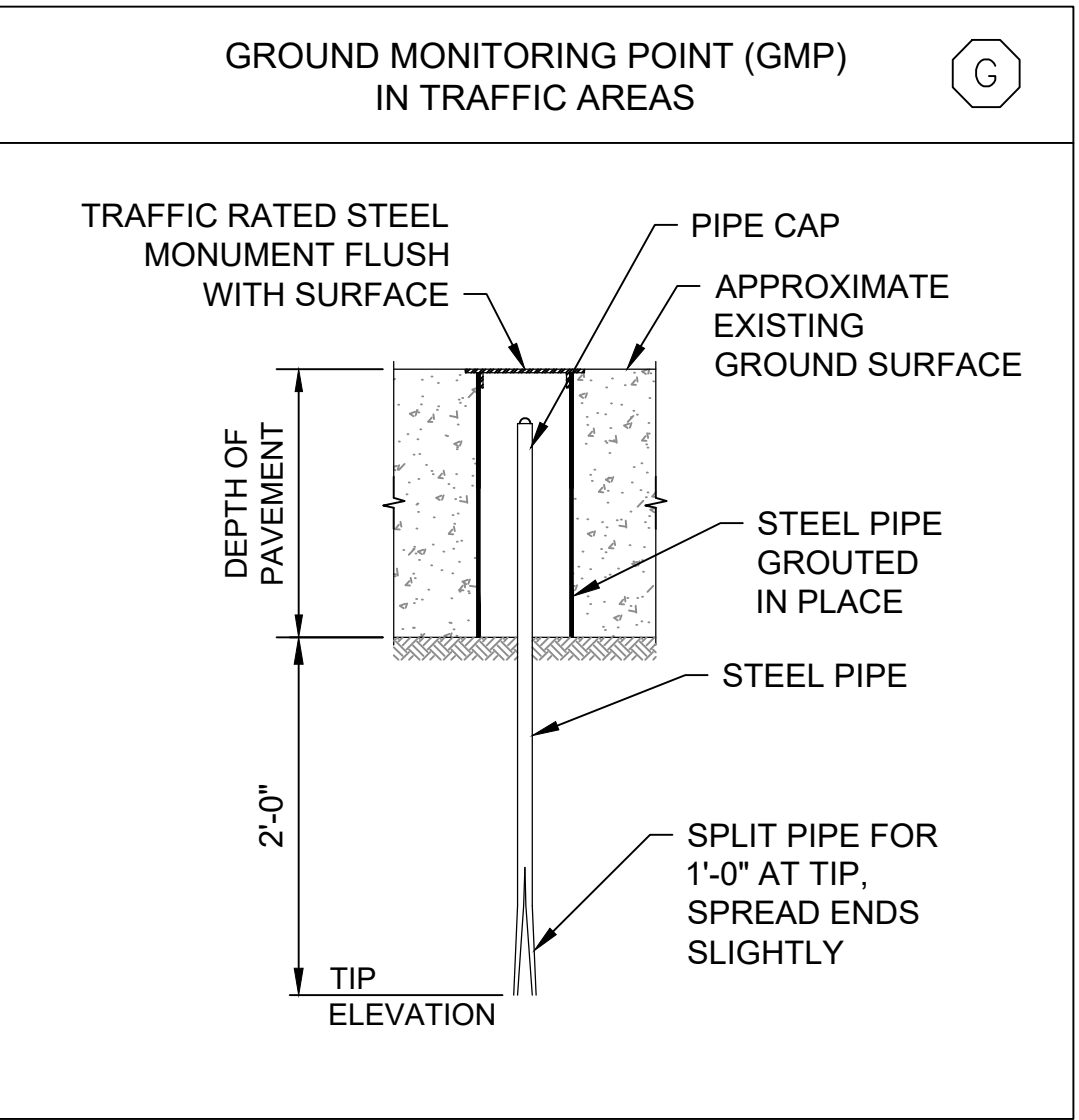
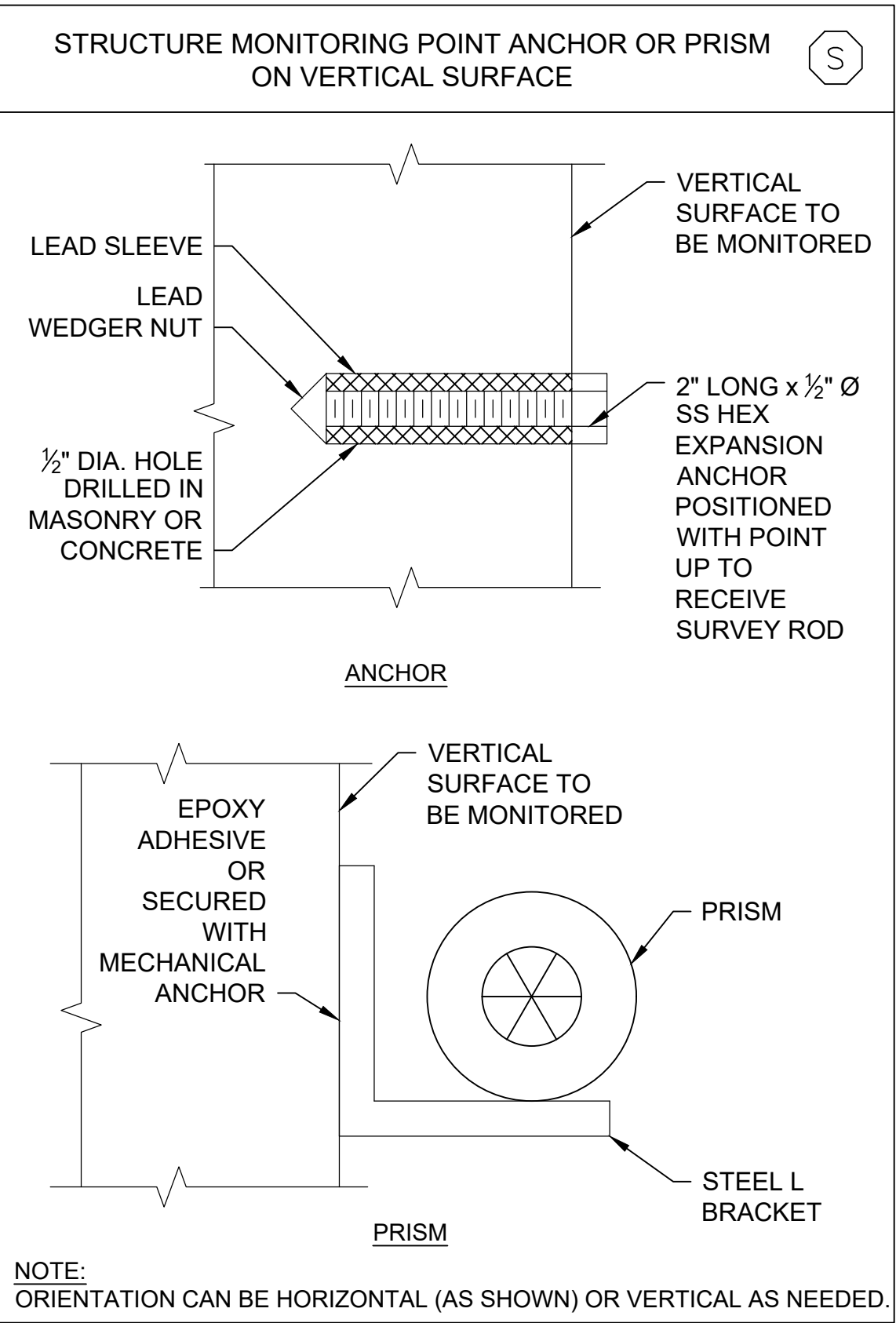
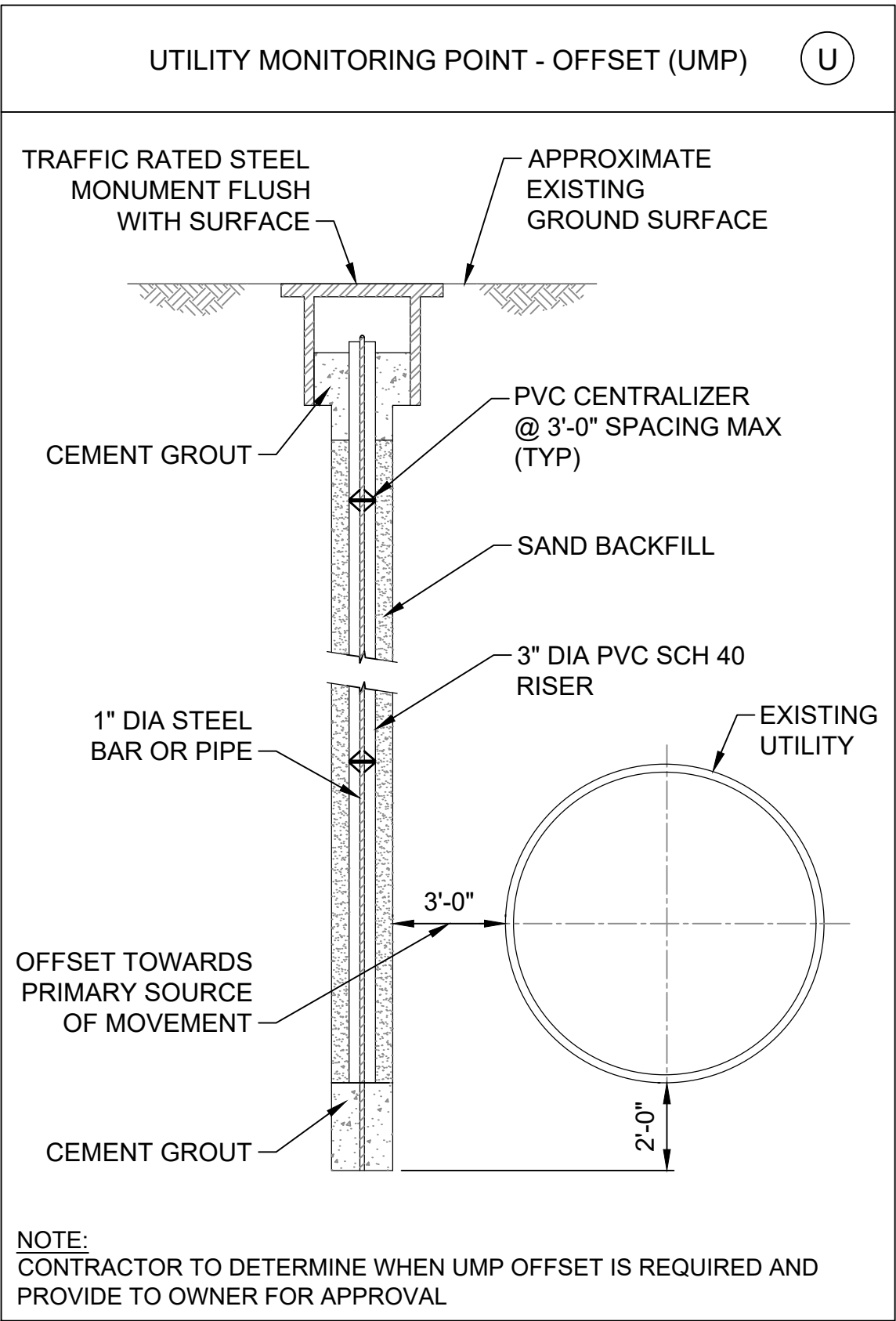
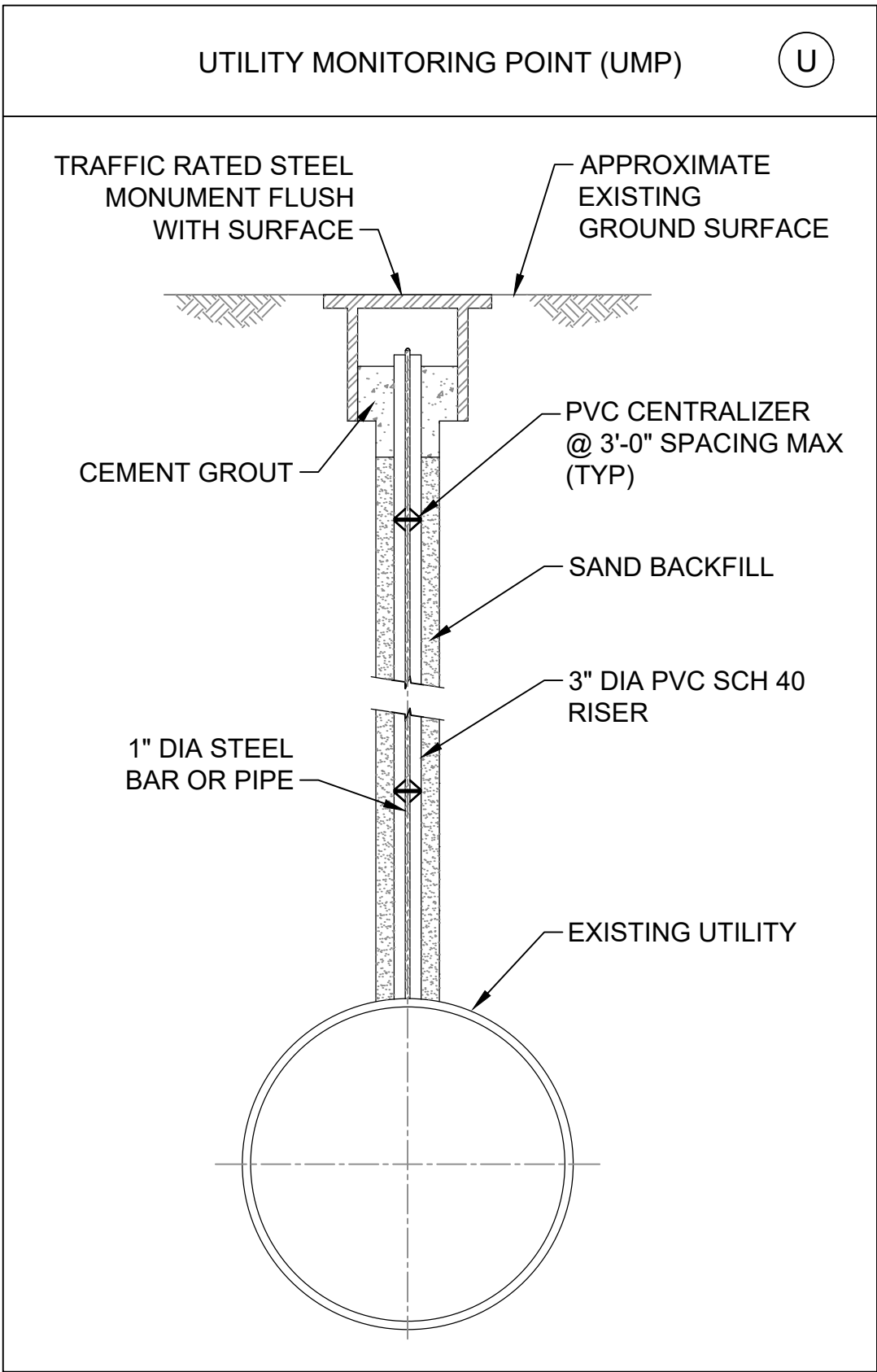
Vein:	A fracture that has been filled with mineral material (e.g., quartz, calcite)
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Appendix A.2 Abbreviations

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. 12 Drawings



Designed by: G. ASPIRAS	REVISION				
	REV No.	DATE	DESCRIPTION	APPV	
	0	5/16/25	ISSUED FOR BID	PDC	
Drawn by: P. CAMPBELL	1	9/18/25	ADD. 12 - UPDATED NOTE ON CRACK GAUGES	PDC	
Checked by: P. CAMPBELL					

Brown AND Caldwell	
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J C K UNDERGROUND A S C Signer Name: Phaidra Campbell Signing Reason: I approved this document. Signing Time: 2025-09-18 15:44:38(EDT)	 PHAIDRA D CAMPBELL REGISTERED PROFESSIONAL ENGINEER NO. 21625 PENNSYLVANIA PE095271	 alcosan allegheny county sanitary authority	ARLETTA SCOTT WILLIAMS EXECUTIVE DIRECTOR, ALCOSAN 3300 PREBLE AVE. PITTSBURGH, PA 15233 (412) 766 - 4810 www.alcosan.org	ALLEGHENY COUNTY SANITARY AUTHORITY WASTEWATER TREATMENT PLANT WET WEATHER PUMP STATION 430-GT-04 GEOTECHNICAL INSTRUMENTATION DETAILS	Contract: S489 CAD File Name: 430-GT-04.dwg Date: 5 / 16 / 2025 Sheet:
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