January 15, 2026

CONTRACT NO. 1797

OHIO RIVER TUNNEL

ADDENDUM No. 12

All Bidders bidding **Contract No. 1797** shall read and take note of this **Addendum.** The Contract Documents for **Contract No. 1797 – Ohio River Tunnel** are hereby revised and/or clarified as stated below.

Acknowledgement of Contract No. 1797

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

Michael Lichte P.E.

Director of Regional Conveyance

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ACKNOWLEDGEMENT OF

CONTRACT NO. 1797 – OHIO RIVER TUNNEL

***** return via email to ORT.bids@alcosan.org *****

ADDENDUM No. 12

FIRM NAME: _____

SIGNATURE: _____

TITLE: _____

DATE: _____

January 15, 2026
CONTRACT NO. 1797
OHIO RIVER TUNNEL
ADDENDUM No. 12

ATTENTION:
BIDS DUE: 11:00 A.M., prevailing time, on **Thursday, February 26, 2026**
DEADLINE FOR QUESTIONS: 5:00 P.M., **Friday, January 16, 2026**

This Addendum consists of 112 total pages including the following attachments:

- Attachment A – APPENDIX E – SUPPLEMENTAL INFORMATION, Section 5.5.5 *Existing Owner Interceptor Exhibits* (8 sheets including Appendix E fly sheet)
- Attachment B - APPENDIX A – TECHNICAL SPECIFICATIONS, Section 01 45 23 (12 pages)
    - *Attachment 3 – List of Structures in the Zone of Inspection Not Listed in Attachments 1 and 2*
- Attachment C – APPENDIX B - CONTRACT DRAWINGS (4 sheets)
    - Revised O27-ST-122 (Sheet 225 of 770)
    - Revised A48-ST-306 (Sheet 367 of 770)
    - Revised A58-ST-424 (Sheet 425 of 770)
    - Revised O06A-ST-806 (Sheet 629 of 770)
- Attachment D – APPENDIX A – TECHNICAL SPECIFICATIONS, Section 03 30 00 (39 pages)
- Attachment E – APPENDIX A – TECHNICAL SPECIFICATIONS, Section 01 31 00 (13 pages)
    - Attachment 11 – *City of Pittsburgh DOMI ROW Permits associated with six near surface sites in Pittsburgh*
- Attachment F – APPENDIX B – CONTRACT DRAWINGS (2 sheets)
    - Revised O14-ST-616 (Sheet 556 of 770)
    - Revised O14-ST-619 (Sheet 559 of 770)

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)

Ohio River Tunnel. 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 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.

CONTRACT NO. 1797
OHIO RIVER TUNNEL
ADDENDUM NO. 12

A. QUESTIONS & ANSWERS FROM RFI'S SENT TO ORT.bids@alcosan.org

Q1 *Please confirm the Norfolk Southern review of Contractor construction documents required under clause 1.5.B.5 in specification section 01 90 00 will be completed concurrently with ALCOSAN's review of the same documents. Further, should Norfolk Southern's review delay the Work, please confirm the Contractor will be granted compensable time extension(s) for said delay.*

A1 **Confirmed. Refer to Addendum 011, RFI Q3/A3.**

Q2 *O14 48" Western Sewer Bypass Location - The sequence of construction for the O14 regulator indicates bypass pumping for the existing 48" RCP "western sewer". Please confirm the existing manholes that will act as the start and end point for the bypass pumping.*

A2 **The Owner has completed previous projects on the existing 42" and the 48" combined sewers that have included bypass pumping at upstream locations previously coordinated with the Owner and other associated property owners. While property owner information is provided, it is the Contractor's obligation to secure appropriate private property permissions, permits and authorization for work on sewers, within the public ROW and near all streams including stream crossings. Referenced locations are included on exhibits: ADDED to APPENDIX E – SUPPLEMENTAL INFORMATION; See Attachment A of this Addendum.**

Q3 *01 35 26/31-71-19 - Tunnel Classification - Section 3.5F of Specification 01 35 26 states: "Gas within groundwater and certain soils, shales, and other rock formations have been known to give off considerable amounts of poisonous and explosive gases as described in the GBR." However, Section 1.8C of the Tunnel Boring Machine Specification requires: "All essential service equipment shall be Class I, Div. 2." We believe this requirement does not fully align with the potential for "considerable amounts of poisonous and explosive gases" noted above.*
Please confirm that Class I, Div. 2 protection is appropriate for all essential service equipment given the described gas conditions. Additionally, there is no bid item allowance for tunnel operation shutdowns due to excessive gas conditions. If tunneling operations are suspended as a result of elevated gas levels, will such delays be considered a Differing Site Condition?

A3 **Class 1, Division 2 Classification is confirmed for all essential service equipment.**

Since this is covered in BID ITEM 33 (refer to Answer A7 of this Addendum); it is not considered as a DSC. For clarification - Section 01 35 26 Part 3.1 F's reference to "…considerable amounts of poisonous and explosive gases as described in the GBR" reflects isolated gas conditions encountered in limited boreholes and certain locations of the previous DTI construction; it is not an indication of continuous hazardous-location classification. The TBM Specification's requirement for Class I, Division 2 equipment is based on the Owner's interpretation that flammable gases are not expected continuously along the entire project alignments but may be encountered only intermittently, which aligns with Class I Division 2 criteria.

Q4 *01 35 26/31-71-19 - Tunnel Classification - Section 3.5F of Specification 01 35 26 states: "Gas within groundwater and certain soils, shales, and other rock formations have been known to give off considerable amounts of poisonous and explosive gases as described in the GBR." However, Section 1.8C of the Tunnel Boring Machine Specification requires: "All essential service equipment shall be Class I, Div. 2." We believe this requirement does not fully align with the potential for "considerable amounts of poisonous and explosive gases" noted above. There is no bid item allowance for tunnel operation shutdowns due to excessive gas conditions. If tunneling operations are suspended as a result of elevated gas levels, will such delays be considered a Differing Site Condition?*

A4 **Refer to this Addendum, Answer A3.**

Q5 *The contract purports to exclude Act 142 protections; this is one-sided and inconsistent with fair cash flow. Please delete the clause in Section 3.35 of the General Conditions stating that Act 142 shall not apply.*

A5 **The first paragraph of Article 3.35 has been deleted. See Section B, Item 1, CHANGES TO CONTRACT DOCUMENTS.**

Q6 *The contract appears silent on Owner's duty to furnish/maintain site access and even reserves a right to exclude Contractor from AS1 after Interim Milestone #1. Please add language obligating Owner to provide/maintain all access, easements, haul routes, lay-down/staging, and real-property rights necessary for the uninterrupted performance of the Work, with price/time relief if access is delayed, restricted, or withdrawn.*

A6 **The Owner will furnish site access within the Limits of Disturbance (LOD) / Limits of Construction (LOC) boundary shown on the Contract Drawings. Contractor shall provide for any additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.**
Regarding Interim Milestone #1 – "Demobilize AS1 Site", the objective is to provide unobstructed access to the future Allegheny River Tunnel Contractor. Thus, access for laydown, staging and use at the AS1 Site within LOC/LOD will no longer be available to the ORT Contractor after this milestone.
ADD ITEM FOR CONTRACTOR'S ACCESS TO WORK - See Section B, Item 2, CHANGES TO CONTRACT DOCUMENTS.

Q7 *Standby Due to Gas - Bid Item 33 is used to compensate the Contractor in the event that Tunnel/Adit or Shaft Construction is interrupted due to encountered gas. Unless the intent is to compensate the contractor for shutting the entire project down for the gas encountered, it is suggested that the Owner creates individual Bid Items for the TBM Tunnel, Adits and Shaft work as these scopes have varying daily costs.*

A7 **Specification 01 22 00 – Measurement and Payment, Bid Item 33 has been REVISED to separate TBM Tunnels, Non-TBM Tunnels/Adits and Shafts; see Section B, Item 3 for CHANGES TO THE CONTRACT DOCUMENTS.**
A revised Bid Form will be issued in the next Addendum.

Q8 *All insurance shall be on an occurrence basis - Sec-on 3 Insurance, Sec-on 3.9 Insurance – Exhibit A – 3SC Paragraph 3 states that all insurance shall be on an occurrence basis. This is not commercially available in the insurance marketplace due to certain coverage lines being written on a claim made form. Specifically, Professional Liability cannot be purchased on an occurrence form. Can the agency please confirm that it will be acceptable to use claim made forms for those policies where this is the commercial standard.*

A8 **Professional Liability Insurance may be provided under a claims-made policy, provided that the policy includes a five-year extended reporting period (tail) commencing upon Final Completion. See Section B, Item 4, CHANGES TO CONTRACT DOCUMENTS.**

Q9 *Specification 01 45 23 requires the cleaning and inspection of utilities shown in Attachment 2 of that section. Using Table 2 and the Utility Inspection Limit Maps provided in Addendum 4, it is clear that most, if not all, of the cleaning and inspection limits fall far outside of the Limits of Construction and Limits of Disturbance. If bypasses are required to meet the inspection flow limits, has the Owner obtained easements and/or permits that would allow for the installation of these bypasses outside the Limits of Construction/Disturbance? Being one of the very first activities required at each site, significant delays could occur if these easements/permits are not in place.*

A9 **The majority of existing sewers and access to existing sewers are within public right of ways (ROWs), located within existing easements (owned by the Owner, Pittsburgh Water, or McKees Rocks), or located within easements obtained by the Owner. Contractors are required to obtain necessary permits for work in the public ROW. For access to the existing private sewers identified adjacent to the O27 site, Contractor to coordinate with Parcel 75-R-270 property owner, Engineered Polymer, for access to their private MH 075P001 and MH 075P002. Note that MH 075P003 along this same private sewer line within Parcel 75-R-270 is located within the O27 Temporary Construction Easement acquired by the Owner.**

Q10 *Pre / Post Inspection Surveys - "Blast Zone of Influence" Property Records - In accordance with Specification Sections 01 45 23, paragraph 3.2.A.4 & 31 71 16, paragraph 1.2.G, any structure within 300ft of a drop shaft OR any structure within 200ft of the centerline of a drill and shoot tunnel excavation will be considered inside the "Blast Zone of Influence." Similar to the Historic Structures listed in Attachment 1 (Specification 01 45 23) that fall within the area of potential effect, please provide Contractors with a list of all properties inside any "Zone of Inspection / Blast Zone of Influence" including the property owner's contact information.*

A10 **Information requested is included in Specification 01 45 23, Attachments 1, 2 and ADDED Attachment 3.**
REVISE Specification 01 45 23, Part 3.2 as indicated in Section B, Item 5.a for Specification 01 45 23 CHANGES TO CONTRACT DOCUMENTS.
ADD Attachment 3 to Specification 01 45 23. See Section B, Item 5.b and Attachment B of this Addendum for ADDED Attachment 3 of Specification 01 45 23 for CHANGES TO CONTRACT DOCUMENTS.

Q11 *Section 2.29 List of Major Subcontractors/Suppliers states, "Failure to provide this information at the time specified will, at the Owner's election, make the Bid nonresponsive or constitute a breach of the awarded Contract." Can you please clarify when the List of Major Subcontractors/Suppliers will be required to be submitted?*

A11 **The list of proposed subcontractors is not required to be submitted with the bid. Per Article 1, Item 7.1 Subcontractors, "*Bidder agrees to submit within FIVE (5) days of Owner's request, a listing of subcontracting firms or businesses that will be awarded subcontracts for portions of Work as described in the Instructions to Bidders.*"**

Q12 *Please advise if Joint Ventures can sign proposal forms, that show only one signature, per the signing authority of their joint venture agreement.*

A12 **Each Joint Venture partner shall be required to sign. A revised Bid Form will be issued in the next Addendum.**

Q13 *Drawing O06A-ST-806 Key Notes 10 calls for CIPP lining. Other drawings call for 20 ft of shotcrete. Is this drawing requiring glass fiber reinforced, flexible polyester felt or fiberglass fiber tube impregnated with corrosion resistant polyester thermosetting resin on top of shotcrete. If so, what is the total length of CIPP required?*

A13 **CIPP has been revised to shotcrete (or gunite). Note that full description of shotcrete application, including thickness and extent (across the entire connection zone) in all existing sewers are given in the respective SOE series of drawings per site.**
See Section B, Item 6 and Attachment C of this Addendum for CHANGES TO CONTRACT DOCUMENTS including Contract Drawings O27-ST-122, A48-ST-306, A58-ST-424, and O06A-ST-806.

Q14 *GBR Section 7.9.4 states that baselines are provided for SINTEF rock drillability and Miller numbers but the referenced Figures 8 and 9 provide no baselines for these parameters. Please provide clarification regarding baselines for these parameters.*

A14 **GBR Section 7.9.4 has been REVISED to delete references to baselines for these two parameters. Refer to the GDR for limited test results, but no baselines are set for these two parameters. See Section B, Item 7 for CHANGES TO CONTRACT DOCUMENTS.**

Q15 *GBR Section 7.11 baselines a horizontal to vertical stress ratio of 2:1. Please clarify whether this in situ stress ratio has been known to cause constructability problems on the previous projects in the area.*

A15 **The DTI project, constructed using drill and blast method as discussed in GBR Section 5.1, experienced roof instability in certain reaches that required steel set supports. These conditions may have been caused by relatively high horizontal stresses.**

Q16 *GBR Section 8.3.1 ambiguously describes the risk that TBM tools will be damaged as they "…strike stronger rock ledges…" Please provide quantitative clarification on the numbers of and/or specific locations where these "stronger rock ledges" are to be encountered for planning of tool wear and numbers of interventions.*

A16 **The effects of various lithologies and their near-horizontal contacts on TBM cutter tools are described in a general manner in the GBR to inform their effects of cutterhead behavior during tunneling. It is not the intent of the GBR to establish "*quantitative clarification on the numbers of and/or specific locations where these stronger rock ledges are to be encountered*" in such multiple interbedded rock formations. Table 8.2 provides percentages of Class 1 through Class 7 across the entire project and Table 7.3 provides percentages of the interbedded rocks in Class 7. It is up to the Bidders to consider using cutter tools arranged with spiral (or double spiral) versus spoke patterns, or hybrid, to address such interbedded rock formations.**

Q17 *O14 Existing Regulator Repairs - Contractors are expected to perform work inside the existing regulator at the O14 site to remove tipping gates and form/pour new walls. Drawing O14-ST-616 indicates stop logs could be in ALCOSAN's possession that the Contractor could utilize to prevent the river flows from coming back into the existing regulator. Please confirm if there are stop logs available to Contractors to facilitate this work.*

A17 **Yes, it is confirmed that there are stop logs available to Contractors to facilitate this work. Contractor must coordinate with ALCOSAN for picking up stop logs from ALCOSAN and returning the stop logs to ALCOSAN. Contractor must only use stop logs during dry weather.**

Q18 *O14 Existing Regulator Repairs - Note 6 on sheet O14-ST-616 indicates that "the contractor shall conduct a field inspection of the existing flap gates inside the existing O14 regulator and any required leakage repair to prevent potential river water from entering the excavation area through the regulator." Due to the lack of details provided for the flap gate and other existing regulator work, should Contractors expect to have to perform this work in the wet with divers, or in the dry?*

A18 **No. No divers are expected to perform this work within the existing regulator. Refer to Addendum 009, Q5/A5. Refer to this Addendum, Answer A17.**

Q19 *Specification Section 03 30 00 Cast-In-Place Concrete - Shrinkage Requirements - Please confirm which concrete mix designs on this project are required to meet shrinkage-control performance criteria, including any prescribed shrinkage limits, test methods, or admixture requirements. If applicable, please reference any relevant sections of the project specifications, as well as PennDOT Pub 408 Section 704 (Cement Concrete), which governs material and performance requirements for concrete mixes.*

A19 **The shrinkage requirements apply to all concrete mixes A through E. See revised Section 03 30 00 for relevant information including shrinkage limits, test methods and admixture requirements. Also refer to Answers to Addendum 008, Q34/A34 for additional information.**
No sections are referenced for this particular item from PennDOT Pub 408 Section 707 as quoted in the RFI. See Section B, Item 8 and Attachment D for CHANGES TO THE CONTRACT DOCUMENTS.

Q20 *Specification Section 03 30 00 Cast-In-Place Concrete - Fiber Requirements - Please clarify whether the project specification requires the use of microfibers, macrofibers, or both for the concrete placements on this project. If fibers are required, please confirm the following:*
- The type (micro or macro),
- The minimum dosage or performance level (e.g., residual strength), and
- Any applicable testing or approval criteria.
Relevant specification references include PennDOT Pub 408 Section 704.1(c) for fiber-reinforced concrete, and any project-specific structural notes regarding reinforcement or crack-control requirements.

A20 **No microfibers will be permitted as replacement for steel reinforcement. Where macrofibers can be used as alternatives to prescribed reinforcement shown on Contract Drawings, the Contractor shall provide equivalent design and submit materials, dosages, design mixes, testing results, and calculations for Owner's review and approval. See revised Section 03 30 00 for relevant information.**
No sections are referenced for this particular item from PennDOT Pub 408 Section 704.1(c) as quoted in the RFI. See Section B, Item 8 and Attachment D for CHANGES TO THE CONTRACT DOCUMENTS.

Q21 *Specification Section 03 30 00 Cast-In-Place Concrete - Coarse Aggregate Fines (Passing No. 200 Sieve) - Local limestone and gravel sources typically yield 1.0–1.5% passing the No. 200 sieve. However, PennDOT Pub 408 Section 703.2(c) – Table D specifies a maximum of 1.0% passing the No. 200 sieve for coarse aggregate used in cement concrete.*
Please confirm whether the project will strictly enforce the 1.0% maximum, or if aggregate with up to 1.5% passing No. 200 is acceptable based on local material availability.
If material outside the 1.0% limit is acceptable, please confirm whether any additional testing, qualification, or approval is required.

A21 **In accordance with ASTM D1140, coarse aggregate passing the 75µm (No. 200) sieve shall be permitted in excess of 1% but not greater than 1.5% provided the material does not contain clay or shale. Material composition as determined by X-Ray Diffraction or similar shall be included in sieve analysis submittal.**
See revised Section 03 30 00 for relevant information.
See Section B, Item 8 and Attachment D for CHANGES TO THE CONTRACT DOCUMENTS.

Q22 *IPP Riverwall Layout Adjustments - Note 5 on Sheet O27-ST-100 states that the Contractor is to adjust the IPP Riverwall layout to accommodate actual field conditions if it is determined that field findings prevent the wall from meeting the minimum requirements shown on the Contract Drawings. Please confirm that the Contractor will be entitled to additional compensation and contract time for any IPP Riverwall changes due to actual field conditions.*

A22 **Bid the River Wall construction as shown on the Contract Documents, including all contract design elements and elements to be designed by the Contractor as specified in the Contract Documents. For additional construction efforts caused by unexpected field conditions, the Contractor may submit change requests per Contract, Article 3, Section 3.32 PROPOSED CHANGE ORDERS, CHANGE ORDERS, AND CHANGE DIRECTIVES and Section 3.34 DELAYS AND EXTENSION OF TIME.**

Q23 *IPP Riverwall Access - Note 8 on Sheet O27-ST-100 states that the Contractor is responsible for obtaining all required permit and regulatory approvals for the method of site access adopted. For IPP River-Based Operations please outline and provide copies off all permits/regulatory approvals that the Owner has already obtained and outline permits/regulatory approvals that the Contractor is to obtain.*

A23 **IPP River-Based Operations are a Contractor's option. The Owner has not obtained any relevant permits/regulatory approvals for river-based access. It is the Contractor's full responsibility for identifying and acquiring the required permits/regulatory approvals for river-based access.**

Q24 *Pier Foundation of Norfolk Southern Railway - The contract drawing ORT-TP-004 shows the pier foundation of Norfolk Southern Railway above the tunnel profile. The note states "exact details unknown". Please confirm the designer evaluated the stability of the pier during the tunnel excavation.*

A24 **Designer evaluated the settlement of the Norfolk Southern pier foundation shown on ORT-TP-004. Designer's analysis assumed full adherence to the Contract Documents pertaining to the ORT and A48 adit construction. Norfolk Southern provided Engineering Approval for the ORT design; however, as noted in the Contract Documents, Norfolk Southern's protocols require Contractor submittals during construction for Norfolk Southern's review of the Contractor's proposed work, schedule, means and methods, etc. Construction phase coordination with Norfolk Southern shall be provided at Contractor's own cost.**

Q25 *LD of Performance Bond - The Performance Bond form states "actual damages caused by delayed performance or non-performance of the Principal including liquidated damages". The LD is capped at 5% of the Contract Value in Addendum-2 and actual damage is not applied. Please confirm.*

A25 **See Section B, Item 9, CHANGES TO CONTRACT DOCUMENTS.**

Q26 *Extended Work Hours - Secant Piles & Slurry Walls - In order to attempt to achieve the current completion date it will be required to work multiple shifts Monday-Friday to install slurry walls and secant piles at sites AS1, A58, A48, O41, O14, and O27. Please revise the Specifications to extend the allowable work hours to accommodate two 10-hour shifts at these sites.*

A26 **No changes to the Contract Documents. It is the Contractor's obligation to comply with Section 01 32 13, Part 1.3.C. Given that the additional time has been added to the Contractual Milestones as amended in Addendum 10, work not currently exempt per Specification 01 32 13 that necessitates additional work hours will be permitted following Contractor's receipt of " …written permission of the Owner and the approval of the Municipality in which the Work is to be performed."**

Q27 *Extended Work Hours - Secant Piles & Slurry Walls Sites O06A and O7 Only - In order to attempt to achieve the current completion date it will be required to work multiple shifts Monday-Friday to install slurry walls and secant piles at sites O06A and O7. Please revise the Specifications to extend the allowable work hours to accommodate two 10-hour shifts at these sites.*

A27 **No changes to the Contract Document. It is the Contractor's obligation to comply with Section 01 32 13, Part 1.3.C. Given that the additional time has been added to the Contractual Milestones as amended in Addendum 10, work not currently exempt per Specification 01 32 13 that necessitates additional work hours will be permitted following Contractor's receipt of " …written permission of the Owner and the approval of the Municipality in which the Work is to be performed."**

Q28 *I have the following questions for the Bubbler System, Section 40 72 46.*
1. What company sells the "Basis for Design" as I cannot find a vendor for what is described in the specification?
2. I cannot find this device on the INSTRUMENT LIST. From the FUNCTIONAL CONTROL NARRATIVES, I see this device for Sites A58 and O27. Please confirm only 2 Bubbler Systems are required.
3. If I am expected to build this Bubbler System from scratch, please confirm the pump requirements for the 2 redundant air pumps, including air flow (SCFM), voltage, and max amperage available.
4. Please indicate if the parts required to build a Bubbler System are indicated on the Contract Drawings.
5. Please indicate if an air storage tank is required for the compressors and what size.

A28 **1. The Bubbler System is a bespoke performance based solution. A Basis for Design vendor is not included in the specification due to the nontypical criteria. A listed system will need to be provided to meet the performance criteria provided.**
2. There are to be two separate bubbler systems provided/installed; one at O27 and one at A58.
3. The Bubbler System is a bespoke performance specification for a listed system. Sizing of individual components is not included and are to be chosen based on the performance criteria. The voltages available at both sites (O27 and A58) are 480/277V and 208/120V. It is preferred that motors larger than 5hp be operated at 480V, 3-phase. Preliminary electrical circuit provisions and initial load estimates are shown in the panelboard schedule on drawings O27-EL-109 and A58-EL-412.
4. The Bubbler System is a bespoke performance specification. Full component lists are not included and are to be chosen based on the performance criteria.
5. The Bubbler System is a bespoke performance specification. Sizing of individual components is not included and are to be chosen based on the performance criteria.

Q29 *On drawing ORT-MD-013 section C shows grouting behind all walers where they do not contact the secant piles to ensure full bearing as shown in note 3 on that page. Is it a requirement to install grouting in every area that the waler is not in contact with the secant pile? Is this required to be grout or is shotcrete for the detail acceptable*

A29 **As Note 3 of ORT-MD-013 states "Ensure full bearing is provided between all piles and walers… with non-shrink grout for secant piles". Therefore, it is confirmed that it is a requirement to install non-shrink grouting in every area that the waler is not in contact with the secant pile. As the note states, non-shrink grout is required. Refer to Section 31 40 00 Part 3.3.E for further details for non-shrink grout requirements. Shotcrete will not be permitted unless the Contractor can prove that the mix design will provide equivalent properties, including non-shrinkage requirement, early strength, and flowability to fill the tight gaps between the walers and piles.**

Q30 *In order to better align the contract's warranty construct with industry standards and resolve concerns raised by our surety, please consider the following suggested modifications to the first sentence of Section 3.59 of the General Conditions and the definition of "Defective Work" in Section 3.3(I) of the General Conditions:*
Section 3.59: "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…"
Section 3.3(I): "DEFECTIVE WORK refers to Work that~~, in the sole discretion of the Owner, is unsatisfactory, faulty, or deficient, or~~ does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or has been damaged prior to Final Acceptance of the Work (unless responsibility for the protection from damage thereof has been assumed in writing by the Owner)."

A30 **In General Contract Conditions, Article 3.59 WARRANTY, "..of the highest quality and best obtainable in every respect" will be deleted. See Section B, Item 16, CHANGES TO CONTRACT DOCUMENTS. Section 3.3(I): DEFECTIVE WORK will remain unchanged.**

Q31 *To better align with industry standards and resolve concerns raised by our surety, please revise Section 3.34(I) of the General Conditions to address mixed-cause delays (for example, by incorporating a "to the extent" concept), so that any partial responsibility of the Contractor—or of a third party—does not eliminate relief in its entirety for the delay event in question. Suggested language modifications follow:*
Section 3.34(I): "Contractor agrees that it shall have no claim for an increase in the Base Bid Amount, any Specific Allowance or the Contract Sum for delay, disruption, interference, ~~acceleration~~, or hindrance to the extent caused~~, in whole or in part, by reason of any delay events not proximately caused by Owner~~ by Contractor. ~~Contractor agrees to accept, as its sole and exclusive remedy, an extension of time unless the Owner elects to accelerate Contractor's performance in lieu of granting an extension of time.~~ If Owner elects to accelerate Contractor's performance due to delays ~~in no way related to actions or omissions~~ not the fault of the Contractor, subcontractor, or any entity for which Contractor may be responsible, Owner agrees to adjust the Base Bid Amount, any Specific Allowance, or the Contract Sum pursuant to Paragraph 3.32 of this Agreement."

A31 **No changes to the contract documents will be made.**

Q32 *While we appreciate the addition of Section 3.61 regarding Contractor's limit of liability, it is our position the cap should be 50% of the contract value (given the size, duration, and complexity of the Project). Further, the exclusions should be reduced to losses covered by insurance, reasonable indemnity obligations and certain negative conduct (fraud, willful misconduct, recklessness, criminal conduct, bad faith or gross negligence). Again, we appreciate ALCOSAN's revision of 3.61 to date, but we ask that ALCOSAN consider broadening its revisions as suggested below:*
Section 3.61: "The Contractor's total liability for all claims, damages, losses, and expenses arising out of or relating to this Contract will be limited to ~~100%~~ 50% of the Contract value, but this limitation will not apply to ~~any amounts expressly payable pursuant to this Contract or any amounts entitled to be set-off, or Contractor's liability, to the extent that~~:
~~A. Such losses have been covered by insurance pursuant to this Contract.~~
~~B. Suc~~h A. ~~l~~Losses ~~are that have been actually~~ covered by ~~and paid from~~ the proceeds of insurance carried by the Contractor regardless of whether such policies are required pursuant to this Contract.
~~C. Under any indemnity pursuant to this Contract where such indemnity relates to claims asserted and/or losses suffered by any third party including those listed as indemnified parties in Article 3SC, Section 3.10, Indemnification~~
B. Contractor's indemnity obligations but only to the extent they relate to third-party claims for bodily injury, sickness, disease, death, or physical damage to tangible property and only to the extent caused by the negligent acts or omissions or willful misconduct of the Contractor.
~~D~~C. Loss arising out of Contractor's fraud, willful misconduct, recklessness, criminal conduct, bad faith or gross negligence."

A32 **The Contractor's total liability was changed to 50% in Addendum #11 (RFI item A52, Section B, Item 21). No other changes will be made to this section.**

Q33 *Please clarify if the open-book invoicing process for Bid Item 115 will be for material delivered to the jobsite, material mixed, or material injected.*

A33 **Payment will be made for material delivered to the jobsite.**

Q34 *Please confirm that Bid Item 115 covers the costs for grout material of mixes that are not used in the trial and error process.*

A34 **Grout materials of mixes that are not used in the trial and error process will not be paid for by Bid Item 115.**

Q35 *Section 1.7 B of Specification 31 41 00 states that any redesign proposed by the Contractor shall be in accordance with the standards, minimum dimensions, and tolerances referenced in the Specification and Contract Drawings.*
Our interpretation is that redesigns of support of excavation (SOE) systems, such as Sheet Piling or Secant Pile SOE, must comply with the minimum dimensions and tolerances outlined in Specification Sections 31 41 16 and 31 57 00, respectively. Additionally, those referenced specifications require submission of design calculations for contractor-proposed alternate SOE systems.
We request confirmation that contractor-proposed redesigned SOE systems must also include the contractor's means and methods for execution and are not required to rely on the means and methods dictated in the original plans and specifications, provided that the redesigned SOE meets all minimum design requirements of the as-designed system.

A35 **For bidding purpose, Contractor's means and methods shall adhere to the technical requirements dictated in the Contract Drawings and Specifications while providing redesigned SOEs that meet the minimum design requirements of the as-designed systems. Any variations may be submitted in accordance with Article 3 Exhibit B.**

Q36 *Section 2.1 G references the need to design mixes for shrinkage tests per ASTM C157. Will all mix designs regardless of strength or use (i.e permanent vs temporary works) need to have shrinkage tests performed to be approved for use on the project?*

A36 **Refer to this Addendum, Answer A19.**

Q37 *With reference to blasting work hours, Specification 01 32 13 Construction and Schedule Constraints Part 1.3.B.3 states: "Blasting: Detonation / Firing of Explosives shall be limited to between the hours of 7:00 AM and 7:00 PM, Monday through Friday, and 9:00 AM to 5:00 PM, Saturdays." The same specification states, under Part 1.3.D.5 on work exempt from Regular Work Hours: "Underground work including probing, grouting, drilling, maintenance and other underground non-blast-related work for drill and blast headings of starter/tail Tunnels, SMRT, DWT, connecting adits between shafts and tunnels, and shaft to tunnel connections." Based on experience, such restrictions typically apply to surface or near-surface activities; given tunnel depth, limitations are not necessary for non-TBM blasting. Please confirm the blasting hours limitations can be waived for non-TBM tunnels blasting.*

A37 **No changes to Contract Documents.**

Q38 *We kindly request ALCOSAN to review their response to Question No. 22 included in Addendum 5 as it did not address the issue. As the GBR yet contains information which is defined "for bid purposes", plus other that is classified as "baseline statement" and other that has undefined purpose we kindly request ALCOSAN to confirm that:- All parameters, conditions, and baselines described in the GBR (e.g., stratigraphy, rock mass properties, groundwater inflows, gas conditions, etc.) are to be considered the contractual baselines;- The GBR is to be applied in its entirety, rather than only selected definitions or portions, when evaluating potential DSC events. This clarification is important to ensure a consistent interpretation of the GBR during pricing, risk allocation, and contract administration, and to avoid future ambiguities in the management of potential DSCs.*

A38 **All parameters, conditions, and baselines in the GBR are contractual except where they are described for information only. A specific interpretation and application of the GBR, when evaluating DSC events, cannot be mandated. Definitions and procedures for the GBR and DFCs were amended in Addendum #2, Section B items 11,12, 13 and 14.**

Q39 *03 30 00 Cast-In-Place Concrete section 2.4.C states that batch plants shall be central mixing. Many plants in the area are dry batch, as opposed to central batch. These plants have successfully produced high quality concrete for many years and are approved by multiple local, state, and federal agencies. Even the producers with central mix capabilities have dry batch plants as their back-up plants. This requirement that all concrete must be central mixed will limit the availability of suppliers and increase the price that ALCOSAN will ultimately be paying for concrete with no benefit to the project. We request that this specification be modified to allow concrete from both central mix and dry batch plants.*

A39 **No changes to this requirement.**

Q40 *Technical Specification Section 31 71 16 Subsection 3.1K. 1. states that "A licensed and preapproved Blaster-In-Charge must be on each site to sign for and take delivery and control of explosive material from the explosives supplier. A licensed Blaster-in-Charge must also be physically present at all sites to directly oversee the use and security of explosive materials at all times when explosives are handled and transported blast locations; when holes are charged; rounds are tied in; sites are cleared, guarded, and secured; warning signals are sounded; and blasts are initiated and the all-clear signal is sounded. Under no circumstances will a single Blaster-in-Charge be allowed to oversee these activities concurrently at two or more sites." Please verify that if the Contractor is blasting at multiple locations during the same shift that a Blaster-in-charge will be required with the experience detailed Specification Section 31 71 16 Subsection 1.4C.1.*

A40 **Confirmed.**

Q41 *Wedge Wire Screen Panel Size - Some of the panels for this project are quite large and span a large distance. With the static and hydrodynamic loads they have specified, the panels will be very heavy built and very costly. For example, one of the sets of panels has a width of 113 inches. This will require ¼" x 10" tall support bars on 3" centers, which isn't even possible to build. I would like to discuss this with the engineer and come up with a feasible design.*
It may be a possibility to have more vertical structure behind the screens to carry this load and span a shorter distance. This will make the support bars smaller and increase the distance between them.

A41 **No change to Contract Documents. For clarification, the Wedge Wire Screen dimensions shown on the Contract Drawings are geometric control dimensions. Notes on ORT-MD-039 specify that "wedge wire screen manufacturer shall be responsible for the design of the wedge wire screen panels and attachment of screen panels to screen support structure" based on the loads given and Specification Section 46 21 56 – Racks and Screens.**

Q42 *Wedge Wire Screen Impact Forces - The other issue is the impact force loads they have called out that the screens must withstand. They are wanting a .090" wire with a slot opening of 1". This does allow for much material to take an impact force of any kind. That wire size is much too small and there isn't enough of them to result in a durable screen design. I would recommend our Profile Bar screen with a much heavier wire size to help make this a better end product. The design details don't provide much detail on how to calculate the effects of the impact for on the screen. Such as, how large of an area is this force going to contact on the screen surface.*

A42 **Refer to this Addendum, Answer A41.**

Q43 *Wedge Wire Screen Support Bars - The specification mentions 3/16" x 1-1/2" support bars in the screen details. Support bars of this size may possibly work for some of the narrower panels, but I haven't gotten into it that far yet. It is our recommendation that all support bars be a minimum of ¼" thick. This will keep the bars straight during fabrication, reducing warpage and drawing that occurs when welding on thinner materials.*

A43 **Refer to this Addendum, Answer A41.**

Q44 *Pre & Post Construction Surveys - In regard to Inspection Coverage Zones – Are the pre-construction condition surveys of buildings limited to the LOD along the tunnel? For example, on Ridge Road, do the buildings that are outside the LOD need a condition survey? Is it only the roadway that needs a survey because it is inside the LOD?*

A44 **Refer to this Addendum, Answer A10.**

Q45 *Pre & Post Construction Surveys - Due to the anticipated number and size of the pre-construction surveys, is there some flexibility with the requirement that photographs and videos should not be collected more than 6 months prior to construction?*

A45 **No change to Contract Documents.**

Q46 *Pre & Post Construction Surveys - The requirement for video camera positions does not seem relevant for building condition survey of exteriors and interiors. In many cases the documentation of pre-existing conditions would be conducted using a combination of video and photographs to provide the best representation of the overall freeze-in-time condition. Is there some flexibility in this area?*

A46 **No change to Contract Documents.**

Q47 *Round Lengths - Specification Section 31 17 16 lists stations in the drill and shoot tunnels and elevations in the shafts where round lengths are restricted to 4 feet or 6 feet (in the case of O27 Shaft). Also the total unrestricted round lengths are limited to 8 feet horizontally and 10 feet vertically. The restrictions are creating significant schedule impacts and additional cost to the project. Would Alcosan consider removing these restrictions and allow the Contractor's Blasting Consultant to design and monitor the shots to adhere to the vibration limits given in Section 31 71 16?*

A47 **No change to Contract Documents.**
For clarification, these restrictions are applied not only as part of the vibration limits but also excavation stability immediately after blasting, which is highly related to unsupported round length. In addition, the Contractor shall adhere to Section 31 71 16 Part 3.1.K.10 relating to further blast restrictions and cost inclusion in the bid price.

Q48 *Non-TBM Tunnel Muck Disposal - Regarding the Non-TBM Tunnel Mining it is understood that over-excavation beyond the A-Line and the associated transportation of spoils to the surface is incidental to the Non-TBM Tunnel Mining and Initial Support Pay Items. However, the pay item quantities for the Tunnel and Shaft Muck Handling, Testing, Transport, and Disposal Pay Items do not appear to correspond with the total excavated material (A-Line plus Overbreak) quantity. The measurement description for the Handling, Testing, Transport, and Disposal Pay Items simply states the payment quantity is to be measured by the Bank Cubic Yard. Given the multiple soil classifications and associated disposal requirements for excavated material there is significant risk to the contractor if the Handling, Testing, Transport, and Disposal of the excavated material beyond the A-Line is incidental to the tunnel mining and initial support pay items. work. Please confirm that the Handling, Testing, Transport, and Disposal of the overbreak excavated material beyond the A-Line of the Non-TBM Tunnels will be paid under the Unit Prices for the Non-TBM Tunnel Mining and Initial Support Pay Items.*

A48 **No change to Contract Documents.**

For clarification, the pay item quantities are based on bank cubic yards within the A-Line only as described in the bid item, NOT (*A-line plus Overbreak)* as indicated in the RFI.

Q49 *Specification 31 23 20 Section 3.6 I. states that "the grouting of a stage within a hole shall be considered to be complete when the grout take reaches refusal as defined in this Section. After the grouting of a stage within a hole is completed, maintain the pressure in the hole by closing the shut-off valve and leave the valve in place until the grout has set sufficiently to be retained in the hole. Only after the grout has set or gelled shall the hole be redrilled and washed."*
Question: please confirm that the term "grouting of a stage" in the above context is referring to the full extent of the drilled hole and not a single 10'/20' "stage". I.e.: For a hole drilled 50 ft below the standpipe, please confirm that the contractor would be allowed to grout multiple 10/20 ft stages from the tip elevation to the bottom of the standpipe in a single shift without having to wait on grout to set at each 10'/20' interval.

A49 **"Grouting of a stage" means grouting of a single stage of 10' as defined Section 31 23 00 Part 3.6.C, it is NOT referring to the full extent of the drilled grout hole. Refer to Addendum 008 Q9/A9 and Q26/A26 and Addendum 008 Q21/A21 for additional information.**

Q50 *Specification 31 23 20 Section 3.6 M. 7. States that "If packer tests measure no water take, or if they demonstrate that rock mass permeability has been reduced by a minimum of two orders of magnitude compared to the values measured in the packer testing performed during design and included in the GDR and/or GBR, the grouting stage at that location will be considered complete."*

Question #1: The GDR does not contain any packer testing results for some sites (A48, A58, O14) where pre-excavation grouting will be performed. How will grouting be considered complete in these locations?
Question #2: For the sites where packer testing results are available in the GDR, some areas of the formation show permeability of less than 1E-5. When working in these areas, it is expected that water pressure tests will show some, yet minimal, water take. However, it is unlikely that grouting will be able to reduce permeability by two orders of magnitude to 1E-7. Please consider including an additional criterion for cases such as this indicating a threshold permeability (say 1E-5) below which grouting would be considered complete.

A50 **Answers to both questions – Criteria is revised to "If packer tests measure no water take, or if they demonstrate that rock mass permeability reaches 0.5E-6 or less~~, has been reduced by a minimum of two orders of magnitude compared to the values measured in the packer testing performed during design and included in the GDR and/or GBR~~, the grouting stage at that location will be considered complete".**
See Section B Item 10 for CHANGES TO CONTRACT DOCUMENTS.

Q51 *Are barges able to sit outside of the LOD/LOC on sites O27, O41 and A58, if required? After discussions with a local barge supplier, it was indicated that no further permitting would be required as long as the barges remained outside of the navigation channel. Does ALCOSAN have any specific requirements regarding this?*

A51 **The use of barges is considered means and methods and falls under the full responsibility of the Contractor. Bidders are advised that the Owner will have concurrent construction projects active along the north shore of the Ohio River during ORT construction. The Contractor is required to coordinate with the Owner for all work outside of the Contract Document LOD/LOC.**

In addition to coordinating with the Owner about potential proposed barge use, Contractor must, in accordance with Contract Documents such as 01 31 00 Permitting and Approvals and 01 31 13 Project Coordination, perform agency coordination as required to construct the work in accordance with applicable laws and regulations.

Q52 *Per Project Specification Section 31 41 16 § 2.1.F.1.C., steel sheet pile interlock "sealant shall be applied through the interlocks during installation."*
Question: Can interlock sealant in steel sheet pile interlocks be applied prior to delivery?

A52 **No changes to Contract Documents.**

Q53 *Project Specification Section 35 31 30 § 1.8.H. details leakage criteria for the IPP SOE/cofferdam. However, unlike Section 31 41 16, interlock sealant is not required for the IPP.*
Question: To ensure leakage criteria is met for the IPP SOE/cofferdam, should interlock sealant be applied to IPP interlocks?

A53 **Interlock sealant is required. Refer to Section 35 31 30 Part 1.6.C.2.**

Q54 *Project Specification Section 35 31 30 § 1.6.D.4.c. indicates the annular cut around the IPP rock sockets to be filled with grout.*
Question: On site O41, based on the GBR, the toe of the pipes rarely hit rock – in instances where design toe elevation is achieved, but rock is not encountered, does the annular cut around the IPP still require grout fill?

A54 **Site O41 does not require IPP walls.**
If the RFI refers to O14 site where IPP wall is to be installed, the annular cut around the IPPs in soil does not require grouting.

Q55 *Addendum #9 Question 16 The question was whether it was the Owner's intention for the installation of the slurry wall support of excavation system to be installed in a non-stop 24 hour/day 7 day/week operation. The answer was "Yes, for panel excavations at the O27 and AS1 sites only…." Requiring the slurry wall panels to be excavated around the 24 hours per day, 7 days per week (i.e. non-stop) is problematic for many reasons.*
First, working 24/7 is not efficient from an operational and cost standpoint. There is no time for equipment maintenance and repairs. The crew will experience "burnout" within the first 2 weeks, resulting in a drop in efficiency while incurring double costs on Sundays.
Secondly, there is no technical reason that requires non-stop panel excavation to achieve a successful Slurry Wall installation.
Third, and most importantly, it is not good from a safety standpoint. It is well documented in the construction industry that accidents increase when working crews on extended shifts for long periods of time.
Lastly, the Section 01 32 13, Section 1.3 Work Hours, specifically excludes work at Sites AS1 and O27 past 8:00 PM Monday thru Saturday and prohibits work on Sundays without the written permission of the Owner and the approval of the Municipality in which the work is performed. On the recently bid ALCOSAN WWPS project the original Slurry Wall specification requirement for continuous excavation was similar. An almost identical question was asked for the same reasons mentioned above and the response (WWPS Addendum #4 Question #35) was: No. Continuous excavation means that once slurry wall excavation begins on a specific panel, that panel must be fully excavated before proceeding to another panel. Requiring Slurry Wall panel excavation on a 24 hour basis Monday through Friday is more reasonable and will achieve a technically acceptable Slurry wall at less costs and with less chance of accidents and injuries.
Question / Request: Please reconsider requiring Slurry Wall panel excavation on a 24 hour /7 day per week basis and revise it to a maximum of a 24hour /5 days per week basis.

A55 **Section 31 56 00 (Slurry Wall) Part 3.4.B.4 has been revised to:**
"Unless otherwise approved by the Owner, the excavation of any single panel shall be continuous once excavation has commenced within the permitted work hours at Sites AS1 and O27. The Contractor may perform 24 hour / 5 workdays operations continuously as site conditions dictate or at the direction of the Owner".
This answer replaces Addendum 009 A16. See Section B Item 11 for CHANGES TO CONTRACT DOCUMENTS.

B. CHANGES TO CONTRACT DOCUMENTS

1. DELETE the first paragraph in Article 3.35 of the General Contract Conditions; (CHANGES ARE NOTED IN RED):

   3.35 PROGRESS ESTIMATES AND APPLICATIONS FOR PAYMENT
   ~~The parties hereto agree that Act 142 of 1994, amending the Public Works Contract Regulation Law (73 P.S. Section 1621) shall not apply to any Contract terms between the Owner and the Contractor.~~

2. Supplemental Contract Conditions Article 3SC - ADD Item 3.85 (noting that 3.84 was added in Addendum #1) (CHANGES ARE NOTED IN RED):

   3.85 CONTRACTOR ACCESS TO WORK
   The Owner will furnish site access within the Limits of Disturbance (LOD) / Limits of Construction (LOC) boundary shown on the Contract Drawings. Contractor shall provide for any additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

3. APPENDIX A - TECHNICAL SPECIFICATIONS, Section 01 22 00 – Measurement and Payment, BID ITEM 33. Standby Due to Gas in Tunnels, Adits and Shafts is REVISED:

   a. REVISE BID ITEM 33. Standby Due to Gas in Tunnels, Adits and Shafts as follows (CHANGES ARE NOTED IN RED):

   BID ITEM 33, Standby Due to Gas in TBM Tunnels, Non-TBM Tunnels/Adits and Shafts

   These ~~This~~ BID ITEMs shall be used to compensate the Contractor in the event that the respective tunnel/adit mining operations and/or shaft construction operations are disrupted and crew placed under standby due to gas encountered.
   2. For pricing and schedule purposes, the Contractor should assume a maximum of 720 crew hours ~~accumulated 30 working days~~ for each item for the entire duration of the Project.
   3. The Contractor must submit in the Escrow Bid Document a detailed breakdown of how the unit price (per ~~day~~ crew hour) was ~~arrived at~~ calculated, including labor, equipment, etc. These ~~This~~ unit prices ~~bid~~ shall include all costs of maintaining equipment and auxiliary support services to maintain a safe workspace, including:
      a. The Contractor's cost, including overhead and profit, for self-performed work and work performed by Subcontractors (in accordance with the Contract Documents), not including items excluded by the Contract, such as TBM ownership costs, etc.

b. All costs required to initiate full work capacity within ~~24~~ 8 hours after the event has cleared and/or been made safe for work. All costs associated with the remobilization period will be included for payment under this item.

4. Ventilation requirements for gases encountered during excavation are described in Section 01 35 26 – Safety Provisions and the tunnel- and shaft-related Sections of Division 31 – Earthwork. The provision of ventilation in compliance with OSHA regulations is a condition precedent to any payment under these bid items being triggered. ~~Ventilation to comply with OSHA regulations will be required before any standby is started due to gases.~~

5. Payment for this item shall be made on a Unit Price basis per ~~workday~~ crew hour of standby due to gases in accordance with the Contract Documents. Should the contractor encounter hazardous gas, the duration of any construction delays, will be measured starting one hour after hazardous gas is detected and the shutdown occurred, and end immediately after the gas has cleared and measured at acceptable levels.

4. SUPPLEMENTAL CONTRACT CONDITIONS ARTICLE 3SC - Exhibit A-3SC - INSURANCE - REPLACE Professional Liability Insurance paragraph [PAGE Exhibit A-3SC-6] in its entirety with the following: (CHANGES ARE NOTED IN RED):

Professional Liability Insurance

In the event that Contractor employs or retains professional engineering or land surveyor services for performing field engineering or preparing design calculations, plans and specifications, Contractor shall carry and/or require the retained engineers and land surveyors carry professional liability insurance with limits not less than $5,000,000 each occurrence and $10,000,000 in aggregate with respect to negligent acts, errors, or omissions in connection with professional services to be provided under this Contract and shall include rectification /mitigation coverage. Contractor and its consultants shall maintain such professional liability insurance during their entire design and construction work and for a period ~~two~~ five years after final payment and the Contractor shall furnish the Owner a Certificate of Insurance evidencing such professional liability insurance for its review and approval. In the event that occurrence-based policies are either commercially unavailable or economically impracticable, the Contractor may maintain claims-made insurance with at least thirty (30) days prior written notice to the Authority; however, the Contractor must also obtain, at the Contractor's expense, prior acts coverage with a retroactive date coinciding with the Effective Date of this Agreement ("nose") and such policy shall either (i) be renewed annually for a period of not fewer than five (5) years following Final Completion with substantially the same terms and conditions or (ii) include an extended reporting period endorsement or clause providing not less than five (5) years within which a claim may be made under the policy respecting the Contractor's performance of Work ("tail"); the cost of coverage for such five (5) year period shall be borne exclusively by the Contractor, or

Subcontractor(s) as the case may be, provided further that if such Professional Liability insurance is written on a claims-made basis then the per occurrence limits stated above shall apply per incident; and if commercially feasible, limits of liability shall apply on a per-project basis with a designated limit applying to the Job Site(s). The Contractor agrees that it shall be held strictly liable for any liability resulting from gaps in the required insurance coverage. The requirements set forth in this Section shall survive the expiration or earlier termination of this Agreement. All deductibles under such policies shall be for the account of Contractor.

5. APPENDIX A - TECHNICAL SPECIFICATIONS – Section 01 45 23, Part 3 – EXECUTION, 3.2 ZONE OF INSPECTION COVERAGE and Attachment 3.

   a. ADD the following text in its entirety to Section 01 45 23 – Part 3.2 as follows (CHANGES ARE NOTED IN RED):

      11. List of structures in the Zone of Inspection included in Attachment 3.

   b. ADD Attachment 3 – List of Structures in the Zone of Inspection Not Listed in Attachments 1 and 2 (12 pages), which is Attachment B to this Addendum.

6. APPENDIX B – CONTRACT DRAWINGS
   a. DELETE O27-ST-122 (Sheet 225 of 770) and ADD revised O27-ST-122 (Sheet 225 of 770), which is Attachment C of this Addendum.
   b. DELETE A48-ST-306 (Sheet 367 of 770) and ADD revised A48-ST-306 (Sheet 367 of 770), which is Attachment C of this Addendum.
   c. DELETE A58-ST-424 (Sheet 425 of 770) and ADD revised A58-ST-424 (Sheet 425 of 770), which is Attachment C of this Addendum.
   d. DELETE O06A-ST-806 (Sheet 629 of 770) and ADD revised O06A-ST-806 (Sheet 629 of 770), which is Attachment C of this Addendum.

7. APPENDIX C - GEOTECHNICAL BASELINE REPORT, Section 7 Ground Characterization, 7.9.4 SINTEF and Miller Number has been REVISED.
   a. REVISE the following in Section 7.9.4 as follows (CHANGES ARE NOTED IN RED):

      7.9.4 SINTEF and Miller Number
      Tests for Miller number and SINTEF rock drillability were performed on selected rock samples as presented in the GDR ~~Figures 8 and 9 provide baseline values for these properties~~ for Class 1 Sandstone and Class 2 Siltstone, respectively. Samples suitable for testing were not obtained for the other rock classes as explained in Section 7.9. Baselines for these parameters ~~other rock classes~~ are not provided.

8. APPENDIX A – TECHNICAL SPECIFICATIONS, Section 03 30 00 – Cast-in-Place Concrete
   a. DELETE Section 03 30 00 and ADD revised Section 03 30 00 in its entirety, which is Attachment D of this Addendum.

9. BONDS, CERTIFICATES, AND STATEMENTS Article 5, Performance Bond – REPLACE the 3rd paragraph [Page 5-1] as shown below. (CHANGES ARE NOTED IN RED):

   NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the Principal shall faithfully perform, fulfill and faithfully keep all undertakings, duties, covenants, terms, conditions and agreements (including any warranties) agreed by it to be performed and kept at the time and in the manner provided in the Contract and related Contract Documents, as the same may from time to time be amended or altered and shall defend, indemnify and save harmless the Owner, its officers, agents, Board members and employees from any and all cost, damage, liens and demands by reason of the manner in which such undertakings are performed or kept and from any expense incurred by reason of the Principal's failure to perform and keep all its undertakings under the Contract or Contract Documents and from damages growing out of the manner of performance of said Contract Documents so set forth in the Contract Documents and ~~actual~~ damages caused by delayed performance or non-performance of the Principal as measured by ~~including~~ liquidated damages, or, if liquidated damages are determined to be unenforceable, by actual damages, and also including but not limited to patent, trademark, copyright infringements or other intellectual property violations, as set forth in the Contract Documents, then this obligation shall become void and of no effect; otherwise it shall remain in full force and effect.

10. APPENDIX A – TECHNICAL SPECIFICATIONS, Section 31 23 20 Probing, Pre-Excavation Drilling, and Grouting, Part 3 – EXECUTION, 3.6.M.7 has been revised.
    a. REVISE Section 31 23 20, Part 3.6.M.7 as follows (CHANGES ARE NOTED IN RED):

       7. If packer tests measure no water take, or if they demonstrate that rock mass permeability reaches 0.5E-6 or less ~~has been reduced by a minimum of two orders of magnitude compared to the values measured in the packer testing performed during design and included in the GDR and/or GBR~~, the grouting stage at that location will be considered complete.

11. APPENDIX A – TECHNICAL SPECIFICATIONS, Section 31 56 00 - Slurry Wall, Part 3 – EXECUTION, 3.4.B.4 has been REVISED.
    a. REVISE Section 31 56 00, Part 3.4.B.4 as follows (CHANGES ARE NOTED IN RED):

       4. Unless otherwise approved by the Owner, the excavation of any single panel shall be continuous once excavation has commenced within the permitted work hours at Sites AS1 and O27. The Contractor may perform 24

hour / 5 workdays operations continuously as site conditions dictate or at the direction of the Owner. At a minimum, check the verticality of the panel every 10 feet of excavated depth as excavation proceeds or as directed by the Owner. These interim verticality checks shall be performed deploying an ultrasonic technology (e.g., Koden, or equivalent as applicable) independent of on-board measurement tools after withdrawal of the excavation equipment. If the verticality exceeds specified limits, take corrective measures to bring the panel to within the specified limits.

12. APPENDIX A – TECHNICAL SPECIFICATIONS, Section 01 31 00 – Permits and Approvals, Attachment 11:
    a. ADD Attachment 11 – City of Pittsburgh DOMI ROW Permits associated with six near surface sites in Pittsburgh (13 pages), which is Attachment E of this Addendum.

13. APPENDIX B – CONTRACT DRAWINGS
    a. DELETE O14-ST-616 (Sheet 556 of 770) and ADD revised O14-ST-616 (Sheet 556 of 770), which is Attachment F of this Addendum.
    b. DELETE O14-ST-619 (Sheet 559 of 770) and ADD revised O14-ST-619 (Sheet 559 of 770), which is Attachment F of this Addendum.

14. APPENDIX A – TECHNICAL SPECIFICATIONS, Section 31 71 19 TUNNEL BORING MACHINE, Part 1 - GENERAL and Part 2 – PRODUCTS have been REVISED.
    a. ADD Section 31 71 19, Part 1.1, G as follows (CHANGES ARE NOTED IN RED):

    G. The Contractor will provide a TBM Model. Contractor will engage the tunnel boring machine manufacturer to construct and deliver to the Owner one (1) realistic looking 1:14 scale model of the tunnel boring machine proposed to construct the Ohio River Tunnel. The model will be delivered complete with all appurtenances.

    b. ADD Section 31 71 19, Part 2.6 as follows (CHANGES ARE NOTED IN RED):

    2.6 TUNNEL BORING MACHINE MODEL
    A. Construct and deliver one (1) 1:14 scale, realistic looking model of the Ohio River Tunnel, Tunnel Boring Machine
        1. Model will include a minimum of one (1) Trailing Gantry, including the Control Cabin.
        2. Model will include a front shield with rotating cutting wheel.
        3. The model will include cutouts in the front shield and the tunnel boring machine showing the internal technical features of the machine.

4. Model will include lighting which highlights the internal technical features of the machine.

B. Provide a clear display enclosure to house and display the tunnel boring machine model.

C. Provide protective travel (Flight Compliant) case(s) to carry model segments and parts.

D. Operation Manuals and maintenance instructions will be provided on a USB drive in an open (non-security protected) PDF format.

1. The model and all appurtenances will be shipped to the Allegheny County Sanitary Authority, 3300 Preble Avenue, Pittsburgh, PA 15233; Attention: Michael Lichte, PE, Director of Regional Conveyance. Shipping shall include all duties or fees for export from the country of origin and import into the United States, and all applicable sales and use taxes of the United States and of the Commonwealth of Pennsylvania.

15. APPENDIX A – TECHNICAL SPECIFICATIONS, Section 31 09 13, Part 2 – PRODUCTS, 2.1 MATERIALS, 2.1.E Crack Gauges (CG) has been REVISED.

a. REVISE Section 31 09 13, Part 2.1.E.2 as follows (CHANGES ARE NOTED IN RED):

2. In addition to the crack gages shown on the Contract Drawings, provide another 1,000 ~~200~~ crack gauges to be installed and monitored by the Contractor at locations determined during pre-construction inspection as required in Section 01 45 23 – Pre-Construction and Post-Construction Inspections, or as directed by the Owner.

16. Article 3.59 WARRANTY, of Article 3 General Contract Conditions – MODIFY the first sentence [page 3-63] as shown below. (CHANGES ARE NOTED IN RED):

3.59 WARRANTY

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.

Addendum No. 12

Attachment A

APPENDIX E - SUPPLEMENTAL INFORMATION (FOR INFORMATION ONLY)

- Section 5.5.5 Existing Owner Interceptor Exhibits (8 sheets including Appendix E fly sheet)

Addendum 12

Attachment A

APPENDIX E – SUPPLEMENTAL INFORMATION (FOR REFERENCE ONLY)

SECTION 5.5.5

ALCOSAN Saw Mill Run Shallow-Cut Interceptor Exhibits

Existing 42" Combined Sewer to Existing 48" Combined Sewer Previous Bypass Pumping Locations (For Reference Only)

Bypass pumping was previously completed to isolate a portion of the flow from the existing 42" combined sewer.Flow was bypassed from the existing 42" combined sewer at MH-N07 to the existing 48" combined sewer at MH-03A. This bypass pumping was accomplished on Parcel 6-A-172, which per the Allegheny County Real Estate Portal (December 2025) is owned by RCH Realty LP, 150 E. Main Street, STE 201, Carnegie, PA 15106.

Previous Project Suction Manhole: MH-N07

Previous Project Discharge Manhole: MH-03A

SAW MILL RUN BLVD TO S MAIN ST

STEUBEN ST TO SAW MILL RUN BLVD

STEUBEN ST TO SAW MILL RUN BLVD

SAW MILL RUN

SAW MILL RUN

STEUBEN

STEUBEN

STEUBEN

ELLIOTT

MAIN

NEPTUNE

VIOLET

SANCTUS

MH-N06

MH-N07

MH-N08A

MH-N09A

MH-N12B

MH-03A

MH-04

MH 1A

MH N-4A

MH 1C

O-14Z-06

O-14Z-04

O-14Z-02

O-14Z

MH-S02(ACOE)

MH-S03(ACOE)

S-03A

MH-06A

MH-06

MH-07

S-46-00_PS

42"

48"

30"

12"

8"

18"FWSA VCP

24"PWSA VCP

18"PWSA VCP

15"PWSA VCP

52"PWSA VCP

15"PWSA PVC

8"PWSA PVC

8"PWSA VCP

8"PWSA RCP

15"PWSA RCP

ALCOSAN Shallow-Cut Interceptor

Saw Mill Run Blvd. Woodruff St to O-14

Date: 1/07/2026 | Drawn By: MB | Page 1 of 7

0 25 50 100 150 200 Feet

0 5 10 20 30 40 Meters

1 inch = 100 feet 1 Cm = 12 Meters

Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983False Easting: 1,968,500.0000

Manhole
Outfall
Access Shaft
Regulator
ALCOSAN Sewer
Municipal Sewer
Parcel Boundary
Edge of Pavement

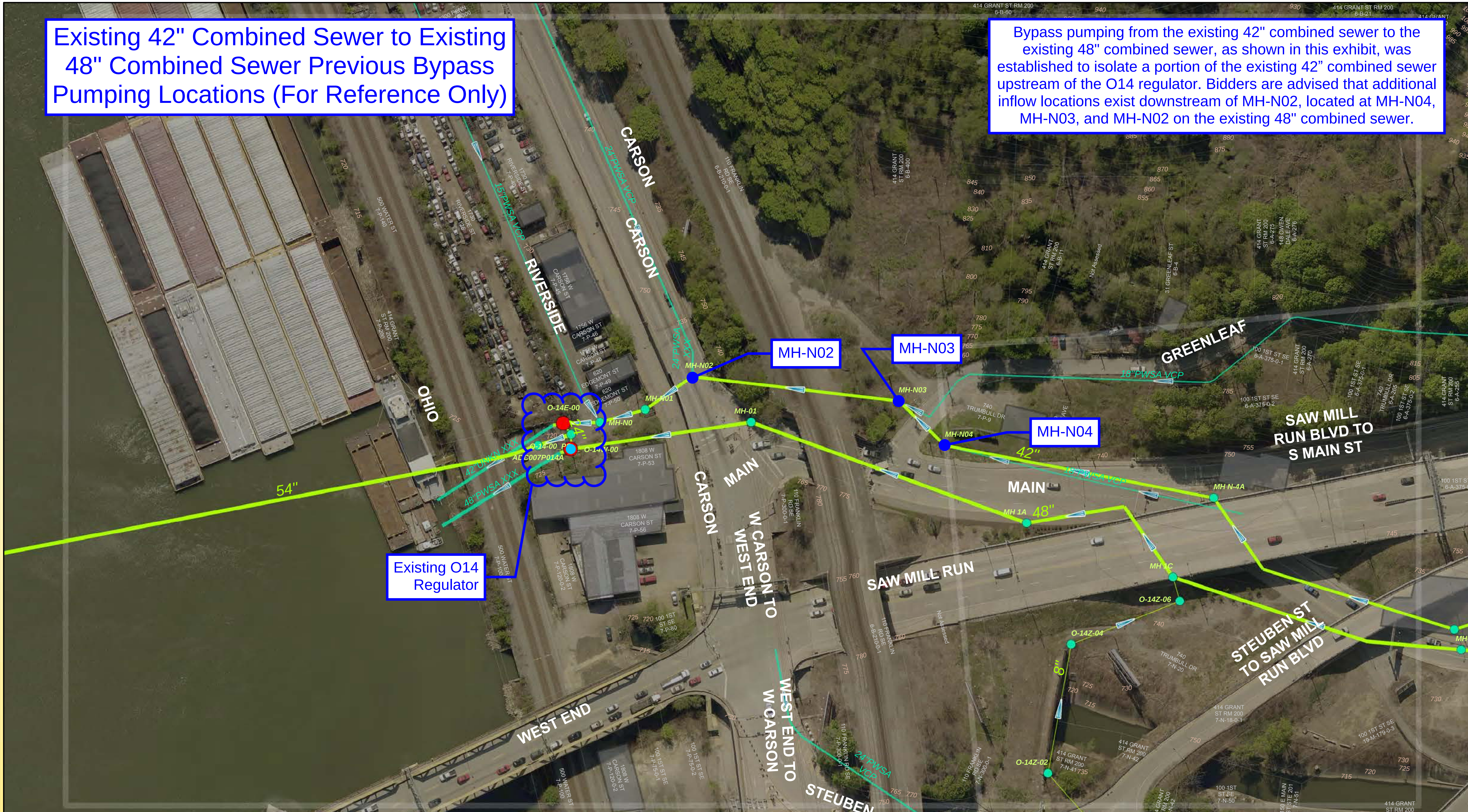
Parcel owners' contact information should be obtained from the Allegheny County Real Estate Portal website.

Map generated in ArcGIS 10.7.0, for general ALCOSAN reference use only. 09/19/2021 A.K.

Document Path: U:\ResConvey\GIS\2021\Arc\MapWorking\Maps\SawMillRun_11x17_03192021.mxd

Existing 42" Combined Sewer to Existing 48" Combined Sewer Previous Bypass Pumping Locations (For Reference Only)

Bypass pumping from the existing 42" combined sewer to the existing 48" combined sewer, as shown in this exhibit, was established to isolate a portion of the existing 42" combined sewer upstream of the O14 regulator. Bidders are advised that additional inflow locations exist downstream of MH-N02, located at MH-N04, MH-N03, and MH-N02 on the existing 48" combined sewer.



ALCOSAN Shallow-Cut Interceptor

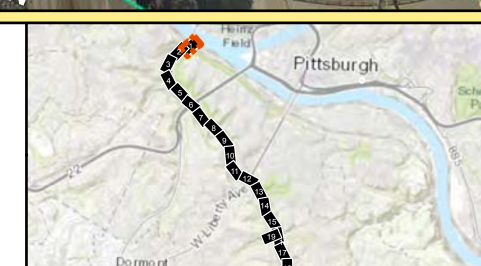
Saw Mill Run Blvd.
Woodruff St to O-14

Date: 1/07/2026	Drawn By: MB	Page 2 of 7

0 25 50 100 150 200 Feet
0 5 10 20 30 40 Meters
1 inch = 100 feet   1 Cm = 12 Meters

Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983False Easting: 1,968,500.0000

N



Symbol	Legend	Symbol	Legend
●	Manhole	ALCOSAN Sewer	
	Outfall	Municipal Sewer	
	Access Shaft	Parcel Boundary	
●	Regulator	Edge of Pavement	

Parcel owners' contact information should be obtained from the Allegheny County Real Estate Portal website.

Map generated in ArcGIS 10.7.0 for general ALCOSAN reference use only. 03/19/2021 A.K.

Existing 48" Combined Sewer to Existing 42" Combined Sewer Previous Bypass Pumping Locations (For Reference Only)

Bypass pumping was previously completed to isolate a portion of the existing 48” combined sewer. Flow downstream of MH-SMR-01-West was diverted from the existing 48" combined sewer to the existing 42" combined sewer in coordination with the Owner.This flow diversion was accomplished on two parcels owned by the City of Pittsburgh (5-L-180 property address: 946 Saw Mill Run Blvd, Pittsburgh, PA 15220 and 5-L-207-0-1 property address: Saw Mill Run Blvd., Pittsburgh, PA 15220; tax billing address for both properties is City-County Building, 414 Grant Street, RM 215, Pittsburgh, PA 15219).

Previous Project Diverted Flow Downstream of SMR-01-West from 48" to 42" Sewer

Map generated in ArcGIS 10.7.0 for general ALCOSAN reference use only. 03/19/2021 A.K.

Document Path: U:\Reg\Convey\GIS\2021\Act\Maps\Working\Maps\SawMillRun_11x17_03192021.mxd

ALCOSAN Shallow-Cut Interceptor

Saw Mill Run Blvd.
Woodruff St to O-14

Date: 1/07/2026	Drawn By: MB	Page 3 of 7

0 25 50 100 150 200 Feet

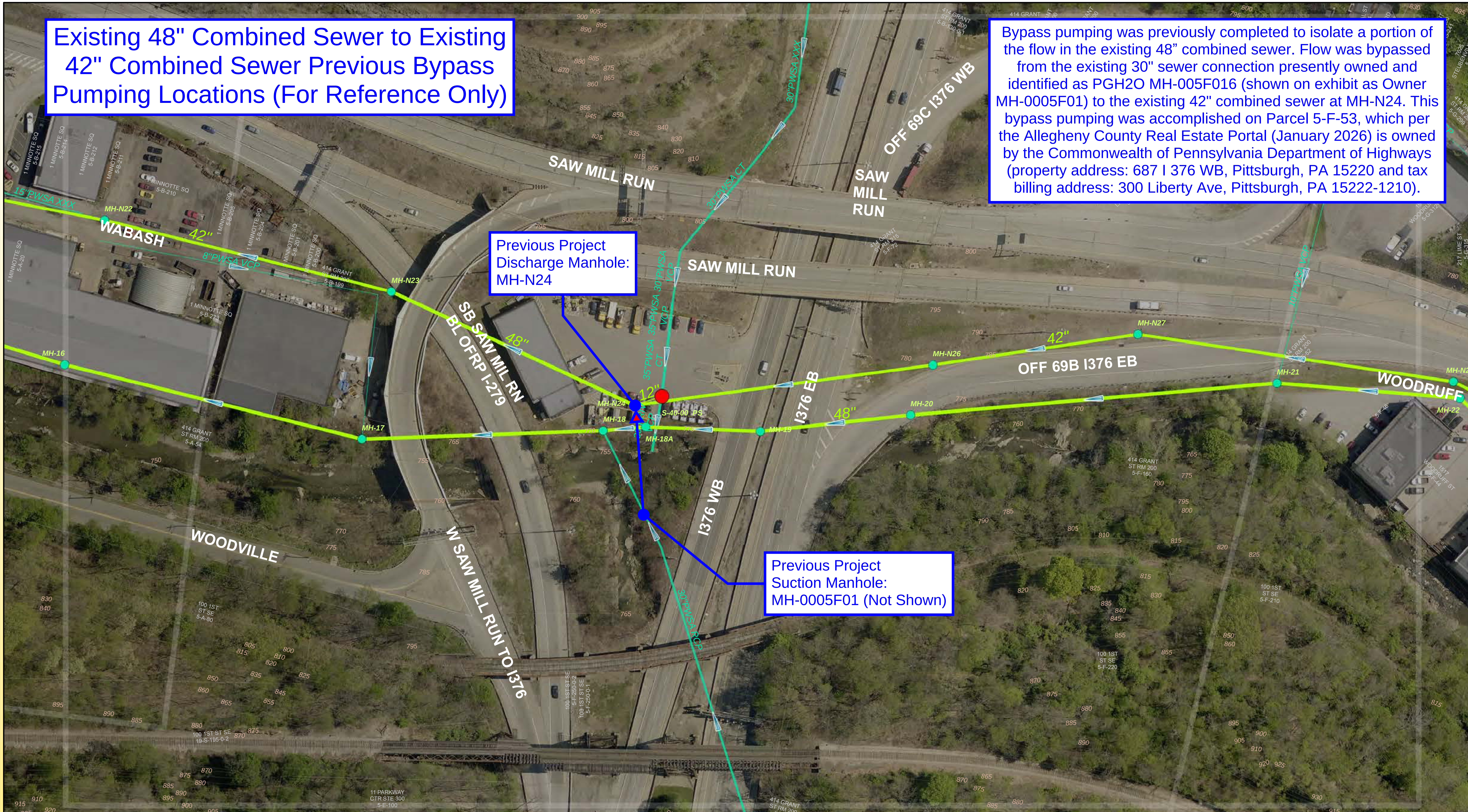
0 5 10 20 30 40 Meters

1 inch = 100 feet 1 Cm = 12 Meters

Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983False Easting: 1,968,500.0000

- Manhole
- Outfall
- Access Shaft
- Regulator
- ALCOSAN Sewer
- Municipal Sewer
- Parcel Boundary
- Edge of Pavement

Parcel owners' contact information should be obtained from the Allegheny County Real Estate Portal website.



Existing 48" Combined Sewer to Existing 42" Combined Sewer Previous Bypass Pumping Locations (For Reference Only)
Bypass pumping was previously completed to isolate a portion of the flow in the existing 48" combined sewer. Flow was bypassed from the existing 30" sewer connection presently owned and identified as PGH2O MH-005F016 (shown on exhibit as Owner MH-0005F01) to the existing 42" combined sewer at MH-N24. This bypass pumping was accomplished on Parcel 5-F-53, which per the Allegheny County Real Estate Portal (January 2026) is owned by the Commonwealth of Pennsylvania Department of Highways (property address: 687 I 376 WB, Pittsburgh, PA 15220 and tax billing address: 300 Liberty Ave, Pittsburgh, PA 15222-1210).
Previous Project Discharge Manhole: MH-N24
Previous Project Suction Manhole: MH-0005F01 (Not Shown)
SAW MILL RUN
SAW MILL RUN
OFF 69C I376 WB
WABASH
SB SAW MIL RN BL OFRP I-279
OFF 69B I376 EB
WOODRUFF
I376 EB
I376 WB
WOODVILLE
W SAW MILL RUN TO I376
42"
48"
12"
MH-N22
MH-N23
MH-N24
MH-N26
MH-N27
MH-N28
MH-16
MH-17
MH-18
MH-18A
MH-19
MH-20
MH-21
MH-22
S-48-00_PS
Pittsburgh

	ALCOSAN Shallow-Cut Interceptor **Saw Mill Run Blvd.** **Woodruff St to O-14**		
Date: 1/07/2026	Drawn By: MB	Page 4 of 7	

0 25 50 100 150 200 Feet
0 5 10 20 30 40 Meters
1 inch = 100 feet
1 Cm = 12 Meters

Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983False Easting: 1,968,500.0000

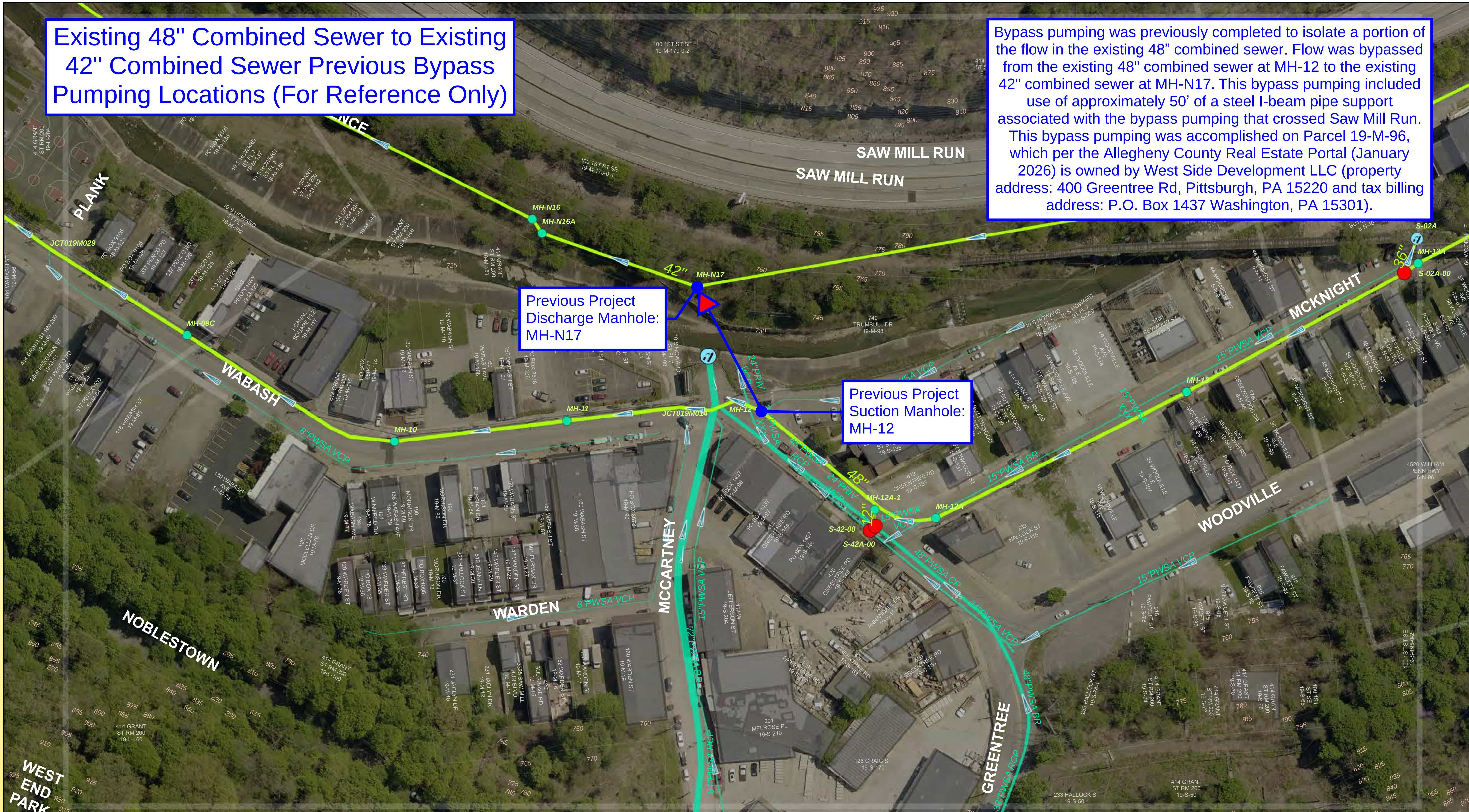
N

- Manhole
- Outfall
- Access Shaft
- Regulator
- ALCOSAN Sewer
- Municipal Sewer
- Parcel Boundary
- Edge of Pavement

Parcel owners' contact information should be obtained from the Allegheny County Real Estate Portal website.

Existing 48" Combined Sewer to Existing 42" Combined Sewer Previous Bypass Pumping Locations (For Reference Only)

Bypass pumping was previously completed to isolate a portion of the flow in the existing 48" combined sewer. Flow was bypassed from the existing 48" combined sewer at MH-12 to the existing 42" combined sewer at MH-N17. This bypass pumping included use of approximately 50' of a steel I-beam pipe support associated with the bypass pumping that crossed Saw Mill Run. This bypass pumping was accomplished on Parcel 19-M-96, which per the Allegheny County Real Estate Portal (January 2026) is owned by West Side Development LLC (property address: 400 Greentree Rd, Pittsburgh, PA 15220 and tax billing address: P.O. Box 1437 Washington, PA 15301).



ALCOSAN Shallow-Cut Interceptor **Saw Mill Run Blvd.** **Woodruff St to O-14**			
Date: 01/07/2026	Drawn By: MB	Page 5 of 7	

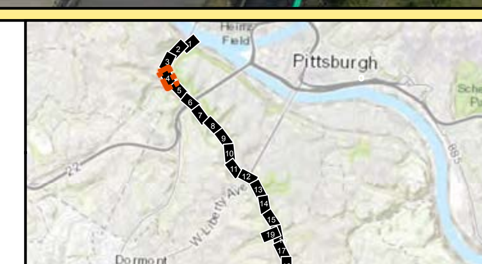
0 25 50 100 150 200 Feet

0 5 10 20 30 40 Meters

1 inch = 100 feet 1 Cm = 12 Meters

Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983False Easting: 1,968,500.0000

N



Legend:
- Manhole
- Outfall
- Access Shaft
- Regulator
- ALCOSAN Sewer
- Municipal Sewer
- Parcel Boundary
- Edge of Pavement

Parcel owners' contact information should be obtained from the Allegheny County Real Estate Portal website.

Map generated in ArcGIS 10.7.0 for general ALCOSAN reference use only. 03/19/2021 A.K.

Document Path: U:\RegConvey\GIS\2021\ArcMap\WorkingMaps\SawMillRun_11x17_03192021.mxd

Existing 48" Combined Sewer to Existing 42" Combined Sewer Previous Bypass Pumping Locations (For Reference Only)

Bypass pumping was previously completed to isolate a portion of the flow in the existing 48" combined sewer. Flow was bypassed from the existing 48" combined sewer at MH-S02 to the existing 42" combined sewer at MH-N07. This bypass pumping was accomplished on Parcel 6-A-172, which per the Allegheny County Real Estate Portal (January 2026) is owned by RCH Realty LP (property address: 150 E. Main Street, STE 201, Carnegie, PA 15106 and tax billing address: 150 E Main St STE 201, Carnegie, PA 15106-2437).

Previous Project Discharge Manhole: MH-N07

Previous Project Suction Manhole: MH-S02

SAW MILL RUN BLVD TO S MAIN ST

STEUBEN ST TO SAW MILL RUN BLVD

STEUBEN ST TO SAW MILL RUN BLVD

SAW MILL RUN

SAW MILL RUN

STEUBEN

STEUBEN

STEUBEN

MAIN

ELLIOTT

NEPTUNE

VIOLET

SANCTUS

MH 1A

MH N-4A

MH 1C

O-14Z-06

O-14Z-04

O-14Z-02

O-14Z

MH-04

MH-N06

MH-N07

MH-S02(ACOE)

MH-N08A

MH-03A

MH-S03(ACOE)

MH-N09A

MH-N12B

MH-07

MH-06A

MH-06

S-03A

S-46-00_PS

42"

48"

30"

48"

12"

18"PWSA VCP

14"PWSA VCP

15"PWSA VCP

8"

52"PWSA VCP

57"PWSA RCP

6"PWSA PVC

8"PWSA VCP

5"PWSA RCP

Not Assessed

ALCOSAN Shallow-Cut Interceptor

Saw Mill Run Blvd.
Woodruff St to O-14

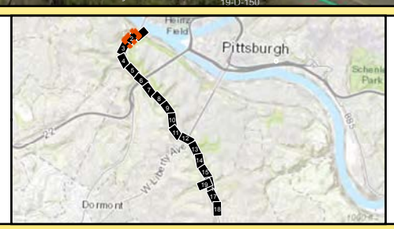
Date: 1/07/2026 | Drawn By: MB | Page 6 of 7

0 25 50 100 150 200 Feet

0 5 10 20 30 40 Meters

1 inch = 100 feet 1 Cm = 12 Meters

Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983False Easting: 1,968,500.0000



- Manhole
- Outfall
- Access Shaft
- Regulator
- ALCOSAN Sewer
- Municipal Sewer
- Parcel Boundary
- Edge of Pavement

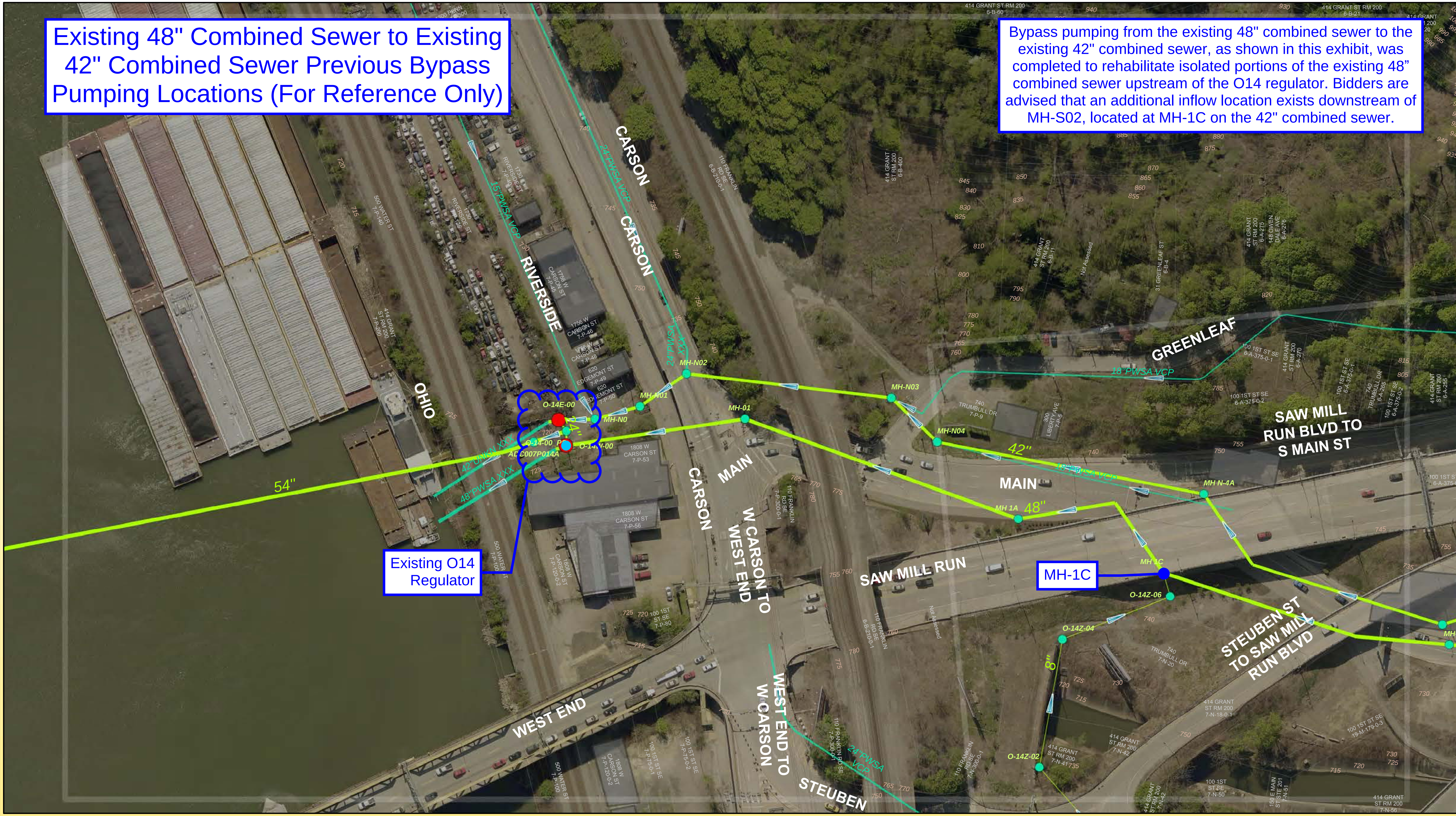
Parcel owners' contact information should be obtained from the Allegheny County Real Estate Portal website.

Map generated in ArcGIS 10.7.0, for general ALCOSAN reference use only. 09/19/2024 A.K.

Document Path: U:\RegConvey\GIS\2021\Arc\MapWorking\Maps\SawMillRun_11x17_09192024.mxd

Existing 48" Combined Sewer to Existing 42" Combined Sewer Previous Bypass Pumping Locations (For Reference Only)

Bypass pumping from the existing 48" combined sewer to the existing 42" combined sewer, as shown in this exhibit, was completed to rehabilitate isolated portions of the existing 48" combined sewer upstream of the O14 regulator. Bidders are advised that an additional inflow location exists downstream of MH-S02, located at MH-1C on the 42" combined sewer.



ALCOSAN Shallow-Cut Interceptor

Saw Mill Run Blvd.
Woodruff St to O-14

Date: 1/07/2026 | Drawn By: MB | Page 7 of 7

0 25 50 100 150 200 Feet
0 5 10 20 30 40 Meters
1 inch = 100 feet 1 Cm = 12 Meters

Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983False Easting: 1,968,500.0000

Manhole — ALCOSAN Sewer
Outfall — Municipal Sewer
Access Shaft — Parcel Boundary
Regulator — Edge of Pavement

Parcel owners' contact information should be obtained from the Allegheny County Real Estate Portal website.

Addendum No. 12

Attachment B

APPENDIX A – TECHNICAL SPECIFICATIONS

SECTION 01 45 23

- Attachment 3 – List of Structures in the Zone of Inspection Not Listed in Attachments 1 and 2 (12 pages)

OHIO RIVER TUNNEL (ORT) PROJECT ATTACHMENT 3 – LIST OF STRUCTURES IN THE ZONE OF INSPECTION NOT LISTED IN ATTACHMENTS 1 AND 2 [1,2,3]			
Structure Address or Name	**Adjacent Shafts and Tunnels in the Zone of Inspection [4]**	**Property Owner**	**Property Owner Contact Information [5]**
Chartiers Ave.	CCT-O07-AS	Borough of McKees Rocks	Borough of McKees Rocks Bobby Thompson codeenforcement@mckeesrockspa.us
W. Carson St.	CCT-O07-AS and CCT crossing	Borough of McKees Rocks	Borough of McKees Rocks Bobby Thompson codeenforcement@mckeesrockspa.us
River Rd.	CCT-O07-AS and CCT	Borough of McKees Rocks	Borough of McKees Rocks Bobby Thompson codeenforcement@mckeesrockspa.us
McKee Street	CCT-O07-AS	Borough of McKees Rocks	Borough of McKees Rocks Bobby Thompson codeenforcement@mckeesrockspa.us
112 -156 Chartiers Ave.	CCT-O07-AS	OLD TOWN PROPERTIES LP	OLD TOWN PROPERTIES LP 1 ATLANTIC AVE PITTSBURGH PA 15202-1714
108 McKees Rocks Plaza	CCT-O07-AS	ALCOSAN	Kim Kennedy ALCOSAN 3300 Preble Ave. Pittsburgh, PA 15233
West Carson St. Bridge, structures, and piers	CCT-O07-AS	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
W. Carson St.	CCT-O07-AS	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Shingiss St.	ORT-O06A-DS	Borough of McKees Rocks	Borough of McKees Rocks Bobby Thompson codeenforcement@mckeesrockspa.us
Robb St.	CCT-O06A-AD	Borough of McKees Rocks	Borough of McKees Rocks Bobby Thompson codeenforcement@mckeesrockspa.us
Catherine St.	CCT-O06A-AD	Borough of McKees Rocks	Borough of McKees Rocks Bobby Thompson codeenforcement@mckeesrockspa.us

OHIO RIVER TUNNEL (ORT) PROJECT ATTACHMENT 3 – LIST OF STRUCTURES IN THE ZONE OF INSPECTION NOT LISTED IN ATTACHMENTS 1 AND 2 [1,2,3]			
Structure Address or Name	**Adjacent Shafts and Tunnels in the Zone of Inspection [4]**	**Property Owner**	**Property Owner Contact Information [5]**
Sproull St.	CCT-O06A-AD	Borough of McKees Rocks	Borough of McKees Rocks Bobby Thompson codeenforcement@mckeesrockspa.us
Schoen St.	CCT-O06A-AD	Borough of McKees Rocks	Borough of McKees Rocks Bobby Thompson codeenforcement@mckeesrockspa.us
Campbell St.	CCT-O06A-AD	Borough of McKees Rocks	Borough of McKees Rocks Bobby Thompson codeenforcement@mckeesrockspa.us
Rocks St.	CCT-O06A-AD	Borough of McKees Rocks	Borough of McKees Rocks Bobby Thompson codeenforcement@mckeesrockspa.us
Ella St.	CCT-O06A-AD	Borough of McKees Rocks	Borough of McKees Rocks Bobby Thompson codeenforcement@mckeesrockspa.us
Eber St.	CCT-O06A-AD	Borough of McKees Rocks	Borough of McKees Rocks Bobby Thompson codeenforcement@mckeesrockspa.us
Gardner St.	ORT-O06A-DS	Borough of McKees Rocks	Borough of McKees Rocks Bobby Thompson codeenforcement@mckeesrockspa.us
Beaver Alley	ORT-O06A-DS	Borough of McKees Rocks	Borough of McKees Rocks Bobby Thompson codeenforcement@mckeesrockspa.us
Buscho Way	ORT-O06A-DS	Borough of McKees Rocks	Borough of McKees Rocks Bobby Thompson codeenforcement@mckeesrockspa.us
Robb St. Pump Station	CCT-O06A-AD	Borough of McKees Rocks	Borough of McKees Rocks Bobby Thompson codeenforcement@mckeesrockspa.us
Reed Building Supply 441 Robb St.	CCT-O06A-AD	A REED INVESTMENTS LLC	A REED INVESTMENTS LLC 441 ROBB ST MC KEES ROCKS PA 15136-2865

OHIO RIVER TUNNEL (ORT) PROJECT ATTACHMENT 3 – LIST OF STRUCTURES IN THE ZONE OF INSPECTION NOT LISTED IN ATTACHMENTS 1 AND 2 [1,2,3]			
Structure Address or Name	**Adjacent Shafts and Tunnels in the Zone of Inspection [4]**	**Property Owner**	**Property Owner Contact Information [5]**
Northern Sound & Light 11 Shingiss St.	CCT-O06A-AD	A REED INVESTMENTS LLC	A REED INVESTMENTS LLC 441 ROBB ST MC KEES ROCKS PA 15136-2865
17 Shingiss St	CCT-O06A-AD	MALESNICK EVA O	MALESNICK EVA O 17 SHINGISS ST MC KEES ROCKS PA 15136-2855
15 Shingiss St	CCT-O06A-AD	REED INVESTMENTS LLC	REED INVESTMENTS LLC 441 ROBB ST MC KEES ROCKS PA 15136-2855
5 Shingiss St.	CCT-O06A-AD	SEARIGHT RALPH & JOYCE (W)	SEARIGHT RALPH & JOYCE (W) 3536 CALIFORNIA AVE PITTSBURGH PA 15212
19 Shingiss St.	CCT-O06A-AD	NICOLO JUDITH	BOOKER MARIANNE SAVATT 19 SHINGISS ST MC KEES ROCKS PA 15136
Rangers Field 20 Sproul St.	CCT-O06A-AD	Borough of McKees Rocks	Bobby Thompson codeenforcement@mckeesrockspa.us BORO OF MC KEES ROCKS 340 BELL AVE MC KEES ROCKS PA 15136-3514
331 Catherine St.	CCT-O06A-AD	EVANS JOSEPHINE I	EVANS JOSEPHINE I 301 SHINGISS ST MC KEES ROCKS PA 15136-2737
325 Catherine St.	CCT-O06A-AD	BARTHOLOMEW RICHARD	BARTHOLOMEW RICHARD 325 CATHERINE ST MC KEES ROCKS PA 15136-2816
Engineered Polymer Solutions, Inc. 3125 Preble Ave.	ORT-O27-DS	ENGINEERED POLYMER SOLUTIONS INC	ENGINEERED POLYMER SOLUTIONS INC CLEVELAND OH 44101-1027

OHIO RIVER TUNNEL (ORT) PROJECT ATTACHMENT 3 – LIST OF STRUCTURES IN THE ZONE OF INSPECTION NOT LISTED IN ATTACHMENTS 1 AND 2 [1,2,3]			
Structure Address or Name	**Adjacent Shafts and Tunnels in the Zone of Inspection [4]**	**Property Owner**	**Property Owner Contact Information [5]**
Valspar 2001 Tracy St.	ORT-O27-DS	The Valspar Corporation	THE SHERWIN-WILLIAMS COMPANY DBA VALSPAR PAINTS CLEVELAND OH 44101
ALCOSAN WWTP buildings and structures, including electrical substation, electrical tower, monopole, river walls	ORT-O27-DS, Dewatering Tunnel	ALCOSAN	Kim Kennedy ALCOSAN 3300 Preble Ave. Pittsburgh, PA 15233
Tracy St.	Dewatering Tunnel	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Three Rivers Heritage Trail – multiple locations	ORT-O27-DS, Dewatering Tunnel, SMRT-O41-DS, SMRT, and ORT-A58-DS	Friends of the Riverfront	Kelsey Ripper 412-488-0212 kelsey@friendsoftheriverfront.org 100 Hafner Ave, Pittsburgh, PA 15223
Westhall St.	ORT-O27-DS, Dewatering Tunnel	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
North Point Dr.	SMRT-O41-DS, SMRT-O41-AD, SMRT, ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Belmont St.	SMRT-O41-DS, SMRT-O41-AD, SMRT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
State Route 19, West End Bridge, structures, piers, ramps	SMRT-O41-DS, SMRT-O41-AD, SMRT, ORT	PennDOT	PennDOT Division 11 Michael Simmons 412-429-4879 micsimmons@pa.gov Keith Cornelius 412-429-2855 kcornelius@pa.gov

OHIO RIVER TUNNEL (ORT) PROJECT ATTACHMENT 3 – LIST OF STRUCTURES IN THE ZONE OF INSPECTION NOT LISTED IN ATTACHMENTS 1 AND 2 [1,2,3]			
Structure Address or Name	**Adjacent Shafts and Tunnels in the Zone of Inspection [4]**	**Property Owner**	**Property Owner Contact Information [5]**
Concrete dock near end of Belmont St. at the riverside	SMRT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
AMO Industries	SMRT-O14-DS, SMRT	AMO Industries	AMO INDUSTRIES INC 1808 W CARSON ST PITTSBURGH PA 15219-1034
Concrete retaining wall near southwest end of S. Main St.	SMRT-O14-DS, SMRT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Existing concrete and stone walls and concrete structures	SMRT-O14-DS, SMRT	ALCOSAN	Kim Kennedy ALCOSAN 3300 Preble Ave. Pittsburgh, PA 15233
Campbell Transportation Barge dock and structures Northeast end of S. Main St.	SMRT-O14-DS, SMRT	Campbell Transportation	Campbell Transportation Jay Adamsky adamsky.j@barges.us Ronald Corigliano 724-746-9525 rcorigliano@barges.us
State Route 837, structures, piers, ramps	SMRT-O14-DS, SMRT	PennDOT	PennDOT Division 11 Michael Simmons 412-429-4879 micsimmons@pa.gov Keith Cornelius 412-429-2855 kcornelius@pa.gov
State Route 51, structures, piers, ramps	SMRT-O14-DS	PennDOT	PennDOT Division 11 Michael Simmons 412-429-4879 micsimmons@pa.gov Keith Cornelius 412-429-2855 kcornelius@pa.gov

OHIO RIVER TUNNEL (ORT) PROJECT ATTACHMENT 3 – LIST OF STRUCTURES IN THE ZONE OF INSPECTION NOT LISTED IN ATTACHMENTS 1 AND 2 [1,2,3]			
Structure Address or Name	**Adjacent Shafts and Tunnels in the Zone of Inspection [4]**	**Property Owner**	**Property Owner Contact Information [5]**
Riverside St.	SMRT-O14-DS, SMRT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
S. Main St.	SMRT-O14-DS	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Martindale St.	ORT-A48-DS, ORT-A48-AD	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Tetra Dr.	ORT-A48-DS, ORT-A48-AD	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Clark East Lot 477 Martindale St.	ORT-A48-DS, ORT-A48-AD	501 MARTINDALE ASSOCIATES LP	501 MARTINDALE ASSOCIATES LP 501 MARTINDALE ST PITTSBURGH PA 15212-5844
Allegheny Senior Living 401 W. Commons	ORT-A48-DS, ORT-A48-AD	FARMER'S MARKET HOUSING PARTNERSHIP	ALEX PAGARESKI 50 MONTGOMERY PL PITTSBURGH PA 15212
Merchant St.	ORT-A48-DS and ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Mazeroski Way	ORT-A48-DS	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Reedsdale Street	ORT-A48-DS and ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov

OHIO RIVER TUNNEL (ORT) PROJECT ATTACHMENT 3 – LIST OF STRUCTURES IN THE ZONE OF INSPECTION NOT LISTED IN ATTACHMENTS 1 AND 2 [1,2,3]			
Structure Address or Name	**Adjacent Shafts and Tunnels in the Zone of Inspection [4]**	**Property Owner**	**Property Owner Contact Information [5]**
E. Lacock St. – multiple locations	ORT-A48-DS, ORT-A58-DS, ORT-A58-AD, and ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
State Route 65, structures, piers, ramps	ORT-A48-DS and ORT	PennDOT	PennDOT Division 11 Michael Simmons 412-429-4879 micsimmons@pa.gov Keith Cornelius 412-429-2855 kcornelius@pa.gov
Voeghtly St.	ORT-A58-DS, ORT-A58-AD, ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
River Ave.	ORT-A58-DS	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Madison Ave.	ORT-A58-DS, ORT-A58-AD, ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Progress St.	ORT-A58-DS, ORT-A58-AD	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Hope St.	ORT-A58-DS	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Light of Life Outreach Center 720 E. Lacock St.	ORT-A58-DS, ORT-A58-AD	RIVERCOM ASSOCIATES LIMITED PARTNERSHIP	RIVERCOM ASSOCIATES LIMITED PARTNERSHIP 3555 WASHINGTON RD MCMURRAY PA 15317

OHIO RIVER TUNNEL (ORT) PROJECT ATTACHMENT 3 – LIST OF STRUCTURES IN THE ZONE OF INSPECTION NOT LISTED IN ATTACHMENTS 1 AND 2 [1,2,3]			
Structure Address or Name	**Adjacent Shafts and Tunnels in the Zone of Inspection [4]**	**Property Owner**	**Property Owner Contact Information [5]**
Light of Life Rescue Mission 234 Voeghtly St.	ORT-A58-DS, ORT-A58-AD	LIGHT OF LIFE SUPPORT CORPORATION	Jerrel Gilliam LIGHT OF LIFE SUPPORT CORPORATION 665 RIDGE AVE PITTSBURGH PA 15212-4721
810 River Ave.	ORT-A58-DS, ORT-A58-AD	810 RIVER AVENUE ASSOCIATES LLC	810 RIVER AVENUE ASSOCIATES LLC PENNSYLVANIA COMMERCIAL MGMT SERVICES 223 4TH AVE STE 150 PITTSBURGH PA 15222
700 &730 River Ave.	ORT-A58-DS	NORTH SIDE INDUSTRIAL DEVELOPMENT CO INC	NORTH SIDE INDUSTRIAL DEVELOPMENT CO INC 700 RIVER AVE STE 231 PITTSBURGH PA 15212-5907
I-579, structures, piers, ramps	ORT-A58-DS, ORT, and Dewatering Sewer	Federal Highway Administration	PennDOT Division 11 Michael Simmons 412-429-4879 micsimmons@pa.gov Keith Cornelius 412-429-2855 kcornelius@pa.gov
I-279, structures, piers, ramps	ORT-A58-DS, ORT-A58-AD, and ORT	Federal Highway Administration	PennDOT Division 11 Michael Simmons 412-429-4879 micsimmons@pa.gov Keith Cornelius 412-429-2855 kcornelius@pa.gov
State Route 28, structures, piers, ramps	ORT-A58-DS, ORT-A58-AD, and ORT	PennDOT	PennDOT Division 11 Michael Simmons 412-429-4879 micsimmons@pa.gov Keith Cornelius 412-429-2855 kcornelius@pa.gov

OHIO RIVER TUNNEL (ORT) PROJECT ATTACHMENT 3 – LIST OF STRUCTURES IN THE ZONE OF INSPECTION NOT LISTED IN ATTACHMENTS 1 AND 2 [1,2,3]			
Structure Address or Name	**Adjacent Shafts and Tunnels in the Zone of Inspection [4]**	**Property Owner**	**Property Owner Contact Information [5]**
George Warhola Scrap Metal	ORT-AS1-AS	WARHOLA GEORGE A	WARHOLA GEORGE A & MARIA BIAMONTE (W) 1601 SAINT ANDREWS DR OAKMONT PA 15139
Aj Warhola Recycling	ORT-AS1-AS	WARHOLA GEORGE A	WARHOLA GEORGE A & MARIA BIAMONTE (W) 1601 SAINT ANDREWS DR OAKMONT PA 15139
Progress St.	ORT-AS1-AS, AS1 LOC, ORT-A58-DS, and Dewatering Sewer	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Saw Mill Way	ORT-AS1-AS	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Carpenter Way	ORT-AS1-AS and AS1 LOC	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
S. Canal St.	ORT-AS1-AS and AS1 LOC	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Warfield St.	ORT-AS1-AS, AS1 LOC, and ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Chesbro St.	ORT-AS1-AS and AS1 LOC	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov

OHIO RIVER TUNNEL (ORT) PROJECT ATTACHMENT 3 – LIST OF STRUCTURES IN THE ZONE OF INSPECTION NOT LISTED IN ATTACHMENTS 1 AND 2 [1,2,3]			
Structure Address or Name	**Adjacent Shafts and Tunnels in the Zone of Inspection [4]**	**Property Owner**	**Property Owner Contact Information [5]**
Bolin Way	AS1 LOC	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Chestnut St.	AS1 LOC	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Norfolk Southern Railway and structures [6]	ORT crossing at LC-076.71	Norfolk Southern Railway	Timothy Harrison Norfolk Southern Timothy.Harrison@nscorp.com Christopher Cawley Norfolk Southern Christopher.Cawley2@nscorp.com
Norfolk Southern Railway, retaining wall, and structures [6]	ORT crossing at PC-01.17	Norfolk Southern Railway	Timothy Harrison Norfolk Southern Timothy.Harrison@nscorp.com Christopher Cawley Norfolk Southern Christopher.Cawley2@nscorp.com
Norfolk Southern Railway, retaining wall, and structures [6]	ORT-A48-AD crossing at PC-01.15	Norfolk Southern Railway	Timothy Harrison Norfolk Southern Timothy.Harrison@nscorp.com Christopher Cawley Norfolk Southern Christopher.Cawley2@nscorp.com
Norfolk Southern Railway, Bridge, and Piers [6]	ORT crossing at ML-01.79	Norfolk Southern Railway	Timothy Harrison Norfolk Southern Timothy.Harrison@nscorp.com Christopher Cawley Norfolk Southern Christopher.Cawley2@nscorp.com
CSX Railway [6]	CCT crossing at PLE-003.41, and CCT-O07-AS	CSX Transportation	Nick Jenkins CSXT 904-279-3837 Nicholas_Jenkins@csx.com

OHIO RIVER TUNNEL (ORT) PROJECT ATTACHMENT 3 – LIST OF STRUCTURES IN THE ZONE OF INSPECTION NOT LISTED IN ATTACHMENTS 1 AND 2 [1,2,3]			
Structure Address or Name	**Adjacent Shafts and Tunnels in the Zone of Inspection [4]**	**Property Owner**	**Property Owner Contact Information [5]**
CSX Railway [6]	SMRT crossing at PLE-001.32, and SMRT-O14-DS	CSX Transportation	Nick Jenkins CSXT 904-279-3837 Nicholas_Jenkins@csx.com
Pittsburgh & Ohio Central Railroad [6]	CCT Adit crossing at Milepost 1.1	Genesee & Wyoming	Jared Rishel jrishel@gwrr.com Greg Breaston greg.breaston@gwrr.com Jeremy Hammond jeremy.hammond@gwrr.com Donna Killingsworth donna.killingsworth@gwrr.com
Branchport Street	ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Seymour Street	ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Doerr Street	ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
N. Canal Street	ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Cedar Ave.	ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Stockton Street	ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov

OHIO RIVER TUNNEL (ORT) PROJECT ATTACHMENT 3 – LIST OF STRUCTURES IN THE ZONE OF INSPECTION NOT LISTED IN ATTACHMENTS 1 AND 2 [1,2,3]			
Structure Address or Name	**Adjacent Shafts and Tunnels in the Zone of Inspection [4]**	**Property Owner**	**Property Owner Contact Information [5]**
E. Commons	ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
S. Commons	ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Clifferty Street	ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Bank Street	ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Chenoa Street	ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov
Ridge Ave.	ORT	City of Pittsburgh	City of Pittsburgh DOMI Katie Wettick 412-737-7562 katie.wettick@pittsburghpa.gov

[1] Refer to Section 01 45 23, Parts 3.2 and 3.3. Attachment 3 may not be inclusive of all structures in the zone of inspection. Attachment 3 does not include any other areas identified by the Contractor expected to be disturbed by the Contractor's construction related operations.

[2] Contractor to verify structures in the zone of inspection.

[3] Assumes that ORT and CCT will be constructed via TBM.

[4] For ORT and CCT, refer to Section 01 32 13, Attachment 1.

[5] Source for residential and business parcels: Allegheny County Real Estate Portal (http://realestate.alleghenycounty.us), accessed in December 2025.

[6] Railroads are also listed in Section 01 45 23, Attachment 1 – List of Historic Structures.

Addendum No. 12

Attachment C

APPENDIX B - CONTRACT DRAWINGS

- Revised O27-ST-122 (Sheet 225 of 770)
- Revised A48-ST-306 (Sheet 367 of 770)
- Revised A58-ST-424 (Sheet 425 of 770)
- Revised O06A-ST-806 (Sheet 629 of 770)

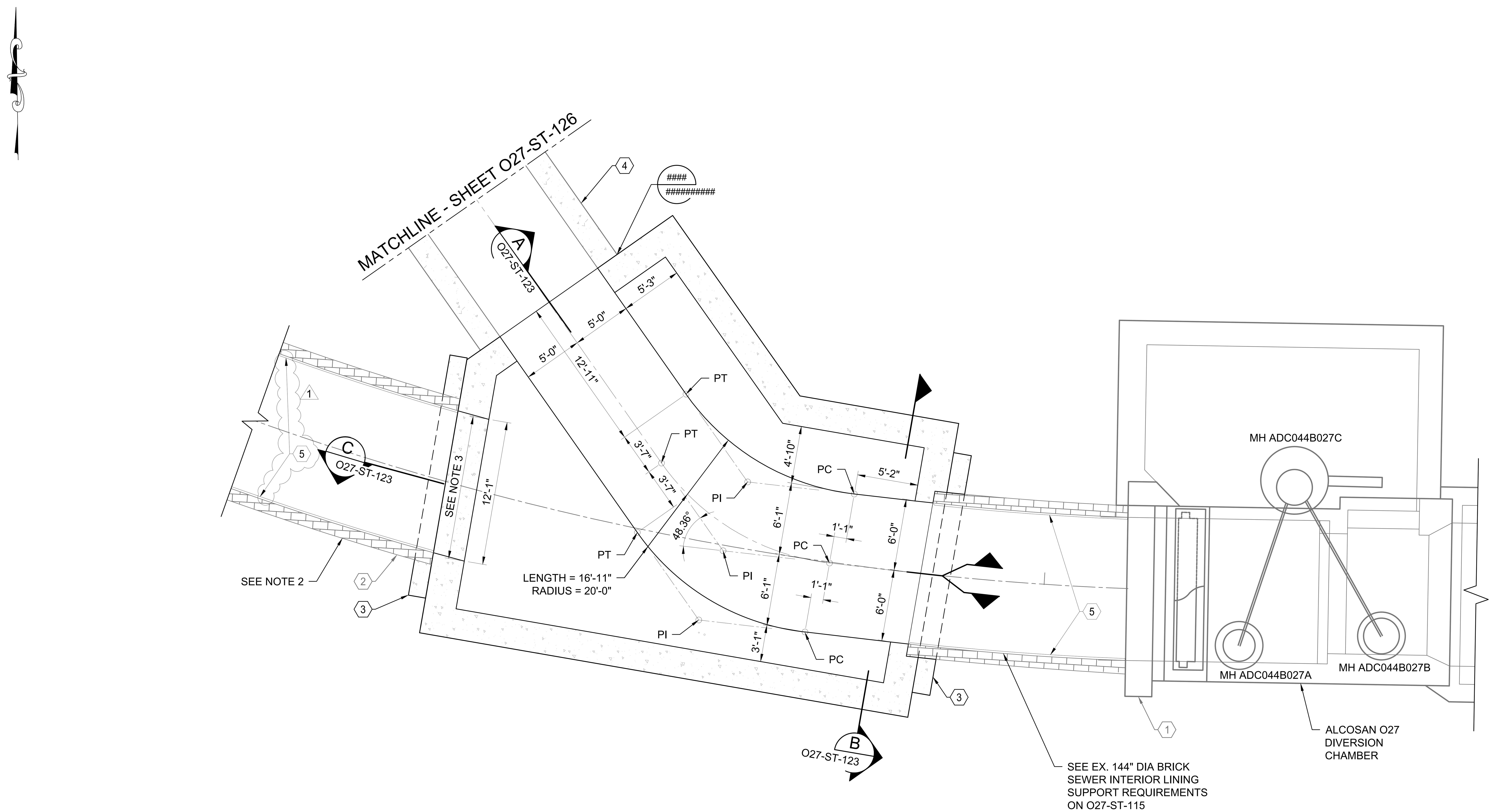
FILE NAME:C:\Users\PLE92466\DC\ACCDocs\Mott MacDonald\507105621 - ALCOSAN Ohio River Tunnel Design - T&M\Project Files\1 - ORT\05-Structural\Sheets - O27-ST-122 LAST SAVED BY: PLE92466 PLOT DATE:1/8/2026 10:50:56 AM

NOTES

1. SEE SHEET O27-ST-121 FOR NOTES RELATED TO THIS WORK.
2. TO BE ABANDONED - SEE CONSTRUCTION SEQUENCING SHEETS O27-ST-118 TO O27-ST-119.
3. FINAL CONFIGURATION SHOWN. SEE CONSTRUCTION SEQUENCING SHEETS O27-ST-118 TO O27-ST-119.

KEY NOTES:

1. EXISTING REGULATOR - SEE SHEET O27-CI-100
2. EXISTING 144" ID BRICK SEWER
3. CONCRETE COLLAR - SEE SOE SHEETS (NOTE 2 ON O27-ST-121)
4. ORT-O27-CS - SEE SHEET O27-ST-126
5. 2" THICK SHOTCRETE (SEE O27-ST-115 FOR REQUIREMENTS)



C/L FLOW CHANNEL PLAN AT EL. 703.32

SCALE IN FEET
SCALE: 3/16" = 1'-0"

Designed by:	REV No.	DATE	DESCRIPTION	APPV
AP/RNT	1	01/12/26	REVISION FOR ADDENDUM 12	ZC
Drawn by: JMS				
Checked by: PSK				

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alcosan allegheny county sanitary authority

ARLETTA SCOTT WILLIAMS
EXECUTIVE DIRECTOR, ALCOSAN
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PITTSBURGH, PA 15233
(412) 766 - 4810
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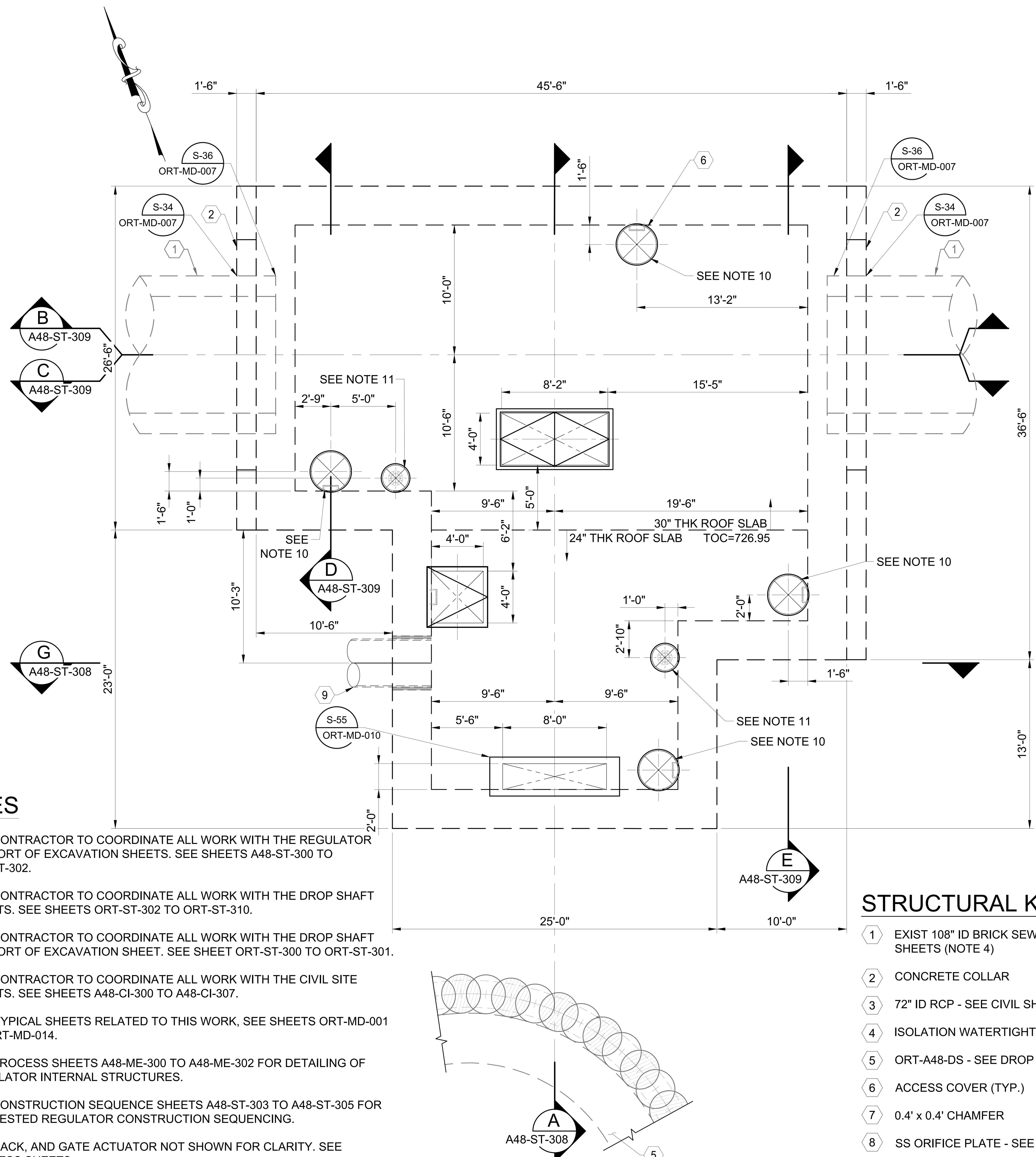
O27-ST-122
ORT-O27-MH PLANS
SHEET 2 OF 2

Contract: 1797
File: O27-ST-122.dwg
Date: 07/30/2025
Sheet: 225 OF 770



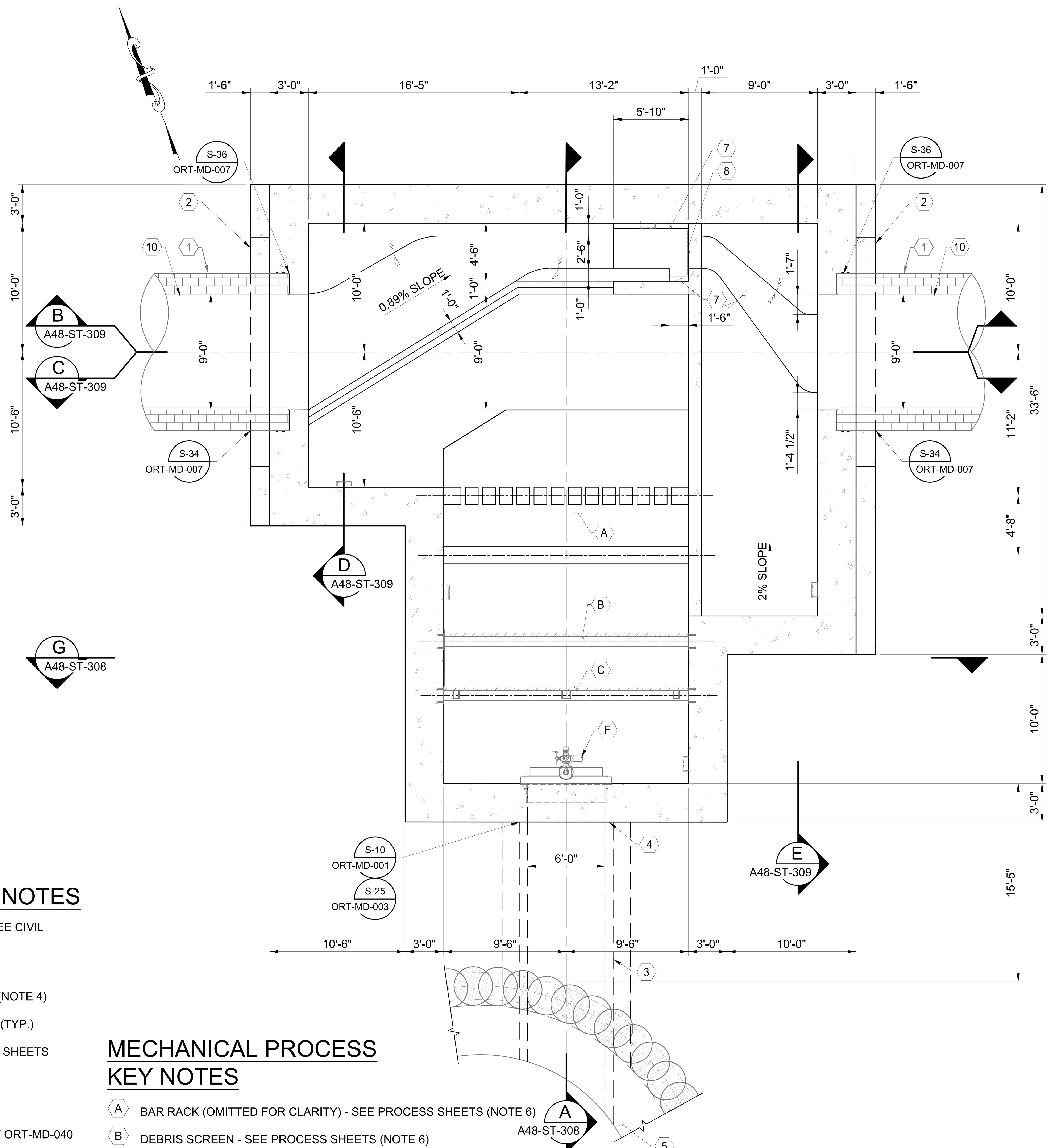
PLAN @ EL. 729.50 (GRADE LEVEL)

NOTES

1. THE CONTRACTOR TO COORDINATE ALL WORK WITH THE REGULATOR SUPPORT OF EXCAVATION SHEETS. SEE SHEETS A48-ST-300 TO A48-ST-302.
2. THE CONTRACTOR TO COORDINATE ALL WORK WITH THE DROP SHAFT SHEETS. SEE SHEETS ORT-ST-302 TO ORT-ST-310.
3. THE CONTRACTOR TO COORDINATE ALL WORK WITH THE DROP SHAFT SUPPORT OF EXCAVATION SHEET. SEE SHEET ORT-ST-300 TO ORT-ST-301.
4. THE CONTRACTOR TO COORDINATE ALL WORK WITH THE CIVIL SITE SHEETS. SEE SHEETS A48-CI-300 TO A48-CI-307.
5. FOR TYPICAL SHEETS RELATED TO THIS WORK, SEE SHEETS ORT-MD-001 TO ORT-MD-014.
6. SEE PROCESS SHEETS A48-ME-300 TO A48-ME-302 FOR DETAILING OF REGULATOR INTERNAL STRUCTURES.
7. SEE CONSTRUCTION SEQUENCE SHEETS A48-ST-303 TO A48-ST-305 FOR SUGGESTED REGULATOR CONSTRUCTION SEQUENCING.
8. BAR RACK, AND GATE ACTUATOR NOT SHOWN FOR CLARITY. SEE PROCESS SHEETS.
9. NO REGULATOR SOE IS SHOWN IN THIS SHEET FOR CLARITY. SEE SOE SHEETS.
10. 3'-0" DIAMETER OPENING IN ROOF SLAB (TYP).
11. 2'-0" DIAMETER OPENING IN ROOF SLAB (TYP).

STRUCTURAL KEY NOTES

1. EXIST 108" ID BRICK SEWER - SEE CIVIL SHEETS (NOTE 4)
2. CONCRETE COLLAR
3. 72" ID RCP - SEE CIVIL SHEETS (NOTE 4)
4. ISOLATION WATERTIGHT JOINT (TYP.)
5. ORT-A48-DS - SEE DROP SHAFT SHEETS
6. ACCESS COVER (TYP.)
7. 0.4' x 0.4' CHAMFER
8. SS ORIFICE PLATE - SEE SHEET ORT-MD-040
9. 42" ID DI RG VENT PIPE, SEE CIVIL SHEETS
10. 2" THICK SHOTCRETE (SEE A48-ST-300 FOR REQUIREMENTS)



MECHANICAL PROCESS KEY NOTES

A. BAR RACK (OMITTED FOR CLARITY) - SEE PROCESS SHEETS (NOTE 6)
B. DEBRIS SCREEN - SEE PROCESS SHEETS (NOTE 6)
C. WEDGE WIRE SCREEN - SEE PROCESS SHEETS (NOTE 6)
F. SLIDE GATE - SEE PROCESS SHEETS (NOTE 6)

PLAN @ EL. 716.98

4 0 4 8
SCALE IN FEET
SCALE: 3/16" = 1'-0"

Designed by: ARY/RNT	REVISION			
	REV No.	DATE	DESCRIPTION	APPV
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ALLEGHENY COUNTY SANITARY AUTHORITY (ALCOSAN)
OHIO RIVER TUNNEL (ORT)

A48-ST-306
ORT-A48-RG PLANS
SHEET 1 OF 2

Contract: 1797
File: A48-ST-306.dwg
Date: 07/30/2025
Sheet: 367 OF 770

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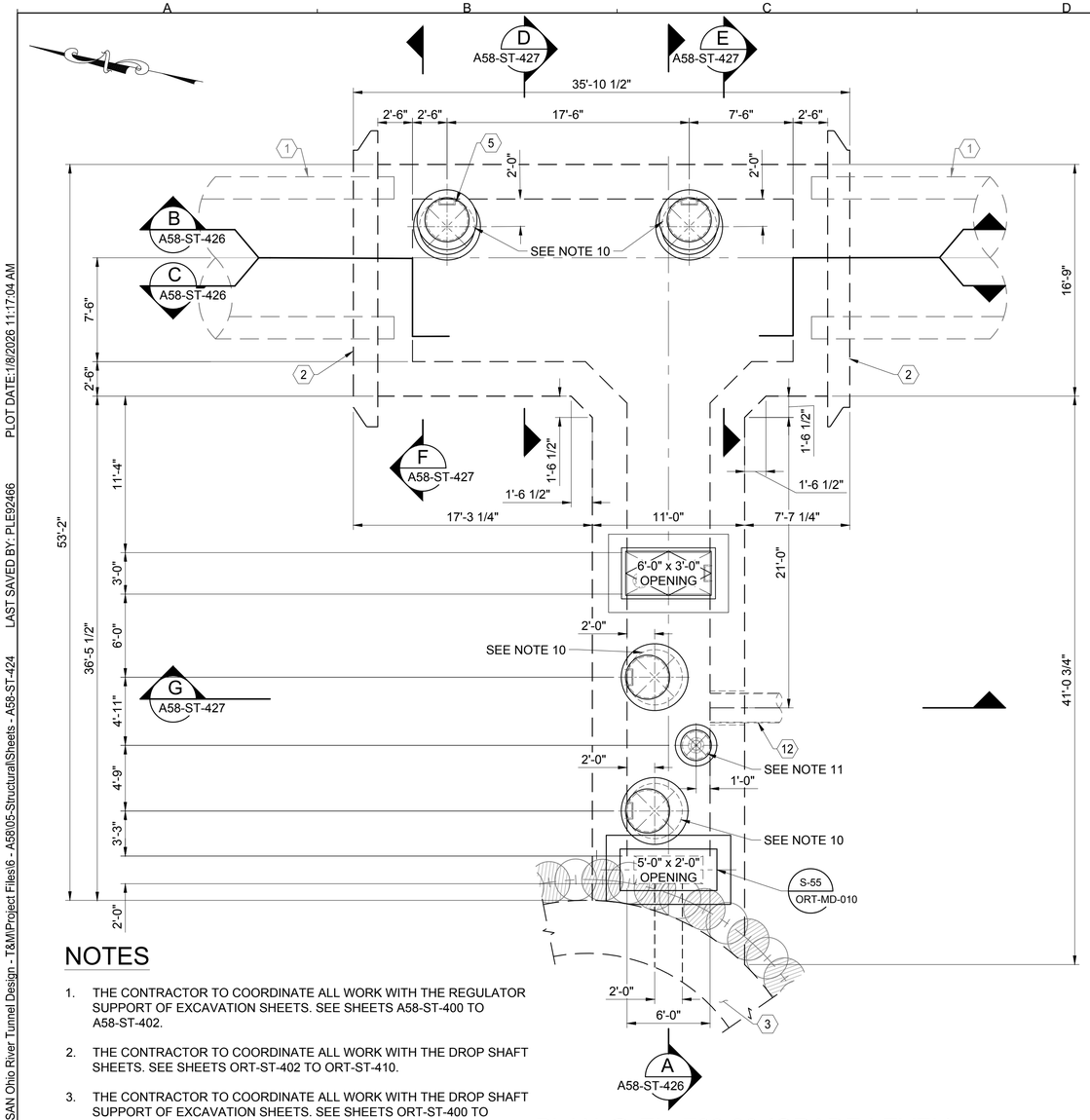

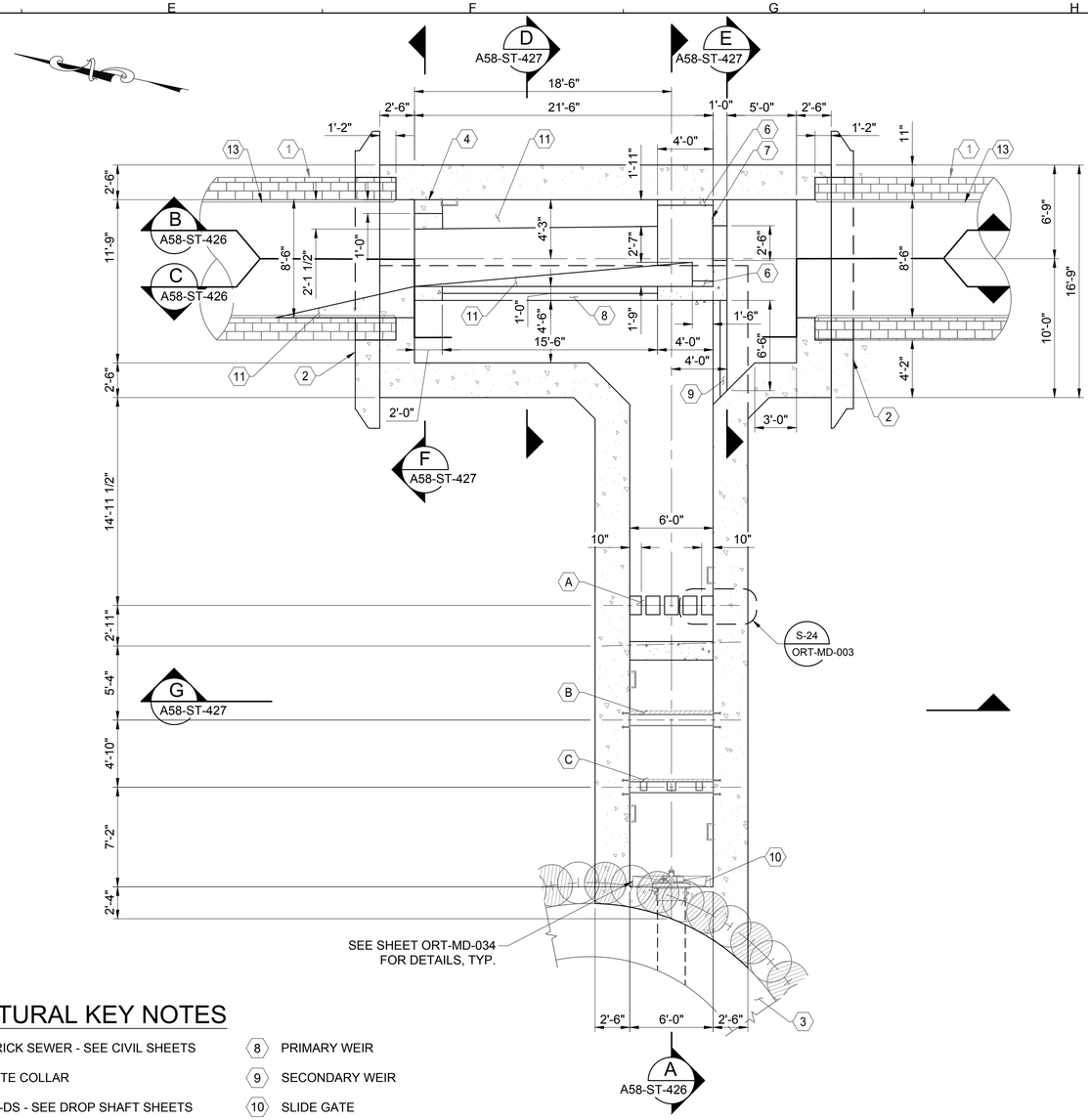

NOTES

1. THE CONTRACTOR TO COORDINATE ALL WORK WITH THE REGULATOR SUPPORT OF EXCAVATION SHEETS. SEE SHEETS A58-ST-400 TO A58-ST-402.
2. THE CONTRACTOR TO COORDINATE ALL WORK WITH THE DROP SHAFT SHEETS. SEE SHEETS ORT-ST-402 TO ORT-ST-410.
3. THE CONTRACTOR TO COORDINATE ALL WORK WITH THE DROP SHAFT SUPPORT OF EXCAVATION SHEETS. SEE SHEETS ORT-ST-400 TO ORT-ST-401.
4. THE CONTRACTOR TO COORDINATE ALL WORK WITH THE CIVIL SITE SHEETS. SEE SHEETS A58-CI-400 TO A58-CI-414.
5. FOR TYPICAL SHEETS RELATED TO THIS WORK, SEE SHEETS ORT-MD-001 TO ORT-MD-014.
6. SEE PROCESS SHEETS A58-ME-400 TO A58-ME-406 FOR DETAILING OF REGULATOR INTERNAL FRAMING AND STRUCTURES.
7. SEE CONSTRUCTION SEQUENCE SHEETS A58-ST-406 TO A58-ST-408 FOR SUGGESTED REGULATOR CONSTRUCTION SEQUENCING.
8. PLATFORM, BAR RACK, AND GATE ACTUATOR NOT SHOWN FOR CLARITY. SEE PROCESS SHEETS.

PLAN @ EL. 723.00 (GRADE LEVEL)

NOTES (CONT'D)

9. NOT ALL SOE SHOWN FOR CLARITY. SEE SOE SHEETS.
10. 4'-0" DIAMETER OPENING IN ROOF SLAB (TYP).
11. 2'-0" DIAMETER OPENING IN ROOF SLAB (TYP).

STRUCTURAL KEY NOTES

1. EXIST BRICK SEWER - SEE CIVIL SHEETS
2. CONCRETE COLLAR
3. ORT-A58-DS - SEE DROP SHAFT SHEETS
4. INLET TRANSITION BENCHING (TOC EL. 705.31)
5. ACCESS COVER (TYP.)
6. 0.4' X 0.4' CHAMFER
7. SS ORIFICE PLATE - SEE SHEET ORT-MD-040
8. PRIMARY WEIR
9. SECONDARY WEIR
10. SLIDE GATE
11. BENCHING
12. 24" ID DI VENT PIPE - SEE CIVIL SHEETS
13. 2" THICK SHOTCRETE (SEE A58-ST-400 FOR REQUIREMENTS) (1)

PLAN @ EL. 708.00

MECHANICAL PROCESS KEY NOTES

- A. BAR RACK (OMITTED FOR CLARITY) - SEE PROCESS SHEETS (NOTE 6)
- B. DEBRIS SCREEN - SEE PROCESS SHEETS (NOTE 6)
- C. WEDGE WIRE SCREEN - SEE PROCESS SHEETS (NOTE 6)

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SCALE IN FEET
SCALE: 3/16" = 1'-0"

Designed by:	REVISION			
ARY/RNT	REV No.	DATE	DESCRIPTION	APPV
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JMS				
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A58-ST-424
ORT-A58-RG1 PLANS
SHEET 1 OF 2

Contract: 1797
File: A58-ST-424.dwg
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Sheet: 425 OF 770

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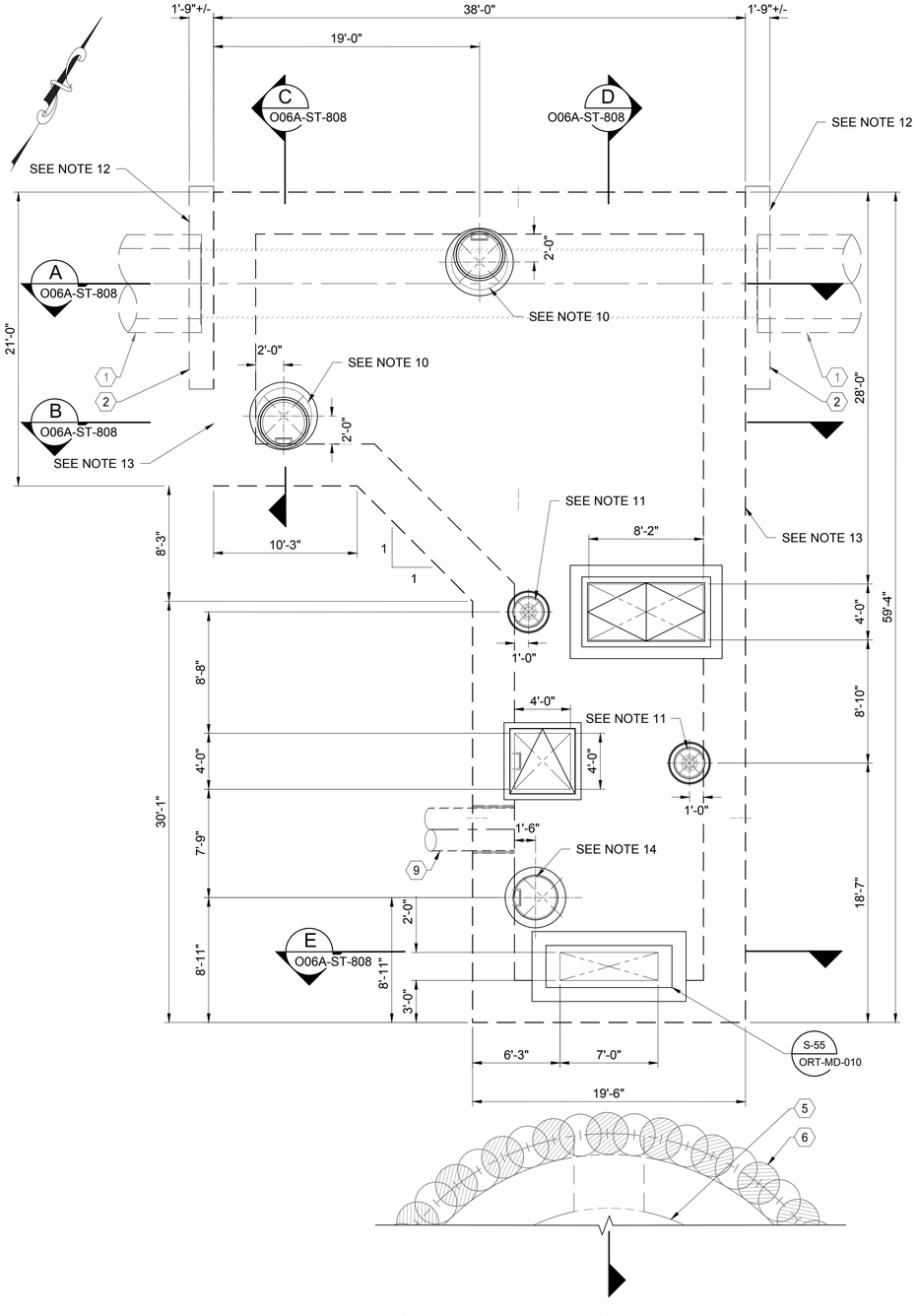

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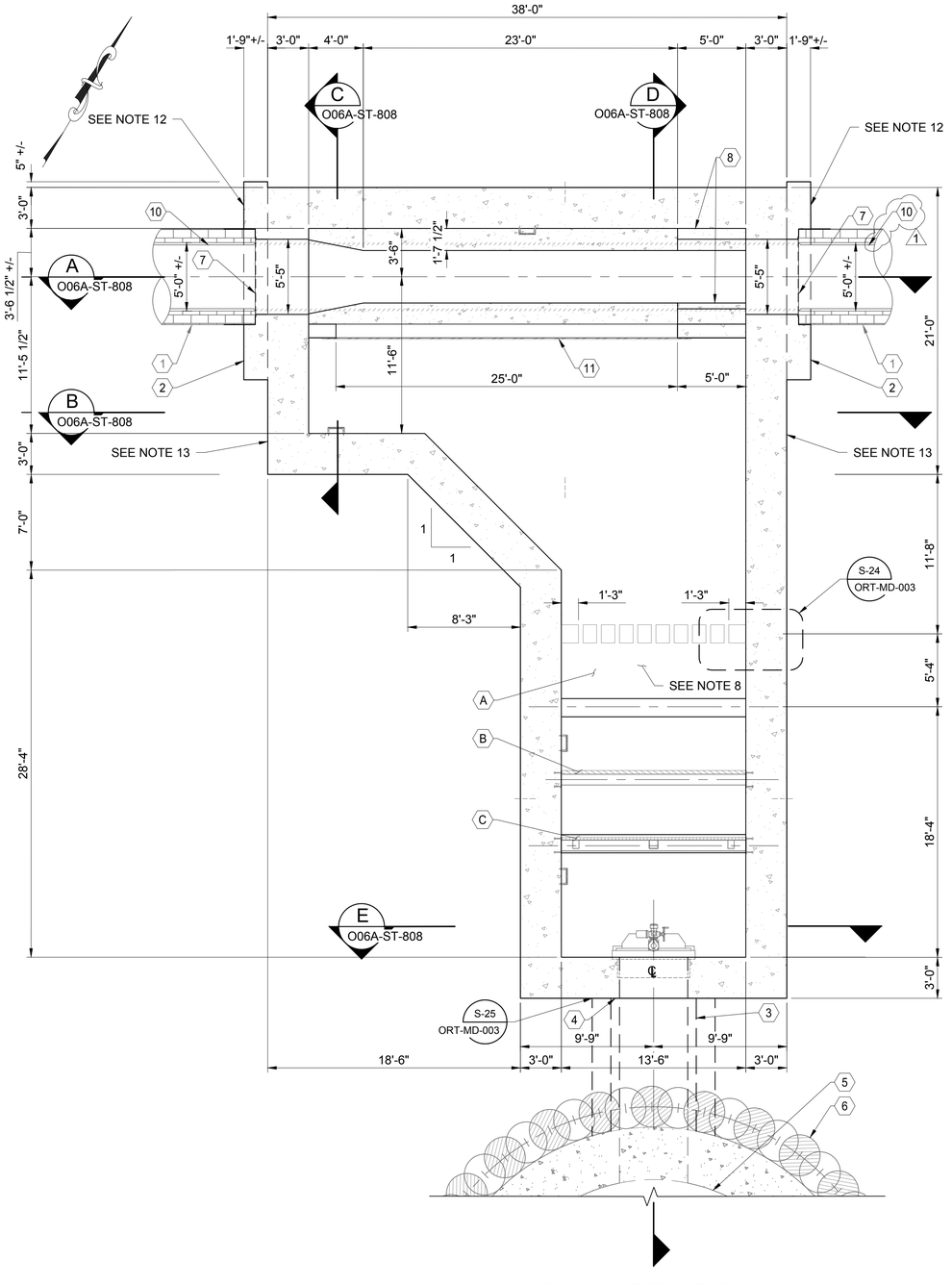

PLAN AT EL. 706.49

NOTES

1. THE CONTRACTOR TO COORDINATE ALL WORK WITH THE REGULATOR SUPPORT OF EXCAVATION SHEETS. SEE SHEETS O06A-ST-800 TO O06A-ST-802.
2. THE CONTRACTOR TO COORDINATE ALL WORK WITH THE DROP SHAFT SHEETS. SEE SHEETS ORT-ST-800 TO ORT-ST-810.
3. THE CONTRACTOR TO COORDINATE ALL WORK WITH THE DROP SHAFT SUPPORT OF EXCAVATION SHEETS. SEE SHEETS ORT-ST-800 AND O06A-CI-805.
4. THE CONTRACTOR TO COORDINATE ALL WORK WITH THE CIVIL SITE SHEETS. SEE SHEETS O06A-CI-800 TO O06A-CI-813.
5. FOR TYPICAL DETAILS RELATED TO THIS WORK, SEE SHEETS ORT-MD-001 TO ORT-MD-014.
6. SEE PROCESS SHEETS O06A-ME-800 TO O06A-ME-802 FOR DETAILING OF REGULATOR INTERNAL FRAMING AND STRUCTURES.
7. SEE CONSTRUCTION SEQUENCE SHEETS O06A-ST-803 TO O06A-ST-805 FOR SUGGESTED REGULATOR CONSTRUCTION SEQUENCING.
8. PLATFORM, BAR RACK, AND GATE ACTUATOR NOT SHOWN FOR CLARITY. SEE PROCESS SHEETS.
9. NO REGULATOR SOE IS SHOWN FOR CLARITY. SEE SOE SHEETS.
10. 4'-0" DIAMETER OPENING IN ROOF SLAB (TYP).
11. 2'-0" DIAMETER OPENING IN ROOF SLAB (TYP).
12. RC COLLAR - SEE SOE SHEETS.
13. EXTERIOR FACE OF WALL FOR LIMITS OF REINFORCEMENT.
14. 3'-0" DIAMETER OPENING IN ROOF SLAB (TYP).

STRUCTURAL KEY NOTES

1. EXIST BRICK SEWER - SEE CIVIL SHEETS (NOTE 4)
2. CONCRETE COLLAR - SEE SOE SHEETS (NOTE 1)
3. RCP - CLASS V - WALL C - SEE CIVIL SHEETS (NOTE 4)
4. ISOLATION WATERTIGHT JOINT - SEE TYPICAL DETAILS (NOTE 5)
5. CCT-O06A-AS
6. CCT-O06A-AS SOE - SEE SOE SHEETS (NOTE 3)
7. FLUME PIPE - SEE CONSTRUCTION SEQUENCING SHEETS (NOTE 7)
8. INLET TRANSITION BENCHING
9. 36" ID DI RG VENT PIPE, SEE CIVIL SHEETS (NOTE 4)
10. 2" THICK SHOTCRETE (SEE O06A-ST-800 FOR REQUIREMENTS)
11. WEIR PLATE

MECHANICAL PROCESS KEY NOTES

- A. BAR RACK - SEE PROCESS SHEETS (NOTE 6)
- B. DEBRIS SCREEN - SEE PROCESS SHEETS (NOTE 6)
- C. WEDGE WIRE SCREEN - SEE PROCESS SHEETS (NOTE 6)

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SCALE IN FEET
SCALE: 3/16" = 1'-0"

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Designed by:	REVISION			
AP/RNT	REV No.	DATE	DESCRIPTION	APPV
Drawn by:	1	01/12/26	REVISION FOR ADDENDUM 12	ZC
JMS				
Checked by:				
PSK				

MOTT MACDONALD
Two Allegheny Center
Nova Tower 2, Suite 1301
Pittsburgh, PA 15212
(412) 497 - 2900

811 Dial 8-1-1 or 1-800-242-1776 not less than 3 business days nor more than 10 business days prior to the start of excavation.
Pennsylvania One Call System Serial Number
FINAL DESIGN TICKET # 20250040203

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL ENGINEER — PRZEMYSLAW STEFAN OBIALA — NO. 068314

ARLETTA SCOTT WILLIAMS
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ALLEGHENY COUNTY SANITARY AUTHORITY (ALCOSAN)
OHIO RIVER TUNNEL (ORT)

O06A-ST-806
CCT-O06A-RG PLANS
SHEET 1 OF 2

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Addendum No. 12

Attachment D

APPENDIX A – TECHNICAL SPECIFICATIONS

SECTION 03 30 00

- Revised Section 03 30 00 (39 pages)

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. The Work specified in this Section consists of designing and furnishing all materials, labor, equipment, formwork, falsework and shoring, inspection, and testing for the production and installation of cast-in-place concrete as indicated on the Contract Drawings, specified herein and needed for a complete installation.

B. Precast concrete is not included in this Section.

1.2 DEFINITIONS

A. Mass Concrete: Any volume of concrete in which a combination of dimensions of the member being cast, the boundary conditions, the characteristics of the concrete mixture, and the ambient conditions can lead to undesirable thermal stress cracking, deleterious chemical reactions, or reduction in the long-term strength as a result of elevated concrete temperature due to heat from hydration. All permanent concrete elements with a thickness of 48 inches or greater, and any other pour deemed by the Owner to be at risk for thermal-related distress shall be considered mass concrete.

B. Defective Areas: Surface defects that include honeycomb, rock pockets, indentations, cracks 0.005 inch wide and larger, and cracks that leak in water-holding structures, spalls, chips, air bubbles, pinholes, bug holes, embedded debris, lift lines, sand lines, bleed lines, leakage from form joints, fins and other projections, form popouts, texture irregularities, and stains and other color variations that cannot be removed by cleaning.

C. New Concrete: Less than 60 days old.

D. Point of Delivery: The final location where the concrete delivery truck discharges fresh concrete at the structural element site to be further conveyed or discharged to Point of Placement.

E. Point of Placement: The final location where concrete is being delivered into place such as formwork or support of excavation walls to form the structural element.

F. Pump Discharge: The discharge end of the pump hose at or immediate to Point of Placement.

1.3 RELATED DOCUMENTS

A. Related Sections:
   1. Section 01 31 19 – Project Meetings.
   2. Section 01 45 00 – Quality Requirements.
   3. Section 01 45 33 – Special Inspections and Testing Program.
   4. Section 03 10 00 – Concrete Forming and Accessories.
   5. Section 03 20 00 – Concrete Reinforcing.
   6. Section 03 25 00 – Concrete Joints and Accessories.
   7. Section 03 35 00 – Concrete Finishing.
   8. Section 03 39 00 – Concrete Curing.
   9. Section 03 60 00 – Grouting.

B. Reference Standards: The publications listed below form a part of this Specification.
   1. For all listed standards and codes, use the most current version.
   2. American Concrete Institute (ACI):
      a. ACI PRC-211.1 – Selecting Proportions for Normal-Density and High-Density Concrete – Guide.
      b. ACI 201.2 – Durable Concrete Guide.
      c. ACI PRC-207.1 – Mass Concrete Guide.
      d. ACI 207.2R – Report on Thermal and Volume Change Effects on Cracking of Mass Concrete.
      e. ACI 207.4R – Report on Cooling and Insulating Systems for Mass Concrete.
      f. ACI 301 – Specifications for Concrete Construction.
      g. ACI 302 – Guide for Concrete Floor and Slab Construction.
      h. ACI 304R – Guide for Measuring, Mixing, Transporting, and Placing Concrete.
      i. ACI 305R – Guide to Hot Weather Concreting.
      j. ACI 306R – Guide to Cold Weather Concreting.
      k. ACI 309R – Guide for Consolidation of Concrete.
      l. ACI 318 – Building Code Requirements for Structural Concrete.
      m. ACI 350R – Code Requirements for Environmental Engineering Concrete Structures.
      n. SP-15 – Field Reference Manual.
   3. ASTM International (ASTM):
      a. ASTM C31 – Standard Practice for Making and Curing Concrete Test Specimens in the Field.
      b. ASTM C33 – Standard Specification for Concrete Aggregates.
      c. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
      d. ASTM C42 – Standard Test Methods for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
      e. ASTM C88 – Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
      f. ASTM C94 – Standard Specification for Ready-Mixed Concrete.

g. ASTM C138 – Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
h. ASTM C143 – Standard Test Method for Slump of Hydraulic-Concrete.
i. ASTM C150 – Standard Specification for Portland Cement.
j. ASTM C157 – Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete.
k. ASTM C172 – Standard Practice for Sampling Freshly Mixed Concrete.
l. ASTM C192 – Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.
m. ASTM C231 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
n. ASTM C260 – Standard Specification for Air-Entraining Admixtures for Concrete.
o. ASTM C295 – Standard Guide for Petrographic Examination of Aggregates for Concrete.
p. ASTM C311 – Standard Test Methods for Sampling and Testing Coal Ash or Natural Pozzolans for Use in Concrete.
q. ASTM C452 – Standard Test Method for Potential Expansion of Portland-Cement Mortars Exposed to Sulfate.
r. ASTM C457 – Standard Test Method for Microscopical Determination of Parameters of the Air-Void System in Hardened Concrete.
s. ASTM C494 – Standard Specification for Chemical Admixtures for Concrete.
t. ASTM C595 – Standard Specification for Blended Hydraulic Cements.
u. ASTM C618 – Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
v. ASTM C989 – Standard Specification for Slag Cement for Use in Concrete and Mortars.
w. ASTM C1012 – Standard Test Method for Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution.
x. ASTM C1056 – Standard Practice for Preparation of Loose Fill Mineral Fiber Thermal Insulation Samples for Testing.
y. ASTM C1702 – Standard Test Method for Measurement of Heat of Hydration of Hydraulic Cementitious Materials Using Isothermal Conduction Calorimetry.
z. ASTM C1260 - Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method).
aa. ~~ASTM D1056 – Standard Specification for Flexible Cellular Materials – Sponge or Expanded Rubber~~ ASTM D1140 - Standard Test Methods for Determining the Amount of Material Finer than 75-µm (No. 200) Sieve in Soils by Washing.
bb. ASTM E329 – Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

4. National Bureau of Standards: Handbook No. 44, Specifications, Tolerances, and Other Technical Requirements for Commercial Weighing and Measuring Devices.

1.4 QUALITY ASSURANCE AND QUALITY CONTROL

A. Pre-installation Meetings:
   1. Required Meeting Attendees:
      a. Contractor.
      b. Ready-mix producer (if requested by the Owner).
      c. Admixture representative (if requested by the Owner).
      d. Testing personnel.
      e. Owner.
   2. Schedule and conduct prior to incorporation of respective products into Project. The Contractor shall coordinate the pre-installation meeting location/date/time a minimum of seven calendar days in advance of the desired meeting date with the Owner.
   3. Agenda shall include:
      a. Admixture types, dosage, performance, and redosing at site.
      b. Mix designs, test of mixes, and submittals.
      c. Placement methods, techniques, equipment, consolidation, and form pressures.
      d. Slump and placement time to maintain slump.
      e. Finish, curing, and water retention.
      f. Other specified requirements requiring coordination.
   4. Conference minutes as specified in Section 01 31 19 – Project Meetings.

B. Approval of Thermal Control Plan:
   1. Do not place any mass pour concrete until Thermal Control Plan is approved by the Owner. Approval is required at least 30 days before placing any production concrete.
   2. Meetings:
      a. Meetings shall be scheduled and conducted prior to mass concrete pours. Notify Owner of location and time.
      b. Required Meeting Attendees:
         1) Contractor, including Thermal Control Engineer, and pumping, placing, finishing, and curing subcontractors.
         2) Inspection, testing, sampling, and thermal monitoring personnel.
         3) Designer’s representative.
         4) Owner.
      c. Agenda shall include:
         1) Thermal Control Plan.
         2) Monitoring.
         3) Testing Methods.

4) Placement methods, techniques, equipment, consolidation, and monitoring.
5) Finishing and curing.
6) Protection procedures for weather conditions.
7) Other specified requirements requiring coordination.

3. Tolerances for Thermal Control in Concrete:
   a. Maximum temperature after placement shall not exceed 160 degrees F.
   b. Maximum temperature difference between any two points within the concrete placement shall not exceed 35 degrees F.
4. Cold Weather Placement:
   a. Do not place concrete when ambient temperature is below 40 degrees F or approaching 40 degrees F and falling, without special protection as specified in ACI 306R or approved by the Owner.
   b. Do not place concrete against frozen earth or ice, or against forms and reinforcement with frost or ice present.
   c. Provide heated enclosures when air temperatures are below 40 degrees F.

~~C. Mockup Panel:~~
~~1. The Contractor shall produce a mockup wall panel for each approved mix and each finish for approval by the Owner.~~
~~2. Wall mockup panel shall be of sufficient size to replicate formwork, placement procedures, and quality of finish. Panel shall be no less than 2 feet wide by 4 feet high and 8 inches thick. Mockup panel shall contain reinforcement.~~
~~3. Concrete patching, such as for form tie holes, shall be applied to the wall mockup for approval.~~
~~4. For concrete mixes that incorporate Type 1L cement, the Contractor shall produce a slab mockup for each approved mix.~~
~~5. Minimum slab dimensions shall be 12 feet by 12 feet by 3 feet.~~
~~6. Placement procedures, finishing equipment, and curing shall be identical to those that will be used on final production slabs. Changes in procedures, etc. may require additional slabs to be produced.~~
~~7. Mockup may be used for acceptance and rejection of concrete finishes. It is critical that the mockups match the actual anticipated finishes. A different finish may be applied to each side of the mockup panel.~~
~~8. Mockup panels shall remain onsite for the duration of the project or until final acceptance of all concrete placements related to associated mix. Owner shall be notified for agreement prior to panel demolition.~~
~~9. Mockup panels and slabs that fail to meet acceptable quality shall be reconstructed with procedures being adjusted until panels/slabs are accepted.~~

1.5 QUALIFICATIONS – NOT USED

1.6 SUBMITTALS

A. Administrative Submittals:
   1. Pre-concrete coordination meeting schedule.
   2. Preinstallation conference minutes.

B. Mix Designs:
   1. Design Data: Complete concrete mix designs performed and signed by qualified mix designer and approved by Professional Engineer licensed in the Commonwealth of Pennsylvania.
   ~~2. Concrete mixes used on this Project shall be either established mixes verified by "Field Test Data," or new custom laboratory designed "Trial Mix."~~
   ~~3.~~2. Strength Test Reports:
      a. For a laboratory Trial Mix, the design mix shall contain the actual materials to be used in the final job mix, slump shall be within ~~0.75~~1.0 inches of the maximum allowable slump, and air content shall be within 0.5 percent of the maximum allowable air content.
      b. For a mix based on established Field Test Data, provide backup and calculations to adjust f_{cr} based on standard deviation per ACI 301. Quantity and age of data shall be in accordance with ACI 301.
   3. The design mix submittal shall include, but is not limited to the following:
      a. Names of all Suppliers and/or Manufacturers.
      b. Distance, in miles, from the Concrete Plant to the Job Site.
      c. Certification of compliance with applicable ASTM Specifications for all materials.
      d. Proposed proportioning of materials required for each design mix submitted for the various concrete classes and required concrete strengths, w/c ratios, and aggregate sizes specified in Part 2.1.
      e. Proposed/required admixtures and dosage of each for all temperature ranges.
      f. Sieve analyses for each aggregate size.
      g. Compressive strength test results and strength curves.
      h. Signed statement that the proposed proportions meet all of the Specification requirements, including average compressive strength consisting of either field strength test record or laboratory trial mixtures. All documentation submitted shall conform to the requirements of ACI 318, Chapter 5.

C. Product Data. Admixtures, bonding agent, coating, patching materials and other materials related to concrete. All data shall be dated within the last year or the most recent product data available. Partial submittals will not be reviewed.
   1. Provide catalog cuts and state quantity and source of mix ingredients:
      a. Cement
      b. Pozzolans
      c. Fine aggregate

d. Coarse aggregate
e. Water
f. Admixtures (including superplasticizer)
g. Bonding agent
h. Coating
i. Patching and crack injection materials
j. Retarding admixture
k. Surface-applied hot weather evaporation reducer
l. Other products not specifically mentioned.

2. Certified tests of fine and coarse aggregates meeting requirements of ASTM C33 for gradation and deleterious substances. List gradings, percent passing through each sieve size.
3. Certified statement from source of fine and coarse aggregates pertaining to history of alkali-aggregate reactivity. If State DOT acceptance is not available, provide results from ASTM C1260 and C295 testing.
4. Certified mill test analysis of cement, fly ash, and/or slag.
5. Soundness tests for fine and coarse aggregates.
6. Fine and coarse aggregate water absorption.

D. Typed letter signed by officer of supplier stating that all ingredients for proposed mixes are identical and from the same source as ingredients used for concrete in the above test reports.

E. Quality Control Submittals:
1. Contractor shall submit record of prior experience with the placement of Portland cement, including Type 1L cement. Experience record shall include a minimum of three successful placements for each component noted below. Slabs or flatworks experience shall include finishing and type of admixtures and if an accelerator/retarder was used.
   a. Slabs and beams
   b. Walls and columns
2. Manufacturer's application instructions for bonding agent and bond breaker.
3. Proposed application schedule and instructions for patching and crack injection materials.
4. Manufacturers' Certificate of Compliance:
   a. Portland cement.
   b. Admixtures.
   c. Fly ash.
   d. Aggregates.
   e. Bonding agent.
5. Admixtures: Manufacturers' Certificate of Proper Installation.
   a. Manufacturer's instructions for redosing.
   b. Superplasticizer manufacturer (vendors') recommended redosing per inch of slump gain.

6. Statements of Qualification:
    a. The Contractor's resident superintendent for concrete installation.
    b. Thermal Control Engineer: Registered Professional Engineer licensed in the Commonwealth of Pennsylvania with at least five (5) years of relevant experience in a minimum of 10 mass concrete projects of similar dimension and thermal control requirements as shown in the Contract Documents.
    c. Mix designer: Licensed Professional Engineer registered in the Commonwealth of Pennsylvania.
    d. Batch plant:
        1) Currently certified by PennDOT.
        2) Filled-in sample batch plant ticket prior to the first concrete placement.
    e. Epoxy injection applicator: Licensed by epoxy manufacturer.

~~7. Vibrator Operator: Tested and approved by the Owner.~~

~~8.~~7. Test Reports:
    a. Admixtures, test reports showing chemical ingredients and percentage of chloride in each admixture and fly ash.
    b. Source test analysis report for fly ash.
    c. Statement identifying aggregates reactivity and aggregate effects on concrete finish and appearance. Showing total chloride in each component of aggregates utilizing grinding to 50 mesh screen and determination of total chloride.
    d. For each trial mix design and signed by qualified mix designer.
    e. Cylinder test results from laboratory mixes.

~~9.~~8. Concrete Delivery Tickets:
    a. For each batch of concrete before unloading at site.
    b. Record of amount of water, cement, fine aggregate, coarse aggregate, admixtures, and fly ash.
    c. Record of placement for each batch of concrete.

F. Submit special requests for embedment of conduit, etc. Reference restrictions in Part 3 of this specification.

G. Submit a “Contractor Pre-Placement Checklist” prior to each concrete placement (form attached at end of this Specification).

H. For any concrete repair work required for Contractor cast concrete, submit a proposed repair plan with products and outline preparation and repair procedures. Include a letter from the repair product manufacturer stating that the repair contractor has had adequate training and experience to properly install the recommended products.

I. Thermal Control Plan (TCP) - Develop and submit a written TCP that describes the procedures that will be used during the period of heat dissipation following concrete

placement so that thermal control tolerances are met and maintained. The TCP shall be developed in accordance with ACI 207.1R, ACI 207.2R, and ACI 207.4R.

1. The TCP shall be developed by the Thermal Control Engineer. Shop drawings and design computations are to be designed and stamped by the Thermal Control Engineer.
2. The TCP shall include, but not be limited to, the following:
    a. Concrete mixture proportions.
    b. Calculated or measured adiabatic temperature rise of concrete.
    c. Calculated maximum temperature in placement based on conditions at time of placement and use of proposed measures to control temperatures.
    d. Description of specific measures and equipment that will be used to ensure thermal tolerances will not be exceeded.
    e. Description, drawings, and information for cooling system consisting of non-corrosive piping that is to be installed within the concrete placement volume, if used.
    f. Description of equipment and procedures that will be used to monitor and log temperatures and temperature differences.
    g. Thermal readings monitoring frequency and frequency of providing monitoring results to the Owner.
    h. Drawing showing locations for temperature sensors in placement volume.
    i. Description of format and frequency of providing thermal readings to the Owner.
    j. Description of measures to address and reduce excessive temperatures and temperature differences if they occur.
    k. Description of concrete placement plan to ensure thermal tolerances are maintained and to prevent cold joints.
    l. Description of curing, insulation, and protection procedures, including materials and methods, and curing duration.
    m. Description of insulation procedures.
3. The TCP shall summarize the construction practices that will be used to control temperatures and minimize thermal stress and cracking. These construction practices may include the following:
    a. Cooling batch water.
    b. Replace a portion of the batch water with ice.
    c. Shading aggregates in storage.
    d. Shading aggregate conveyors.
    e. Spraying aggregate stockpiles for evaporative cooling.
    f. Scheduling placements when ambient temperatures are lower, such as at night or during cooler times of the year.
    g. Post-cooling with embedded cooling pipes.
    h. Controlling surface cooling of concrete with insulation.
    i. Protecting exposed edges and corners from excessive heat loss.
    j. Monitoring ambient, material, and concrete temperatures.
    k. Other acceptable methods that are approved by the Owner.

4. Concrete with a thickness equal to or greater than 36 inches but less than 48 inches shall be included in the thermal control plan such that the temperature gain and the temperature gradient is taken into consideration and compensated for. For concrete with a thickness greater than 48 inches, refer to Part 1.2, Part 1.7 and Part 3.12.

J. Comparative Sampling and Testing Plan – For in-tunnel concreting, the Contractor shall establish a correlation between the concrete at the Point of Delivery (delivery truck) and the Pump Discharge.

1.7 MASS CONCRETE TESTING

A. Mass Concrete Thermal Testing:
   1. For each mass pour, the Contractor shall furnish two (2) temperature sensors that are to be installed at each of the following locations for a total of 12 sensors per mass pour.
      a. Center of placement volume.
      b. Center of placement area withing one foot of bottom edge.
      c. Center of placement area withing one foot of top edge.
      d. Center of placement height within one foot of side edge.
      e. Within one foot of top edge and withing one foot of side edge.
      f. At a discrete location outside of the placement volume to measure ambient temperature.
      g. Positions a, b, and c are located on the same vertical line positioned in the center of the placement area. Positions d and e are located on the same vertical line positioned within 1 foot of the side edge of placement volume.
   2. Temperatures shall be electronically recorded automatically by an approved recording device furnished by the Contractor. The recording device shall be capable of continuously recording a minimum of one reading per hour for the duration of the mass concrete temperature monitoring period. Provide backup temperature readout device in the event the primary device fails. If failure occurs in either device, that device must be repaired and calibrated before the next mass pour so there are always two (2) recording devices for each mass pour. Refer to the requirements for temperature monitoring period provided in this Section.
   3. Sensors and recorder shall be accurate to within ± 2 degrees F within the temperature range 32 to 212 degrees F.

1.8 COORDINATION

A. The Contractor shall coordinate a pre-concrete meeting at least 28 days prior to the first planned concrete placement. This meeting shall include the concrete contractor superintendent and foreman, finishing contractor, concrete Supplier, Testing Laboratory, Special Inspector, and Owner/Owner's representative. The Owner will conduct the meeting for the purpose of reviewing specification requirements and expectations for the Project.

B. Coordinate all concrete placements with architectural, electrical, HVAC, instrumentation, mechanical, plumbing, and structural drawings and specifications.

C. Coordinate installation of all cast-in/embedded items including frames, hatches, anchor rods, etc. prior to start of concrete placement. Reinforcing steel shop drawings shall include locations of pipes, vents, hatches, etc.

D. Coordinate all concrete placements with testing requirements. Reference Section 01 45 33 – Special Inspections and Testing Program.

PART 2 - PRODUCTS

2.1 CONCRETE

A. Concrete Classes and Their Use are shown in the below table:

Class	Description Of Use
A	All uses not otherwise specified below from Classes B through F.
B	Regulators, Flow Diversion Structures and Outfalls - including all walls, base and roof slabs, and secondary pour flow channels or benching structural elements; Access Shafts - including final lining, shaft caps, base slabs and flow benching structures; Drop Shafts - including final lining, divider walls, baffle structures, shaft caps, base slabs and flow benching structures; Cast-in-Place Tunnel Lining; Concrete Encasement of RCPs as indicated on Contract Drawings; Reinforced concrete (RC) collar around existing sewer at CCT-O06A-RG.
C	All secant piles (primary and secondary) in circular-shaped shaft support of excavations; Temporary reinforced concrete (RC) collars (except at CCT-O06A-RG). around or concrete blocks above existing sewers for support of excavation purposes
D	Primary secant piles in non-circular shaped support of excavations; Guide Walls for slurry walls and secant pile walls.
E	Concrete for slurry wall shafts; Secondary secant piles in non-circular shaped support of excavations; Interlocking Pipe Pile (IPP) infill concrete; Foundation H-pile rock socket backfill. Bulkhead in ORT Starter Tunnel.
F	Lean concrete, including mud slab or other indicated concrete backfills on Contract Drawings.

Class	28-Day Compressive Strength (psi)	Maximum Coarse Aggregate Size Per ASTM C33	Minimum Total Cementitious Content (Lbs/Cy)	Maximum Water/Cementitious Material Ratio[1] (By Weight)
A	4,000	#57	615	0.44
B[2]	5,000	#57	615[3]	0.40
C[4][5]	4,000	#7	550	0.44
D[5]	3,000	#467	455	0.46
E [4] [5]	5,000	#57	615[6]	0.42
F[7]	2,000	N/A	N/A	N/A

[1] W/C ratio calculation shall include water content of fine and coarse aggregates that exceeds saturated surface dry (SSD) conditions.
[2] Use less water plus a superplasticizer to achieve the lower water/cement ratio; Slump 4 inches maximum (also refer to Item I below).
[3] Fly ash content shall be 20 to 25 percent of total cementitious content. As an alternate to fly ash, use slag at 30 to 40 percent of total cementitious content. Maximum total cementitious content shall not exceed 675 lbs/CY. For all permanent structures at the ORT-O27 site, including the dewatering tunnel to the WWPS, silica fume or CNI-based corrosion inhibitor shall be added in addition to fly ash or slag.
[4] Limit air content in 4 to 7 percent range (except IPP walls and H-Piles rock socket backfill).
[5] Slump shall be 8 to 9 inches maximum.
[6] Substitute Portland cement with either 25 percent fly ash or 40 percent blast furnace slag. Maximum total cementitious material content shall not exceed 635 lbs/CY.
[7] The Contractor shall determine the mix design to achieve the specified strength.

B. Each design mix shall be prepared by the approved concrete producer with testing performed by the approved independent testing laboratory engaged by the Contractor. Design mixes shall be prepared in accordance with ACI 318, Section 5.3, "Proportioning on the Basis of Field Experience and/or Trial Mixtures". Each required design mix shall reflect the effects of the addition of all proposed or required admixtures.

C. A mix design shall be provided for each strength of concrete, maximum coarse aggregate size and admixtures used. Proposed mixes shall be submitted to the Owner at least 30 days prior to the start of concrete production. The Contractor shall not begin concrete production until the mixes have been reviewed and accepted by the Owner.

D. All concrete to be placed by pumping shall be proportioned in accordance with ACI 304R to meet the minimum strength, slump, and air content requirements as specified herein.

~~B.~~E. When determining the mix design using the trial batch method, select and proportion ingredients; sample, cure and test concrete mix through an approved independent testing laboratory engaged by the Contractor in accordance ACI 309 per ACI 211.1. Test cylinders shall be lab cured.

~~C.~~F. All concrete shall have a maximum water-soluble chloride ion (CL -) of 0.08 percent when tested in accordance with ASTM C1218, or a maximum acid-soluble chloride limit of 0.1 percent when tested in accordance with ASTM C1152.

~~D.~~G. N/A.~~All exterior concrete and concrete exposed to process fluids shall be air-entrained with an air content of 6 percent ± 1 percent by volume.~~

~~E.~~H. Slump for all flatworks shall not exceed 3 inches as measured prior to placement in the forms or against support of excavation walls. ~~and wall concrete, piers, and deep formed sections can be placed with a maximum slump of 4 inches (except as noted below).~~

~~F.~~I. Concrete with superplasticizer shall be designed for a final slump of 4 to ~~8~~ 9 inches.

J. Design mix so shrinkage test is in accordance with ASTM C157. Shrinkage test results at 28 days shall not exceed 0.03 percent for Class B concrete and 0.048 percent for Classes A, C, D and E.

K. In accordance with ASTM D1140, coarse aggregate passing the 75µm (No. 200) sieve shall be permitted in excess of 1% but not greater than 1.5% provided the material does not contain clay or shale content. Material composition as determined by X-Ray Diffraction or similar shall be included in sieve analysis submittal for Owner's approval.

2.2 MATERIALS

A. Cement:
   1. For Class B concrete, cement shall be:
      a. ASTM C150 Type II, or ASTM C595 Type IL-MS, or
      b. ASTM C150 Type I/III mixed with supplementary cementing materials, which shall be tested in accordance with ASTM C1012 and demonstrate expansions less than 0.10% after 6 months of exposure.
      c. Or mixes to be supplied which can be demonstrated to provide equivalent sulfate resistance and performance.
   2. For all other Classes, cement shall be ASTM C150 Type I/II, or ASTM C595 Type 1L.
   3. N/A. ~~If aggregates are susceptible to alkali-silica reactivity (ASR), cement shall be low alkali containing less than 0.60 percent of equivalent alkalies (Na_2O + 0.658K_2O) per ASTM C150, Table 2; unless other approved measures are included to mitigate AS~~
   4. ASTM C150 Type I/II or ASTM C595 Type 1L cement shall be used for below grade construction or when air temperatures at the time of placement are expected to exceed 80 degrees F.
   5. Combine fly ash with cement at batch plant or during production of cement in accordance with ASTM C150 Type I/II cement or ASTM C595 Type IL cement.
   6. High early-strength cement (Type III with a maximum tri-calcium aluminate (C_3A) content of 8 percent) shall only be used with advance written approval by the Owner.

B. Pozzolans:
   1. Class B concrete mix shall contain pozzolans.
   2. Fly ash shall meet the requirements of ASTM C618 Class C or Class F in accordance with Table 1 and 2, except as modified below, and not to exceed 25 percent of the combined weight of fly ash or pozzolan and cement.
      a. Loss of Ignition, Maximum: 3 percent.
      b. Maximum Carbon Content: 3 percent.
      c. Maximum Sulfur Trioxide (SO3) Content: 4 percent.
      d. Maximum water requirement (as percent of control): 100 percent.
      e. Maximum Retained on #325 Sieve: 25 percent.
   3. Fly ash analysis shall show results meeting requirements of ASTM C618 and shall show less than 5% calcium oxide (CaO) and maximum 1.5 percent of Fe_2O_3.
      a. ASTM C618, Table 1A apply when aggregates or portion of coarse or fine aggregates used are reactive as specified under Part 2.2.C of this Section.
      b. ASTM C618, Table 2A, Reactivity with Cement Alkalies, apply when aggregates or portions of aggregates are reactive as specified under Part 2.2.C of this Section.
      c. ASTM C618, Table 2A, Uniformity Requirements, apply when loss on ignition of fly ash furnished exceeds 3 percent.
   4. Blast furnace slag material shall meet the requirements of ASTM C989 Grade 100 or better. A blend of Portland cement and ground iron blast furnace slag shall contain no more than 50 percent slag. The resulting blend of cementitious material shall meet the requirements of ASTM C595.
   5. Blast furnace slag material shall be specifically manufactured to produce higher concrete strengths and provide greater resistance to chloride penetration and sulfate attack. Use "NewCem" by Blue Circle Atlantic, Inc. or equal.

C. Aggregates:
   1. Natural Aggregates:
      a. Free from deleterious coatings and substances in accordance with ASTM C33.
      b. Free of materials and aggregate types causing popouts, discoloration, staining, or other defects on surface of concrete.
   2. Fine Aggregate:
      a. Clean, sharp, natural sand.
      b. ASTM C33.
      c. Materials Passing 200 Sieve: 4 percent maximum.
      d. Limit deleterious substances in accordance with ASTM C33, Table 1 with material finer than 200 sieve limited to 3 percent, coal and lignite limited to 0.5 percent.
   3. Coarse Aggregate:
      a. Natural gravels, combination of gravels and crushed gravels, crushed stone, or combination of these materials containing no more than 15 percent flat or elongated particles (long dimension more than five times the short dimension).

b. Quantity of deleterious substances limited by Table 3 of ASTM C33 for Class 4S aggregates.
c. Graded within the limits of ASTM C33. Materials Passing 200 Sieve: 0.5 percent maximum.

4. Nonslip Aggregate:
   a. Hard, homogeneous, non-glazing, rustproof, unaffected by freezing, moisture, or cleaning compounds.
   b. Fully graded between 1/32 inch to 1/4 inch size and composed of minimum 60 percent aluminum oxide or silicon carbide abrasive bonded by vitreous ceramic material.
5. Special Aggregates for Exposed Aggregate Finishes:
   a. Uniform, hard, sound, and clean, color shall match sample.
6. Five cycle soundness tests for fine and coarse aggregates shall meet the requirements of ASTM C33.
7. Source of fine and coarse aggregates shall not have a history pertaining to alkali-aggregate reactivity. The batch plant must show written material acceptability (relative to ASR) as provided by State DOT testing. In accordance with ASTM C33, Appendix XI, paragraph X1.1. In the event that aggregate source with potential alkali-aggregate reactivity is unavoidable, at least two of the following measures shall be taken to minimize this reaction:
   a. Provide low alkali cement containing less than 0.60 percent of equivalent alkalies ($Na_2O + 0.658K_2O$) per ASTM C150, Table 2.
   b. Use lithium-based additives.
   c. Test aggregates to show non-reactivi~~e~~ty.
   d. Use fly ash or slag.

D. Mixing Water:
1. Clean and potable containing less than 50 ppm of chlorides.

E. Fiber Reinforcement:
1. ~~Concrete topping reinforced with fibers shall be in accordance with ASTM C948 or C1116. The fiber manufacturer shall provide the services of a qualified representative to attend the pre-concreting meeting and provide guidance with initial batching and placement.~~ Microfibers shall not be used as replacement for structural reinforcement. Where macrofibers are specified as potential alternatives for cast-in-place concrete tunnel linings on the Contract Drawings, it is the Contractor's responsibility to provide equivalent design and submit all required materials, including dosages, design mixes, testing results, and structural design calculations for Owner's review and approval.

2.3 ADMIXTURES

A. General:
1. Admixtures other than those specified may only be used after written approval by the Owner.

B. All admixtures shall be furnished from one manufacturer.

C. All admixtures proposed shall be selected in advance so that the appropriate trial mixes can be made.

D. Air entrainment admixture shall be added to provide entrained air in all exterior concrete in accordance with ASTM C260.
   1. ASTM C260, nontoxic after 30 days and contain no chlorides.
   2. Concrete with air-entrainment admixture added shall maintain air percentage as batched, within plus or minus 2 percent for time required for placement into structure.

E. Class A, C and D concrete mix shall contain a water-reducing admixture that meets the requirements of ASTM C494 Type A or Type D. This admixture shall not contain chlorides.

F. Class B concrete mix shall contain a high range water-reducing admixture (superplasticizer) to improve workability that meets the requirements of ASTM C494 Types F or G.
   1. ~~Hold final slump of 5 inches or greater for time required for placement into structure~~N/A.
   2. Furnish type F or G as recommended by manufacturer for allowed temperature ranges.

G. If air temperatures are expected to exceed 85 degrees F during the placement of any flatwork, a retarding admixture shall be used that meets the requirements of ASTM C494 Type D. Experience using retarders with Type 1L cement is required. Refer to Section 1.6.E.1.

H. Acceleration admixtures associated with cold weather concrete are not allowed. Reference Section 03 39 00 – Concrete Curing, for cold weather protection procedures. Experience using accelerators with Type 1L cement is required. Refer to Section 1.6.E.1.

I. Evaporation Reducer:
   1. For all concrete flatwork during hot or windy weather conditions, apply to freshly placed concrete prior to finishing. Use L&M Construction Chemicals "E-Con," Conspec (by Dayton Superior) "Aquafilm," or equal. Experience using evaporation reducers with Type 1L cement is required. Refer to Section 1.6.E.1.

J. Bonding Agent:
   1. For all toppings, housekeeping pads, and patches; when placing freshly mixed concrete against existing hardened concrete, use a corrosion inhibiting, non-vapor barrier, extended open time bonding compound. Use Sika Corporation "Armatec 110 EpoCem," Sonneborn "Sonoprep," or equal.

2. Furnish as recommended by manufacturer for surface finish, pot life, set time, vertical or horizontal application, and forming restrictions.

K. Bond Breaker: Non staining type, providing a positive bond prevention.

L. Integral Waterproofing: Concrete mix designs as indicated shall include the use of an additive designed to provide integral waterproofing and enhance concrete protection. Provide Concentrate Admix C-1000 by Xypex or approved equal.

M. After material sources have been established and approved, these sources shall not be changed for the duration of the Project. Should it be necessary that the source or manufacturer of any approved product change from the approved mix designs, the Contractor shall provide the new mix designs to meet all the requirements as noted herein.

N. The Owner may require that a field representative of the admixture manufacturer provide occasional service in the field to assure proper use of the admixture.

2.4 CONCRETE MIXING

A. General: In accordance with ACI 304R.

B. Concrete Mix Temperatures: As shown below for various stages of mixing and placing.

C. Batch Plant Central Mixing: Batch plants shall have central mixing capability. Truck mixing is prohibited.

D. Aggregates: Thoroughly and uniformly wash before use.

E. Admixtures:
1. Air-Entraining Admixture: Add at plant through manufacturer-approved dispensing equipment.
2. Water Reducers: Add prior to addition of superplasticizer.
3. Superplasticizers and Air-Entraining Admixtures:
   a. Add at concrete plant through equipment furnished or approved by admixture manufacturer.
   b. Accomplish variations in slump, working time, and air content for flowable mixes by increasing or reducing superplasticizer dose or air-entraining admixture dose at ready-mix plant only.
   c. Equipment shall provide for easy and quick visual verification of admixture amount used for each dose.
   d. Add discharge amount to each load of concrete into separate dispensing container, verify amount is correct, then add to concrete.

e. Additional dosage of superplasticizer may be added in the field using manufacturer-approved dispensing. Rotate the truck drum at maximum speed for 5 minutes after each admixture dosage.

2.5 SOURCE QUALITY CONTROL

A. Cement: Test for total chloride content.

B. Fly Ash: Test in accordance with ASTM C311.

C. Batch Plant Inspection: The Owner shall have access to and have the right to inspect batch plants, cement mills, and supply facilities of suppliers, manufacturers, and subcontractors, providing products included in these Specifications.
   1. Weighing Scales: Tested and certified within tolerances set forth in the National Bureau of Standards Handbook No. 44.
   2. Batch Plant Equipment: Either semiautomatic or fully automatic in accordance with ASTM C94.

D. Admixture: Admixture manufacturer representative shall be present at the batch plant or site for the first 5 pours and any subsequent pour as required by the Owner.

2.6 CONCRETE COATINGS

A. General:
   1. Material Quality: Manufacturer’s highest quality products and suitable for intended service.
   2. Materials Including Primer and Finish Coats: Produced by same manufacturer.
   3. Thinners, Cleaners, Driers, and Other Additives: As recommended by the manufacturer of the particular coating.

B. Product:
   1. 100 percent solids, plural component, spray applied, high build, elastomeric polyurethane/polyurea coating suitable for intended service.

PART 3 - EXECUTION

3.1 PREPARATION, MIXING, AND HANDLING OF CONCRETE

A. Batch Plant Requirements:
   1. Measurement of materials at the batch plant shall be in accordance with ASTM C94.

B. The batch plant used to supply concrete for this Project shall meet the following requirements:
   1. Weight Hoppers:
      a. The plant shall have separate weight bins for cement and aggregate.
   2. Scales:
      a. Shall measure the actual weight within an accuracy of 0.1 percent of full scale or one graduation, whichever is less. Scales shall be sealed annually by the Official Sealer of Weights and Measures.
   3. Heating and Cooling of Materials:
      a. In cold weather, the batch plant shall be equipped to heat aggregates and water to produce concrete delivery temperatures at the Project site in the range of 65 to 95 degrees F, taking into account air temperatures and site protection. Aggregates shall not contain ice or have frozen lumps nor shall they be heated to a temperature over 120 degrees F.
      b. In warm weather, the batch plant shall be equipped to cool water with ice, and cool aggregates by shading and spraying with cool water, to obtain concrete delivery temperatures at the Project site of no greater than 95 degrees F. The Contractor shall take into account drive time, slump loss, admixtures, flash set, etc. and reduce delivery temperatures as appropriate.
   4. Moisture Content:
      a. The automated batch plant shall adjust aggregate weights dispensed based on their moisture content.

C. Mixing Methods:
   1. All concrete shall be ready mixed and meet the requirements of ASTM C94. The truck mixer shall be equipped with a water tank for carrying mixing water. Water added to the mixer shall be measured to the nearest gallon by use of a water meter. For all trucks arriving on site without an operating water meter, water shall only be added manually into the back of the truck using a calibrated container. Water carried within the truck water tank shall not be used unmetered.
      Water can be added to the mixer to attain initial slump, but only within the limits of the specified water/cement ratio. After addition of water, the concrete shall be mixed at least 30 revolutions in the mixing speed range. Mixers shall meet the requirements of the "Truck Mixer and Agitator Standards" Truck Mixer Manufacturer's Bureau and shall bear their certification plate. Trucks shall be equipped with a revolution counting device.
   2. A written delivery slip or ticket, prepared and signed by the plant operator shall be made out at the proportioning plant for each truck load batch. The delivery slip shall be given to the Owner as soon as the truck arrives at the job site, and each slip shall show the information listed below, which represents actual quantities of batched materials in each truck.
      a. Truck number.
      b. Date and time truck is batched.
      c. Ticket number.
      d. Mix designation of concrete.

e. Cubic yards of concrete.
f. Cement type and weight in pounds.
g. Weight in pounds of each size and type of aggregate.
h. Admixtures, weights in pounds and/or ounces.
i. Moisture content of fine and coarse aggregates.
j. Water added to the batch at the plant.
k. Water added to the batch in transit or at the job site.

3. The driver and/or testing laboratory technician shall record the number of gallons of water added while in transit or at the job site. In no case shall the water/cement (w/c) ratio be exceeded.
   Any truck delivering concrete to the job site without a delivery slip will be rejected and shall immediately depart from the job site.
4. After completion of mixing, (while in transit or a minimum of 100 revolutions) discharge may begin immediately, otherwise the mixer shall be revolved at the agitating speed.
5. The total time interval from when the cement makes contact with the aggregates to the completion of discharge shall not exceed 90 minutes. The Owner may reduce the total time limit in hot weather or under unusual conditions if unsatisfactory results are obtained. For concrete placed by tremie method under bentonite slurry, the maximum time interval may be extended to 120 minutes, provided the approved retarding admixtures and/or superplasticizers are incorporated into the mix design to ensure slump retention of no less than 5 hours and the concrete maintains the specified slump at the point of discharge without the addition of water. Extension to 120 minutes shall be subject to prior approval by the Owner based on trial mixes and field performance testing conducted by the Contractor's testing agency at intervals not exceeding 30 minutes to verify compliance at no additional costs to the Owner. The Owner reserves the right to revert to the 90 minutes requirements at ambient temperatures higher than 90 degrees F.
6. Mixing at the Construction Site:
   a. If the time limits specified cannot be consistently achieved by mixing at the plant or in transit, concrete shall be mixed completely in the truck mixer following the addition of the mixing water at the point of deposition.
   b. Trucks shall be loaded first with coarse and fine aggregates and admixtures during which time the drum may be revolved or rocked. Cement shall be added last and the drum shall remain stationary after the cement is added until water is added at the Project site.
   c. Mixing shall begin at the Project site after the addition of water and shall continue for a minimum of 100 revolutions or until a uniform mix has been produced. Mixing time shall not exceed 15 minutes.
   d. The entire load shall be discharged within 30 minutes after mixing at the construction site has been completed.

3.2 EMBEDMENT IN CONCRETE

A. Embed no pipes other than electrical conduit in structural concrete.

B. Obtain approval from the Owner for any variation from the following requirements unless shown on the Contract Drawings. Make request in writing accompanied by suitable sketch.
   1. Do not cut or displace any reinforcement.
   2. Do not place conduit between concrete surfaces and reinforcement.
   3. Restrict O.D. of conduit to 1/4 of slab thickness. Keep within middle third of slab thickness.
   4. Place parallel conduits at least 12 inches apart.
   5. Conduits that cross must be bent such that they cross between 45 and 90 degrees from each other.
   6. Conduits that cross can touch each other, but no more than three conduits can cross at any given location.
   7. Do not embed conduit in beams.

3.3 CONCRETE PLACEMENT

A. Notify the Special Inspector, Owner, and testing laboratory a minimum of 48 hours in advance of placement to allow sufficient time for scheduling and observation of the work and for any corrective measures which are subsequently required.

B. Submit the attached "Contractor Pre-Placement Checklist" to the Owner for each scheduled concrete placement.

C. Discharge Time:
   1. Do not exceed 90 minutes for air temperatures less than 75 degrees F and 60 minutes for temperatures of 75 degrees F or greater after adding cement to water unless special approved time delay admixtures are used. Coordinate information with admixture manufacturer and Owner prior to placing concrete.
   2. Adjust slump or air content at site by adding admixtures for particular load when approved by Owner, then adjust plant dose rest of placement. Additional dosage at site shall be through an approved dispenser supplied by admixture manufacturer.
   3. Maintain required slump throughout time of concrete placement and consolidation. Discontinue use of superplasticizer if it fails to maintain slump in required range for the length of time required. Redesign mix adjusting set control admixtures to maintain setting time in the range required.

D. Preparation:
   1. The Contractor shall examine the substrate and the conditions under which concrete placement is to be performed and notify the Owner in writing of

unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Owner.

2. All reinforcement, installation of waterstop, positioning of embedded items, and condition of formwork shall be inspected and approved by Contractor's Resident Superintendent for Concrete Installation prior to the Work. The Contractor shall provide written notice of intention to place concrete a minimum of one working day prior to placement.
3. Formwork shall have been completed in conformance with Section 03 10 00 – Concrete Forming and Accessories; Ice and standing water shall have been removed; reinforcement shall have been secured in place in conformance with Section 03 20 00 – Concrete Reinforcing; expansion joint material, anchors and other embedded items shall have been positioned. Concrete shall not be placed on frozen ground.
4. Finishing installation of reinforcing and finalization of formwork concurrent with starting of concrete placement is not acceptable.
5. All porous soil or concrete surfaces against which new concrete is to be placed shall be wetted down and dampened at least one hour prior to placement. Spraying from the concrete truck hose immediately prior to placement will not be considered sufficient.

E. Concrete shall be placed in accordance with ACI 302, ACI 304, ACI 318, and ACI 350, as applicable.

F. Concrete shall be conveyed as rapidly as practicable to the point of deposit by methods which prevent the separation or loss of the ingredients.

G. Hardened concrete and foreign materials shall be removed from the inner surfaces of the conveying equipment.

H. Do not use aluminum conveying devices.

I. Vertical Free Fall Drop to Final Placement: 5 feet in forms, 8 inches or less wide and 8 feet in forms wider than 8 inches, except as specified.
   1. Super plasticized Mixes: Up to 15 feet if slump is over 6 inches.
   2. For placements where drops are greater than specified, use placement device such that free fall below placement device conforms to required value.
   3. Limit free fall to prevent segregation caused by aggregates hitting reinforcing steel.

J. Place concrete soon as possible after leaving mixer, without segregation or loss of ingredients, without splashing forms or steel above, and in layers not over 1.5 feet deep, except for slabs. Place and consolidate successive layers prior to initial set of first layer to prevent cold joints.

K. Use placement devices, for example, chutes, pouring spouts, and pumps.

L. When placing concrete, sufficient illumination shall be provided in the interior of the forms so that the concrete, at place of deposit, is visible.

M. Concrete shall be placed and vibrated in layers not to exceed 12 inches.

N. Vibration shall be applied directly to the freshly placed concrete by successive vertical penetrations of the vibrator. It shall be of sufficient duration to accomplish thorough compaction and complete embedment of waterstops, reinforcement, and other fixtures.
1. "Pencil" vibrators shall be on hand and utilized where required.
2. Vibration shall be supplemented by forking or spading by hand in the corners of forms.
3. On floor slabs, the vibrator must not ride the form supporting the slab.
4. Since the duration of vibration required is dependent on the frequency, size of vibrator, and slump of concrete, the length of time must be determined in the field.
5. Vibrators shall not be used to move concrete laterally within the forms.
6. Consolidate concrete with internal vibrators with minimum frequency of 8,000 cycles per minute and amplitude required to consolidate concrete in section being placed.
7. Provide at least one standby vibrator in operable condition at placement site prior to placing concrete.
8. Consolidation equipment and methods shall conform to ACI 309R.
9. Provide sufficient windows in forms or limit form height to allow for concrete placement through windows and for visual observation of concrete.
10. Vibration consolidation shall not exceed a distance of 5 feet from point of placement.
11. Vibrate concrete in vicinity of joints to obtain impervious concrete.

O. Place concrete continuously and at full depth of slabs (so as not to permit cold joints) between predetermined expansion, construction, and contraction joints.

P. Joints in Footings and Slabs:
1. Ensure space beneath waterstop completely fills with concrete.
2. During concrete placement, make visual inspection of entire waterstop area.
3. Limit concrete placement to elevation of waterstop in first pass, vibrate concrete under waterstop, ~~lift waterstop to confirm full consolidation without voids,~~ place remaining concrete to full height of slab.
4. Apply procedure to full length of waterstops.

Q. If reinforcement is in direct sunlight or is more than 20 degrees F higher in temperature than concrete temperature before placement, wet reinforcement with water fog spray before placing concrete to cool reinforcement.

R. Round off top exposed edges of walls with a 1/4-inch radius steel edging tool.

S. Conveyor Belts and Chutes:
   1. Design and arrange ends of chutes, hopper gates, and other points of concrete discharge throughout conveying, hoisting, and placing system for concrete to pass without becoming segregated.
   2. Do not use chutes longer than 50 feet.
   3. Minimum Slopes of Chutes: Angled to allow concrete to readily flow without segregation.
   4. Conveyor Belts:
      a. Approved by the Owner.
      b. Wipe clean with device which does not allow mortar to adhere to belt.
      c. Cover conveyor belts and chutes.

T. Retempering: Not permitted for concrete where cement has partially hydrated.

U. Maximum Size of Concrete Placements:
   1. Where expansion joints or contraction joints are not shown or where expansion joints or where wall expansion or contraction joints are spaced more than 30 feet from wall corners or intersections, provide intermediate construction joints at maximum spacing of 30 feet.
   2. Consider beams, girders, brackets, column capitals, and haunches as part of floor or roof system and place monolithically with floor or roof system.
   3. Should placement sequence result in cold joint located below finished water surface, install water stop in joint.
   4. Base slabs may be cast in a single pour unless a pour sequence or joints are shown on the Contract Drawings.

V. Removal of Water: Remove water from space to be occupied by concrete.

W. Consolidation and Visual Observation:
   1. Consolidate concrete with internal vibrators with minimum frequency of 8,000 cycles per minute and amplitude required to consolidate concrete in section being placed.
   2. Provide at least one standby vibrator in operable condition at placement site prior to placing concrete.
   3. Consolidation equipment and methods shall conform to ACI 309R.
   4. Provide sufficient windows in forms or limit form height to allow for concrete placement through windows and for visual observation of concrete.
   5. Vibration consolidation shall not exceed a distance of 5 feet from point of placement.
   6. Vibrate concrete in vicinity of joints to obtain impervious concrete there.

3.4 PUMPING CONCRETE

A. Pumping Concrete:
   1. Minimum Pump Hose (Conduit) Diameter: 4 inches.

2. Replace pumping equipment and hoses (conduits) that are not functioning properly.
3. If the pump operator does not have direct visual contact with the location of concrete placement, two-way radio communications shall be provided.
4. Replace pumping equipment and hoses (conduits) that are not functioning properly.
5. Do not use initial concrete from hose discharge at the beginning of pumping operating.
6. Additional pumping equipment shall be on-site at all times for use as a backup.

3.5 CONCRETE WORK IN HOT OR COLD WEATHER

A. The Contractor shall conform to ACI 305R, ACI 306R, and Section 03 39 00 – Concrete Curing, when concreting during hot or cold weather as defined by ACI 305R and ACI 306R.

~~B. Conveyor Belts and Chutes:~~
~~1. Design and arrange ends of chutes, hopper gates, and other points of concrete discharge throughout conveying, hoisting, and placing system for concrete to pass without becoming segregated.~~
~~2. Do not use chutes longer than 50 feet.~~
~~3. Minimum Slopes of Chutes: Angled to allow concrete to readily flow without segregation.~~
~~4. Conveyor Belts:~~
~~a. Approved by the Owner.~~
~~b. Wipe clean with device which does not allow mortar to adhere to belt.~~
~~c. Cover conveyor belts and chutes.~~

~~C. Retempering: Not permitted for concrete where cement has partially hydrated.~~

~~D. Maximum Size of Concrete Placements:~~
~~1. Where expansion joints or contraction joints are not shown or where expansion joints or contraction joints are spaced at more than 60 feet, or where wall expansion or contraction joints are spaced more than 30 feet from wall corners or intersections, provide intermediate construction joints at maximum spacing of 40 feet.~~
~~2. Consider beams, girders, brackets, column capitals, and haunches as part of floor or roof system and place monolithically with floor or roof system.~~
~~3. Should placement sequence result in cold joint located below finished water surface, install water stop in joint.~~
~~4. Base slabs may be cast in a single pour unless a pour sequence or joints are shown on the Contract Drawings.~~

~~E.~~B. ~~Minimum Time Between Adjacent Placements:~~N/A
~~1. Construction Joints: Six (6) days.~~

~~2. Contraction Joints: Six (6) days.~~
~~3. Expansion Joints: One (1) day.~~

~~F. Removal of Water: Remove water from space to be occupied by concrete.~~

~~G. Consolidation and Visual Observation:~~
~~1. Consolidate concrete with internal vibrators with minimum frequency of 8,000 cycles per minute and amplitude required to consolidate concrete in section being placed.~~
~~2. Provide at least one standby vibrator in operable condition at placement site prior to placing concrete.~~
~~3. Consolidation Equipment and Methods: ACI 309R.~~
~~4. Provide sufficient windows in forms or limit form height to allow for concrete placement through windows and for visual observation of concrete.~~
~~5. Vibration consolidation shall not exceed a distance of 5 feet from point of placement.~~
~~6. Vibrate concrete in vicinity of joints to obtain impervious concrete there.~~

~~H.~~C. Hot Weather:
1. Prepare ingredients, mix, place, cure, and protect in accordance with ACI 305R.
2. Placement frequency shall be such that lift lines will not be visible in architectural concrete finishes.
3. Maintain concrete temperature below 90 degrees F at time of placement. Ingredients may be cooled before mixing.
4. Make provisions for windbreaks, shading, fog spraying, sprinkling, ice, or wet cover, or other means to provide concrete with temperature specified.
5. Prevent differential temperature between reinforcing steel and concrete.
6. Evaporation Retardant: As specified in Section 03 39 00 – Concrete Curing.

~~I.~~D. Cold Weather:
1. Maintain surface temperature of concrete above 40 degrees F and cure concrete as specified in Section 03 39 00 – Concrete Curing, for minimum of 7 days.
2. Provide maximum and minimum thermometers placed on concrete surfaces spaced throughout Work to allow monitoring of concrete surface temperatures representative of Work.
3. In accordance with ACI 306R and ACI 318.
4. External Heating Units:
   a. Vent heating units to atmosphere, and do not locally heat or dry concrete. Where water cure is specified, maintain wet condition.
   b. Do not exhaust flue gases directly into an enclosed area to prevent concentrated carbon dioxide from causing concrete carbonation.

~~J.~~E. Maintain curing conditions as specified in Section 03 39 00 – Concrete Curing.

~~K.~~F. Minimum temperature in enclosures at any place in the enclosure is 35 degrees F.

3.6 CONCRETE BONDING

A. To New Concrete Wall Horizontal Construction Joints:
   1. Thoroughly clean and saturate joint with water.
   2. Superplasticizer addition must create a 6- to 8-inch slump.
   3. Thoroughly vibrate to mix and consolidate grout and concrete together.

B. To Old Concrete:
   1. Mechanically roughen existing concrete surfaces to a clean, rough surface using a "Blastrac" by Wheelabrator-Frye, Inc.; or "Porta-Shotblast" by Nelco Manufacturing Corp, to remove existing concrete surface, and provide a minimum roughness profile of 1/4 inch.
   2. Saturate surface with water for 12 hours, and place concrete as specified for new concrete.

3.7 PATCHING

A. General:
   1. Inject cracks with crack repair epoxy.
   2. Prior to starting patching work, obtain quantities of color-matched patching material and manufacturer's detailed instructions for use to provide a structural patch with finish to match adjacent surface.
   3. Develop patching techniques with epoxy manufacturer on mockup panel.
   4. Dress surface of patches that will remain exposed to view to match color and texture of adjacent surfaces. Begin patching with materials and methods used in approved patching sample. Patching of concrete shall provide a structurally sound surface finish, uniform in appearance or upgrade finish by other means until acceptable to the Owner.
   5. Inject all cracks 0.005 inch and larger.

B. Tie Holes:
   1. Fill with Category I or II grout as specified in Section 03 60 00 – Grouting except where sealant is shown. Use only enough water to dry pack.
   2. Match color of adjacent concrete.
   3. Compact grout using steel hammer and steel tool to drive grout to high density. Cure grout with water.

C. Alternate Form Ties -Through-Bolts:
   1. Seal through-bolt hole by sandblasting or mechanically cleaning and roughening entire interior surface of hole, epoxy coating roughened surface and driving elastic vinyl plug and then dry packing entire hole on each side of plug with Category II grout, as specified in Section 03 60 00 – Grouting. Use only enough water to dry pack grout. Dry pack while epoxy is still tacky or remove epoxy by mechanical means and reapply new epoxy.

2. Fill through-bolt openings with Category II grout, as specified in Section 03 60 00 – Grouting.
3. Compact grout using steel hammer and steel tool to drive grout to high density. Cure grout with water.

D. Defective Areas:
1. Remove defective concrete to a depth of sound concrete.
2. Small shallow holes caused by air entrapment at surface of forms shall not be considered defective unless amount is so great as to be considered not the standard of the industry.
3. If chipping or saw cutting is required, make edges perpendicular to surface with a minimum of 1/2 inch in depth. Do not feather edges. Obtain Owner's approval of chipping work.
4. Chipping and sawcut areas shall be rectangular in appearance. Avoid over cuts when using a saw.
5. Patch defective area to match appearance of adjacent concrete surfaces after cracks are filled.
6. Inject all cracks 0.005 inch and larger.

E. Blockouts at Pipes or Other Penetrations:
1. Meet details shown or submit proposed blockouts for review.
2. Use nonshrink, nonmetallic grout or concrete of the same class as the surrounding concrete.

3.8 BACKFILL AGAINST WALLS

A. Do not backfill against walls until concrete has obtained 28-day compressive strength. Walls that are to have roof slabs are not to be backfilled until roof slab as obtained its 28-day strength or is fully braced against lateral movement. Walls that are out of vertical tolerance shall be repaired at the Contractors expense.

B. Place backfill simultaneously on both sides of wall, where required, to prevent differential pressures.

3.9 EQUIPMENT AND HOUSEKEEPING PADS

A. The Contractor shall provide minimum 4-inch-high concrete housekeeping pads for all mechanical, plumbing, heating, air conditioning and electrical equipment. Concrete equipment pads shall have a minimum height of 6 inches.

B. If greater thicknesses are shown on the Contract Drawings or required by the equipment being installed, provide thickness required. Verify all sizes, locations, and anchors with various contractors.

C. If sizes are not shown on the Contract Drawings, provide concrete pads 6 inches wider than the equipment in all directions.

D. Prior to placing concrete for housekeeping/equipment pads, use a bonding agent and prepare surface in accordance with manufacturer's technical data.

3.10 CONCRETE FINISHING

A. All flatwork concrete shall be finished immediately after placement per Section 03 35 00 – Concrete Finishing.

B. All formed concrete shall be finished after form removal.

3.11 CONCRETE CURING

A. All concrete shall be cured for a minimum of seven days (and simultaneously protected from hot or cold weather conditions). Submittals required for procedures; follow requirements of Section 03 39 00 – Concrete Curing.

3.12 MASS CONCRETE

A. Produce a structure free of shrinkage cracks that would result from high hydration heat during curing of mass concrete pours. Accomplish this through appropriate concrete mix design and management of concrete temperature and temperature differential to maintain thermal tolerances as specified in this Section and/or the Contract Drawings.

B. Compliance with this specification may result in longer curing and protection times. Consider options that control heat of hydration and are compatible with the desired construction schedule.

C. The Thermal Control Engineer shall develop a Thermal Control Plan as specified for approval by the Owner. The Thermal Control Plan will outline the construction methods proposed to control thermal related distress, a monitoring plan, and contingency plan. Refer to requirements for Thermal Control Engineer and Thermal Control Plan elsewhere in this Specification.

D. The Contractor shall furnish and install all monitoring devices and cooling system equipment identified for use in the Thermal Control Plan, including any and all devices that are to be used as backup or for contingency purposes.

E. The Thermal Control Engineer shall personally inspect and approve the installation of monitoring devices and cooling system and verify the process of recording temperature data is effective. The Thermal Control Engineer or his/her trained representative shall be present for the entire mass pour placement and shall monitor recorded temperature data hourly, at a minimum, to verify thermal tolerances are being met.

F. Recording of temperature data shall begin when mass concrete pour operations begin and shall be performed every hour throughout the thermal monitoring period.

G. The Contractor shall submit to the Owner, daily readings of all temperature monitoring sensors. The Contractor shall provide both the raw data and plots of the data using Excel. For each sensor, plot the following information:
   1. Temperature versus Time: x-axis = time since monitoring began in units of hours, and y-axis = recorded sensor temperature in Fahrenheit. Show sensor results relative to tolerance value.
   2. Temperature Difference versus Time: x-axis = time since monitoring began in units of hours, and y-axis = temperature difference between sensor and all other sensors. Show sensor results versus tolerance value.

H. The thermal monitoring period begins when concrete placement operations begin and ends when each sensor shows the concrete is cooling from its maximum temperature and meets all of the following criteria:
   1. Concrete surface temperature is within 20 degrees F of ambient temperature.
   2. Maximum temperature differential for any two sensors is 35 degrees F or less.
   3. Maximum decrease in temperature measured for all sensors changes less than 20 degrees F in a 24-hour period following removal of protection.
   4. Minimum of seven days after concrete placement is complete.
   5. If conditions change (such as change in ambient air temperature, change in insulation or protection, shutting cooling system off, etc.), that could result in an increase in temperature, thermal monitoring should be resumed.

I. Cure and protect concrete for a minimum of seven (7) days, until thermal monitoring period is complete, and until all thermal tolerances and requirements specified are met.

J. If thermal tolerances are exceeded at any time, the Contractor shall take immediate corrective action to ensure that thermal tolerances are brought back within specified limits and maintained throughout concrete placement and the thermal monitoring period.

K. If thermal tolerances are exceeded, the Thermal Control Engineer shall perform all analyses and tests deemed necessary by the Owner at no additional cost to determine the structural integrity and durability of the mass concrete element to the satisfaction of the Owner. Based on the analyses and test results, a determination of corrective action will be made by the Owner, which may include, but not limited to, price adjustment, epoxy injection in thermal cracks, and/or removal of non-compliant concrete.

L. The Thermal Control Engineer shall submit a written report that includes all monitored information to the Owner within seven calendar days of monitoring completion for a given mass pour.

3.13 INCOMPLETE STRUCTURES

A. Structures which are incomplete may not be capable of withstanding backfill, hydrostatic, surcharge, storage and other permanent or temporary loading conditions imposed during construction. Such loading conditions shall be the sole responsibility of the Contractor.

3.14 TESTING FOR QUALITY ASSURANCE

~~A. The Contractor shall hire and pay for the services of an independent testing laboratory to perform testing for quality assurance in accordance with this Section, Sections 01 45 00 – Quality Requirements, and Section 01 45 33 – Special Inspections and Testing Program. This testing will consist of materials verification, w/c ratio (microwave test), temperature, slump, air content determination, weight per cubic foot of fresh concrete, and tests for the compressive strength. These test results can be used by the Contractor to supplement and assist his own quality control program. Independent testing lab technician shall produce all test cylinders. The Contractor shall provide all support needed for the production of test cylinders.~~

~~B. Testing will be required for each placement in excess of 5 cubic yards.~~

~~C. Location of Field Tests: All sampling for field tests (cylinders, air content, slump) shall be performed at the delivery truck to allow proper correlation of the tests.~~

~~D. When concrete is being pumped, testing shall be performed at the pump discharge for meeting the requirements of this specification and to reflect material changes through the pump.~~

~~E. The following tests will be performed by the testing laboratory:~~

~~1. Water to Cement (w/c) Ratio:~~

~~a. The w/c ratio shall be calculated and recorded for each truckload of concrete delivered to the job site. This calculation shall account for all moisture in the mix including water added in transit and at the job site and moisture in both fine and coarse aggregates (adjusted for absorption). Verification of calculated w/c shall be obtained via a microwave test in accordance with AASHTO TP 23.~~

~~b. Concrete which exceeds the w/c ratio specified shall not be utilized.~~

~~2. Temperature:~~

~~a. Recorded for each batch of concrete delivered.~~

~~3. Slump tests shall be made on each batch of concrete delivered, in accordance with ASTM C143.~~

~~4. Air Content Test (Fresh Concrete):~~

~~a. Test for entrained air content in accordance with ASTM C231. Concrete which does not contain the proper amount of entrained air shall not be utilized.~~

b. A minimum of two tests will be required for each day of operations. Also, at least one test shall be made for each 50 cubic yards and each class of concrete placed within a single day.
c. In the event that test results are outside the limits specified, additional tests shall be required to show that concrete meets the Specification requirements or the concrete shall not be used on this Project.
d. Concrete for test cylinders shall be obtained near the middle of the concrete placement.

5. Unit weight (density) of the fresh concrete shall be measured in accordance with ASTM C138. The unit weight shall be recorded at the same interval as required for air content testing as stated above.
6. Compressive Strength Test:
   a. Samples of concrete will be prepared and tested for compressive strength in accordance with ACI 301; ASTM C31, C39, and C172; except as modified herein.
   b. At least one sampling will be taken for each 50 cubic yards of each class of concrete placed within a single day. No more than one sampling may be taken from a single batch to satisfy this requirement.
   c. One sampling will consist of at least eight test cylinders (4 x 8). The Contractor shall order additional sets of field cured test cylinders for determination of 80 percent strength gain to facilitate form removal and/or termination of cold weather protection.
   d. Each cylinder will be identified by a tag, furnished by the Contractor, which will be hooked or wired to the side of the container.
   e. It is the Contractor's responsibility that cylinders for verification of concrete quality be stored in a temperature-controlled curing box, provided by the Contractor on the construction site, for 24 hours after they have been molded and held at a temperature between 60 degrees F and 80 degrees F. The Contractor shall provide high/low thermometer to verify temperature range.
   f. After 24 hours, these samples will be transported to the testing laboratory and moist cured until tested. Three cylinders will be tested at 7 days, three tested at 28 days, and two held in reserve for testing at 56 days as needed.
   g. When field temperatures during the 24 hours immediately preceding the time of concrete placement have exceeded 90 degrees F, or have been less than 40 degrees F, or when freezing, hot weather, or other extraordinary field curing conditions are anticipated, or when requested by the Owner, Six additional cylinders for quality verification shall be molded at each sampling for field curing periods of 5, 21, and 49 days. Field cured cylinders used for quality verification shall be tested: one at 7 days, three at 28 days, and two held in reserve for testing at 56 days as needed.
   h. All field cure cylinders shall be located by the Contractor to be cured at the structure as near to the point where the sampled concrete was placed as practicable. These field cured cylinders shall receive the same protection and

~~be subject to the same environmental conditions as that portion of structure represented.~~

~~i. Field cured cylinders shall be transported to the laboratory and stored at laboratory room temperature and conditions until testing.~~

~~j. When quality verification field cured cylinders fail to reach 85 percent of the specified compressive strength, immediately institute a program to improve field curing/protection conditions and/or mix design.~~

~~k. If the Owner has reason to believe that low field cured cylinder tests reflect concrete strengths in the structure, the Owner shall have the authority to order additional tests provided for below.~~

~~l. Should the Contractor desire additional field cured cylinders to facilitate form removal, termination of cold weather protection, backfill, or any other reason, the Contractor shall coordinate and pay the testing laboratory directly.~~

~~m. After job site storage, all concrete test cylinders shall be transported in rigid boxes specifically sized and constructed to prevent cylinders from becoming damaged from tipping, falling, rolling, or bumping.~~

~~n. After a mean value of a ratio between 7-day and 28-day strengths has been established from 10 or more samplings the 7-day strengths shall subsequently be taken as a preliminary indication of the 28-day strengths.~~

~~o. Thereafter, should a 7-day test strength from any sampling be more than 10 percent lower than the 7-day strength which corresponds with the specified 28-day compressive strength:~~

~~1) Immediately provide an additional seven days of wet curing in the affected area from which the deficient test cylinders were taken.~~

~~2) Correct the mix for the next concrete placement.~~

~~p. From laboratory cured specimens, the strength level of concrete will be evaluated for acceptance based on criteria in ACI 301, Chapter 17. Concrete is considered satisfactory if all of the following conditions are satisfied:~~

~~1) The average of 28-day cylinder tests for any three consecutive samplings shall meet or exceed the strength required for the mix specified.~~

~~2) No more than one of the compressive test cylinders shall have a strength less than that specified.~~

~~3) No individual compressive strength test result falls below the specified strength by more than 500 psi.~~

~~q. In the event that the above conditions are not met, additional tests shall be performed as outlined in Part 3.16 of this Section. Field cured specimens are not included in the above acceptance criterion. Field cured cylinder test results provide supplementary information only.~~

A. The Contractor shall hire and pay for the services of an Independent Testing Laboratory and personnel to perform field and laboratory testing for quality assurance in accordance with this Section, Sections 01 45 00 – Quality Requirements, and

Section 01 45 33 – Special Inspections and Testing Program. This testing program will consist of:

1. Materials verification as indicated on each delivery ticket in comparison with the material requirements for each specific placement location and structural element being poured.
2. Onsite testing of slump, temperature, air content, unit weight, and water/cement (W/C) ratio, of fresh concrete taken at location of sampling and testing.
3. Laboratory testing of compressive strength on test cylinders produced from location of sampling.

B. The Contractor shall provide the necessary volume of concrete and all support needed for the production of test samples and cylinders noted above.

C. Locations of Sampling and Testing for Non-Tunnel Structures

1. For Support of Excavation wall concreting, including slurry walls and secant piles walls, sampling and onsite testing shall be performed at the Point of Delivery.
2. For above ground and NSF Permanent Structures concreting, sampling and onsite testing shall be performed at the Point of Delivery or the Pump Discharge, as applicable.
3. For Shaft Lining and Structures concreting, sampling and onsite testing shall be performed at the Point of Delivery or the Pump Discharge, as applicable.

D. Locations of Sampling and Testing for Cast-in-Place Tunnel Structures

1. When concrete is pumped to the Point of Placement, concrete sampling for testing shall initially occur at both the Point of Delivery and Pump Discharge to establish the Comparative Sampling and Testing Plan (see Part 3.14.E). The intent is to develop a correlation between delivered concrete mixes including admixtures, pumping distance and verify any changes in concrete properties. Once the plan is approved, subsequent concrete sampling shall be permitted at the Point of Delivery only with any required adjustment in mix design.
2. When remix trucks are used from the shaft bottom to deliver concrete to the tunnel, sampling and testing shall be performed at the Point of Delivery inside the tunnel, or after a Comparative Sampling and Testing Plan has been conducted, sampling and testing can be performed at the Point of Delivery above ground.

E. Comparative Sampling and Testing Plan

1. For cast-in-place concrete tunnels of 200 feet and longer, a Comparative Sampling and Testing Plan and corresponding measures to adjust for design mixes shall be submitted thirty days prior to tunnel concreting at each site for Owner's approval. All resulting concrete mix redesigns shall be at no additional cost to the Owner.
2. The Plan shall at a minimum consist of one set of samples required for the specified testing from each of the first five (5) delivery trucks at both the Point of Delivery above ground and Pump Discharge (or Point of Delivery inside the tunnel if remix trucks are used).

3. After the testing, the concrete design mix shall be adjusted to account for property changes resulting from pumping or in-tunnel transport distance so that the concrete at the Point of Placement meets the requirements specified herein. Once an adjusted concrete mix has been established, the Owner will determine new acceptance limits which will be applicable for sampling and testing at the Point of Delivery above ground.
4. Sampling and testing to be included in the Plan shall consist of Slump, Temperature, Air content, Unit Weight; Water/Cement Ratio; Segregation (in accordance with the limits established in ASTM C1610 or ASTM C1712); and cylinders for laboratory compression testing.

F. Field and Laboratory Testing Requirements
1. Slump: Slump tests shall be made on each truckload of concrete delivered, in accordance with ASTM C143.
2. Temperature: Temperature shall be recorded for each truckload of concrete delivered.
3. Air Content: Test for entrained air content in accordance with ASTM C231. Concrete that does not contain the proper amount of entrained air shall not be utilized.
   a. One test shall be made for each 50 cubic yards placed within a single day.
   b. In the event that test results are outside the limits specified, additional tests shall be required to show that concrete meets the Specification requirements or the concrete shall not be used on this Project
4. Unit Weight: Unit weight of fresh concrete shall be measured in accordance with ASTM C138. The unit weight shall be recorded at the same interval as required for air content testing as stated above.
5. The W/C ratio: The W/C ratio shall be calculated and recorded for each truckload of concrete delivered to the job site. This calculation shall account for all moisture in the mix Verification of calculated W/C shall be obtained via a microwave test in accordance with AASHTO TP 23. Concrete which exceeds the W/C ratio specified shall not be utilized
6. Compressive Strength Test (laboratory):
   a. Samples of concrete shall be prepared and tested for compressive strength in accordance with ACI 301; ASTM C31, C39, and C172; except as modified herein.
   b. At least one set of samples shall be taken for each 50 cubic yards of concrete placed within a single day.
   c. The set of samples shall consist of at least eight test cylinders (4 inch x 8-inch). Three cylinders will be tested at 7 days, three tested at 28 days, and two shall be held in reserve for testing at 56 days as needed.
   d. Should the Contractor desire additional field prepared cylinders to facilitate form removal, termination of cold weather protection, backfill, or any other reason, the Contractor shall coordinate and pay the testing laboratory directly for the additional testing.

e. Each cylinder will be identified by a tag, furnished by the Contractor, which will be hooked or wired to the side of the container.
f. The Contractor shall provide a temperature-controlled curing box(es) for storage of field prepared test cylinders. The curing box shall be of sufficient size to accommodate the maximum number of test cylinders cast for any daily placement. The location of the curing box shall be in an area that is free from disturbance and vibration, such as pile driving and traffic. Cylinders shall be stored for curing for 24 hours after they have been molded and held at a temperature between 60 degrees F and 80 degrees F. The Contractor shall provide high/low thermometer to verify temperature range.
g. After 24 hours, these samples shall be transported to the testing laboratory and moist cured until tested.
h. After job site storage, all concrete test cylinders shall be transported in rigid boxes specifically sized and constructed to prevent cylinders from becoming damaged from tipping, falling, rolling, or bumping.
i. When field prepared cylinders fail to reach 75% of the specified compressive strength after 28-days, the Contractor and Owner shall meet to determine the cause and develop a program to improve concrete quality and field curing/protection conditions. All concrete placement activities shall terminate until an improvement plan is approved.
j. After testing for 10 or more samples has been completed for both 7-day and 28-day breaks, a moving average of the most recent 10 breaks will be utilized for predicting 28-day breaks. Should a 7-day break deviate from the moving average by 10%, the Contractor shall:
    1) Immediately provide an additional seven days of wet curing in the affected area from which the deficient test cylinders were taken.
    2) Determine the cause of the low break and propose corrective action to be incorporated into the next concrete placement.
k. If the Owner has reason to believe that low field prepared cylinder tests reflect concrete strengths in the structure, the Owner shall have the authority to order additional tests provided for below and corrective actions at no additional cost to the Owner.

3.15 ADDITIONAL TESTS

A. When unsatisfactory test results arise, additional tests as outlined below shall be performed and at no additional cost be paid for by the Contractor.

B. Compressive Strength:
    1. In the event that one or more standard samples represented by the average of the 28-day test cylinders fail to meet the strength requirements as outlined above, or if tests of field cured cylinders indicate the possibility of deficiencies in protection and curing, concrete core specimens shall be obtained and tested from the affected area. Additionally, a minimum of two 56-day cylinders may be used to verify concrete strength subject to owner approval.

C. Three cores shall be taken for each sample in which the strength requirements were not met. The drilled cores shall be obtained and tested in conformance with ASTM C42; the tests to be conducted by the Contractor's independent testing laboratory.
   1. Coordinate locations with embedded items. Cores shall not include reinforcement.
   2. A core specimen shall be taken perpendicular to the concrete surface and shall be taken from near the middle of a unit of deposit when possible and not near formed joints or obvious edges of a unit deposit.
   3. The diameter of core specimens should be at least 4 inches. The length of specimen, when capped, shall be at least twice the diameter of the specimen.
   4. The core specimens shall be carefully handled while transported to the laboratory. Cores shall be tested and evaluated in accordance with ACI 301, Chapter 17. On the same day as they are drilled, core holes shall be repaired with non-shrink grout by the Contractor.

D. The concrete in question will be considered acceptable if the average of three core specimen compressive strength tests meet or exceed the strength required for the mix specified. No individual strength test result shall fall below the specified strength by more than 500 psi.

E. Load Tests:
   1. If compressive strength requirements under the above procedure are not met by the results of core tests, then the Owner may order load tests pursuant to ACI 318. Such tests shall be at the Contractor's expense.

F. Air Content:
   1. In the event that concrete placed by the Contractor is suspected of or is tested and shown to not have proper air content or erratic air test results are obtained as specified above, the Contractor’s independent testing laboratory shall obtain and test samples for air content in accordance with ASTM C457 and to recommend modification to mix components or additives if the test criteria are not met. The Contractor shall be responsible for remediation to the satisfaction of the Owner.

G. Admixture Segregation Test: Test each truck prior to use on job.
   1. Segregation Test Objective: Concrete with 5- to 9-inch slump must stay together when slumped. Segregation is assumed to cause mortar to flow out of mix even though aggregate may stay piled enough to meet slump test.
   2. Test Procedure: Make slump test and check for excessive slump and observe to see if mortar or moisture flows from slumped concrete.
   3. Reject concrete if mortar or moisture separates and flows out of mix.

H. Cold Weather Placement Tests:
   1. During cold weather concreting, cast cylinders for field curing as follows. Use method that will produce greater number of specimens.
      a. Six extra test cylinders from the last 100 cubic yards of concrete.

b. Minimum three specimens for each 2 hours of placing time or for each 100 cubic yards.

2. These specimens shall be in addition to those cast for laboratory testing.
3. Protect test cylinders from the weather until they can be placed under same protection provided for the concrete of the structure that they represent.
4. Keep field test cylinders in same protective environment as the parts of the structure they represent to determine if specified strength has been obtained.
5. Test cylinders in accordance with applicable sections of ASTM C31 and C39.
6. Use test results to determine specified strength gain prior to falsework removal or for prestressing.

I. Tolerances:

1. Walls: Measure and inspect walls for compliance with tolerances specified in Section 03 10 00 – Concrete Forming and Accessories.
2. Slab Finish Tolerances and Slope Tolerances:
   a. Floor flatness measurements will be made the day after floor is finished and before shoring is removed, to eliminate effects of shrinkage, curing, and deflection.
   b. Support 10-foot-long straightedge at each end with steel gauge blocks of thicknesses equal to specified tolerance.
   c. Compliance with designated limits in four of five consecutive measurements is satisfactory unless defective conditions are observed.

3.16 PROTECTION OF INSTALLED WORK

A. After curing as specified in Section 03 39 00 – Concrete Curing, and after applying final floor finish, cover slabs with plywood or particle board or plastic sheeting or other material to keep floor clean and protect it from material and damage due to other construction work.

B. Patch and repair defective areas and areas damaged by construction.

3.17 REPAIR OF CAST-IN-PLACE CONCRETE

A. For concrete repair, refer to specification Section 03 01 30 – Concrete Repair and Rehabilitation.

END OF SECTION

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Addendum No. 12

Attachment E

APPENDIX A – TECHNICAL SPECIFICATIONS

SECTION 01 31 00

- Attachment 11 – City of Pittsburgh DOMI ROW Permits associated with six near surface sites in Pittsburgh (13 pages)

Attachment 11

City of Pittsburgh DOMI ROW Permits associated with six near surface sites in Pittsburgh

- DOMI-ROW-2025-15016
- DOMI-ROW-2025-15133
- DOMI-ROW-2025-15136
- DOMI-ROW-2025-15137
- DOMI-ROW-2025-15138
- DOMI-ROW-2025-15151

Department of Mobility and Infrastructure
City of Pittsburgh
412 Blvd of the Allies
Pittsburgh, PA 15219

DOMI-ROW-2025-15016

ROW PERMIT

Issued Date: January 06, 2026
Expires Date: N/A

Permit Holder: Debbie Healey Langley
Company: N/A
Phone: () -
Resolution Date: N/A

Permit Address: 862 PROGRESS ST, Pittsburgh, PA 15212-,
BOLIN Way: CARPENTER Way to PROGRESS ST,
BOLIN Way: S CANAL ST to CARPENTER Way,
CARPENTER Way: BOLIN Way to CHESTNUT ST,
CARPENTER Way: CHESBRO ST to BOLIN Way,
CARPENTER Way: WARFIELD ST to CHESBRO ST,
CHESBRO ST: CARPENTER Way to S CANAL ST,
CHESBRO ST: PROGRESS ST to CARPENTER Way,
PROGRESS ST: BOLIN Way to CHESTNUT ST,
PROGRESS ST: CHESBRO ST to BOLIN Way,
PROGRESS ST: MADISON AVE to WARFIELD ST,
PROGRESS ST: WARFIELD ST to CHESBRO ST,
S CANAL ST: BOLIN Way to CHESTNUT ST,
S CANAL ST: CHESBRO ST to BOLIN Way,
S CANAL ST: WARFIELD ST to CHESBRO ST,
WARFIELD ST: CARPENTER Way to S CANAL ST,
WARFIELD ST: PROGRESS ST to CARPENTER Way
Ward #: 23
Parcel #: 0009B00040000000
Council District: 1
Property Owner: ALLEGHENY COUNTY SANITARY AUTHORITY

Resolution Number: N/A

PERMIT DETAILS

Work Description:	ALCOSAN'S OHIO RIVER TUNNEL PROJECT (ORT) IS A WASTEWATER INFRASTRUCTURE PROJECT FOR THE PURPOSE OF REDUCING COMBINED SEWER OVERFLOWS TO THE RIVERS. THERE ARE 6 SITES WHERE BELOW GROUND WASTEWATER INFRASTRUCTURE WORK AND WORK ON THE SURFACE WILL OCCUR. SOME CITY ROWS WILL TEMPORARILY BE AFFECTED.
Special Permit Instructions:	FINAL RESTORATION PLANS TO BE SUBMITTED FOR REVIEW PRIOR TO RESTORATION COMMENCING. REVISIONS MAY BE REQUIRED BASED ON LEVEL OF DISTURBANCE IN THE FIELD. ALL WORK TO ADHERE TO LEGAL AGREEMENT BETWEEN ALCOSAN AND CITY OF PITTSBURGH.
Inspection:	N/A

DEVELOPMENT DESCRIPTION: THE ORT PROJECT IS CONSTRUCTION OF NEW WASTEWATER INFRASTRUCTURE TO CONNECT TO EXISTING WASTEWATER INFRASTRUCTURE, FOR THE PURPOSE OF REDUCING COMBINED SEWER OVERFLOWS TO THE RIVERS. THE WASTEWATER INFRASTRUCTURE WILL BE BELOW GROUND. NO BUILDINGS WILL BE AT THIS SITE. THE ROZA NUMBER FOR THIS SITE IS DCP-ZDR-2023-09091. THERE ARE TWO BDA NUMBERS ASSOCIATED WITH THE OVERALL PROJECT: BDA-2024-07449 AND BDA-2024-07450; NOTE THAT THE BDAS ARE ASSOCIATED WITH SITES A58 AND O27, RESPECTIVELY. THE TWO SMALL BUILDINGS ARE NOT AT THIS SITE; THEY ARE AT A58 AND O27.

PERMIT TERMS & CONDITIONS:

• NO CHANGES OR ADJUSTMENTS MAY BE MADE TO THE APPROVED PLANS WITHOUT AUTHORIZATION BY DOMI. CHANGES OR ADJUSTMENTS WITHOUT APPROVAL MAY RESULT IN THE REVOCATION OF APPROVAL.
• THE APPROVAL OF THIS PLAN DOES NOT RELIEVE OF THE APPLICANT OF OBTAINING PERMITS REQUISITE FOR CONSTRUCTION.
• ALL WORK IN THE ROW MUST FOLLOW CITY CONSTRUCTION STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE APPROVED PLAN. NO DEVIATION FROM STANDARDS AND SPECIFICATIONS WITHOUT PRIOR APPROVAL FROM DOMI.

INFORMATION ON THIS PERMIT CAN BE OBTAINED BY SCANNING:

Department of Mobility and Infrastructure
City of Pittsburgh
412 Blvd of the Allies
Pittsburgh, PA 15219

DOMI-ROW-2025-15133

ROW PERMIT

Issued Date: January 06, 2026
Expires Date: N/A

Permit Holder: Debbie Healey Langley
Company: N/A
Phone: () -
Resolution Date: N/A

Resolution Number: N/A

Permit Address: 417 NORTH POINT DR, Pittsburgh, PA 15233-,
BELMONT ST: NORTH POINT DR to DEAD END,
NORTH POINT DR: NORTH POINT DR to REEDSDALE ST
Ward #: 21
Parcel #: 0007F00098000001
Council District: 6
Property Owner: ALLEGHENY COUNTY SANITARY AUTHORITY

PERMIT DETAILS

Work Description:	ALCOSAN'S OHIO RIVER TUNNEL PROJECT (ORT) IS A WASTEWATER INFRASTRUCTURE PROJECT FOR THE PURPOSE OF REDUCING COMBINED SEWER OVERFLOWS TO THE RIVERS. THERE ARE 6 SITES WHERE BELOW GROUND WASTEWATER INFRASTRUCTURE WORK AND WORK ON THE SURFACE WILL OCCUR. SOME CITY ROWS WILL TEMPORARILY BE AFFECTED.
Special Permit Instructions:	FINAL RESTORATION PLANS TO BE SUBMITTED FOR REVIEW PRIOR TO RESTORATION COMMENCING. REVISIONS MAY BE REQUIRED BASED ON LEVEL OF DISTURBANCE IN THE FIELD. ALL WORK TO ADHERE TO LEGAL AGREEMENT BETWEEN ALCOSAN AND CITY OF PITTSBURGH
Inspection:	N/A

DEVELOPMENT DESCRIPTION: THE ORT PROJECT IS CONSTRUCTION OF NEW WASTEWATER INFRASTRUCTURE TO CONNECT TO EXISTING WASTEWATER INFRASTRUCTURE, FOR THE PURPOSE OF REDUCING COMBINED SEWER OVERFLOWS TO THE RIVERS. THE WASTEWATER INFRASTRUCTURE WILL BE BELOW GROUND. NO BUILDINGS WILL BE AT THIS SITE. THE ROZA FOR THIS SITE IS DCP-ZDR-2023-04308. THERE ARE TWO BDA NUMBERS ASSOCIATED WITH THIS OVERALL PROJECT: BDA-2024-07449 AND BDA-2024-07450; NOTE THAT THE BDAS ARE ASSOCIATED WITH SITES A58 AND O27, RESPECTIVELY. THE TWO SMALL BUILDINGS ARE NOT AT THIS SITE; THEY ARE AT A58 AND O27.

PERMIT TERMS & CONDITIONS:

• NO CHANGES OR ADJUSTMENTS MAY BE MADE TO THE APPROVED PLANS WITHOUT AUTHORIZATION BY DOMI. CHANGES OR ADJUSTMENTS WITHOUT APPROVAL MAY RESULT IN THE REVOCATION OF APPROVAL.
• THE APPROVAL OF THIS PLAN DOES NOT RELIEVE OF THE APPLICANT OF OBTAINING PERMITS REQUISITE FOR CONSTRUCTION.
• ALL WORK IN THE ROW MUST FOLLOW CITY CONSTRUCTION STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE APPROVED PLAN. NO DEVIATION FROM STANDARDS AND SPECIFICATIONS WITHOUT PRIOR APPROVAL FROM DOMI.

INFORMATION ON THIS PERMIT CAN BE OBTAINED BY SCANNING:

Department of Mobility and Infrastructure
City of Pittsburgh
412 Blvd of the Allies
Pittsburgh, PA 15219

DOMI-ROW-2025-15136

ROW PERMIT

Issued Date: January 06, 2026
Expires Date: N/A

Permit Holder: Debbie Healey Langley
Company: N/A
Phone: () -
Resolution Date: N/A

Resolution Number: N/A

Permit Address: 477 MARTINDALE ST, Pittsburgh, PA 15212-,
MARTINDALE ST: SCOTLAND ST to MERCHANT ST,
TETRA DR: SCOTLAND ST to DEAD END
Ward #: 22
Parcel #: 0008F00105000000
Council District: 1
Property Owner: 501 MARTINDALE ASSOCIATES LP

PERMIT DETAILS

Work Description:	ALCOSAN'S OHIO RIVER TUNNEL PROJECT (ORT) IS A WASTEWATER INFRASTRUCTURE PROJECT THAT CONNECTS TO EXISTING WASTEWATER INFRASTRUCTURE, FOR THE PURPOSE OF REDUCING COMBINED SEWER OVERFLOWS TO THE RIVERS. THERE ARE 6 SITES WHERE BELOW GROUND WASTEWATER INFRASTRUCTURE WORK AND WORK ON THE SURFACE WILL OCCUR. SOME CITY ROWS WILL TEMPORARILY BE AFFECTED.
Special Permit Instructions:	FINAL RESTORATION PLANS TO BE SUBMITTED FOR REVIEW PRIOR TO RESTORATION COMMENCING. REVISIONS MAY BE REQUIRED BASED ON LEVEL OF DISTURBANCE IN THE FIELD. ALL WORK TO ADHERE TO LEGAL AGREEMENT BETWEEN ALCOSAN AND CITY OF PITTSBURGH
Inspection:	N/A

DEVELOPMENT DESCRIPTION: THE ORT PROJECT IS CONSTRUCTION OF NEW WASTEWATER INFRASTRUCTURE TO CONNECT TO EXISTING WASTEWATER INFRASTRUCTURE, FOR THE PURPOSE OF REDUCING COMBINED SEWER OVERFLOWS TO THE RIVERS. THE WASTEWATER INFRASTRUCTURE WILL BE BELOW GROUND. NO BUILDINGS WILL BE AT THIS SITE. THE ROZA FOR THIS SITE A48 IS DCP-ZDR-2023-04272. THERE ARE TWO BDA NUMBERS ASSOCIATED WITH THE OVERALL PROJECT, BDA-2024-07449 AND BDA-2024-07450; NOTE THAT THE BDAS ARE ASSOCIATED WITH SITES A58 AND O27, RESPECTIVELY. THE TWO SMALL BUILDINGS ARE NOT AT THIS SITE; THEY ARE AT A58 AND O27.

PERMIT TERMS & CONDITIONS:

• NO CHANGES OR ADJUSTMENTS MAY BE MADE TO THE APPROVED PLANS WITHOUT AUTHORIZATION BY DOMI. CHANGES OR ADJUSTMENTS WITHOUT APPROVAL MAY RESULT IN THE REVOCATION OF APPROVAL.
• THE APPROVAL OF THIS PLAN DOES NOT RELIEVE OF THE APPLICANT OF OBTAINING PERMITS REQUISITE FOR CONSTRUCTION.
• ALL WORK IN THE ROW MUST FOLLOW CITY CONSTRUCTION STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE APPROVED PLAN. NO DEVIATION FROM STANDARDS AND SPECIFICATIONS WITHOUT PRIOR APPROVAL FROM DOMI.

INFORMATION ON THIS PERMIT CAN BE OBTAINED BY SCANNING:

Department of Mobility and Infrastructure
City of Pittsburgh
412 Blvd of the Allies
Pittsburgh, PA 15219

DOMI-ROW-2025-15137

ROW PERMIT

Issued Date: January 06, 2026
Expires Date: N/A

Permit Holder: Debbie Healey Langley
Company: N/A
Phone: () -
Resolution Date: N/A

Permit Address: 731 E LACOCK ST, Pittsburgh, PA 15212-,
E LACOCK ST: VOEGHTLY ST to MADISON AVE,
MADISON AVE: RIVER AVE to E LACOCK ST,
PROGRESS ST: MADISON AVE to WARFIELD ST,
RIVER AVE: VOEGHTLY ST to MADISON AVE,
VOEGHTLY ST: RIVER AVE to E LACOCK ST
Ward #: 23
Parcel #: 0009A00170000000
Council District: 1
Property Owner: ALLEGHENY COUNTY SANITARY AUTHORITY

Resolution Number: N/A

PERMIT DETAILS

Work Description:	ALCOSAN'S OHIO RIVER TUNNEL PROJECT (ORT) IS A WASTEWATER INFRASTRUCTURE PROJECT TO CONNECT TO EXISTING WASTEWATER INFRASTRUCTURE, FOR THE PURPOSE OF REDUCING COMBINED SEWER OVERFLOWS TO THE RIVERS. THERE ARE 6 SITES WHERE BELOW GROUND WASTEWATER INFRASTRUCTURE WORK AND WORK ON THE SURFACE WILL OCCUR. SOME CITY ROWS WILL TEMPORARILY BE AFFECTED.
Special Permit Instructions:	FINAL RESTORATION PLANS TO BE SUBMITTED FOR REVIEW PRIOR TO RESTORATION COMMENCING. REVISIONS MAY BE REQUIRED BASED ON LEVEL OF DISTURBANCE IN THE FIELD. ALL WORK TO ADHERE TO LEGAL AGREEMENT BETWEEN ALCOSAN AND CITY OF PITTSBURGH
Inspection:	N/A

DEVELOPMENT DESCRIPTION: THE ORT PROJECT IS CONSTRUCTION OF NEW WASTEWATER INFRASTRUCTURE TO CONNECT TO EXISTING WASTEWATER INFRASTRUCTURE, FOR THE PURPOSE OF REDUCING COMBINED SEWER OVERFLOWS TO THE RIVERS. THE WASTEWATER INFRASTRUCTURE WILL BE BELOW GROUND. ONE SMALL GATE CONTROL BUILDING, WHICH IS ESSENTIAL FOR THE OPERATION OF THE WASTEWATER INFRASTRUCTURE, WILL BE ABOVE GROUND AT THIS SITE. THE ROZA FOR THIS SITE IS DCP-ZDR-2023-04282. THERE ARE TWO BDA NUMBERS ASSOCIATED WITH THIS

PROJECT: BDA-2024-07449 AND BDA-2024-07450; NOTE THAT THE BDAS ARE ASSOCIATED WITH SITES A58 AND O27, RESPECTIVELY.

PERMIT TERMS & CONDITIONS:

• NO CHANGES OR ADJUSTMENTS MAY BE MADE TO THE APPROVED PLANS WITHOUT AUTHORIZATION BY DOMI. CHANGES OR ADJUSTMENTS WITHOUT APPROVAL MAY RESULT IN THE REVOCATION OF APPROVAL.
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INFORMATION ON THIS PERMIT CAN BE OBTAINED BY SCANNING:

Department of Mobility and Infrastructure
City of Pittsburgh
412 Blvd of the Allies
Pittsburgh, PA 15219

DOMI-ROW-2025-15138

ROW PERMIT

Issued Date: January 06, 2026
Expires Date: N/A

Permit Holder: Debbie Healey Langley
Company: N/A
Phone: () -
Resolution Date: N/A

Resolution Number: N/A

Permit Address: 3300 PREBLE AVE #625, Pittsburgh, PA 15233-,
TRACY ST: BEAVER AVE to DEAD END,
WESTHALL ST: BEAVER AVE to DEAD END
Ward #:
Parcel #: 0075R00272000000
Council District:
Property Owner: ALLEGHENY COUNTY SANITARY AUTHORITY

PERMIT DETAILS

Work Description:	ALCOSAN'S OHIO RIVER TUNNEL PROJECT (ORT) IS A WASTEWATER INFRASTRUCTURE PROJECT THAT CONNECTS TO EXISTING WASTEWATER INFRASTRUCTURE, FOR THE PURPOSE OF REDUCING COMBINED SEWER OVERFLOWS TO THE RIVERS. THERE ARE 6 SITES WHERE BELOW GROUND WASTEWATER INFRASTRUCTURE WORK AND WORK ON THE SURFACE WILL OCCUR. SOME CITY ROWS WILL TEMPORARILY BE AFFECTED.
Special Permit Instructions:	FINAL RESTORATION PLANS TO BE SUBMITTED FOR REVIEW PRIOR TO RESTORATION COMMENCING. REVISIONS MAY BE REQUIRED BASED ON LEVEL OF DISTURBANCE IN THE FIELD. ALL WORK TO ADHERE TO LEGAL AGREEMENT BETWEEN ALCOSAN AND CITY OF PITTSBURGH
Inspection:	N/A

DEVELOPMENT DESCRIPTION: THE ORT PROJECT IS CONSTRUCTION OF NEW WASTEWATER INFRASTRUCTURE TO CONNECT TO EXISTING WASTEWATER INFRASTRUCTURE, FOR THE PURPOSE OF REDUCING COMBINED SEWER OVERFLOWS TO THE RIVERS. THE WASTEWATER INFRASTRUCTURE WILL BE BELOW GROUND. THERE IS ONE SMALL GATE CONTROL BUILDING, WHICH IS ESSENTIAL FOR THE OPERATION OF THE WASTEWATER INFRASTRUCTURE, THAT WILL BE ABOVE GROUND AT THIS SITE. THE ROZA NUMBER FOR THIS SITE IS DCP-ZDR-2023-04310. THERE ARE TWO BDA NUMBERS ASSOCIATED WITH THE OVERALL PROJECT: BDA-2024-07449 AND BDA-2024-07450; NOTE THAT THE BDAS ARE ASSOCIATED WITH SITES A58 AND O27, RESPECTIVELY.

PERMIT TERMS & CONDITIONS:

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• THE APPROVAL OF THIS PLAN DOES NOT RELIEVE OF THE APPLICANT OF OBTAINING PERMITS REQUISITE FOR CONSTRUCTION.
• ALL WORK IN THE ROW MUST FOLLOW CITY CONSTRUCTION STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE APPROVED PLAN. NO DEVIATION FROM STANDARDS AND SPECIFICATIONS WITHOUT PRIOR APPROVAL FROM DOMI.

INFORMATION ON THIS PERMIT CAN BE OBTAINED BY SCANNING:

Department of Mobility and Infrastructure
City of Pittsburgh
412 Blvd of the Allies
Pittsburgh, PA 15219

DOMI-ROW-2025-15151

ROW PERMIT

Issued Date: January 06, 2026
Expires Date: N/A

Permit Holder: Debbie Healey Langley
Company: N/A
Phone: () -
Resolution Date: N/A

Resolution Number: N/A

Permit Address: 1758 RIVERSIDE AVE, Pittsburgh, PA 15219-,
MUSK Way: W CARSON ST to RIVERSIDE AVE,
RIVERSIDE AVE: MUSK Way to DEAD END
Ward #: 19
Parcel #: 0007P00125000000
Council District: 2
Property Owner: ALLEGHENY COUNTY SANITARY AUTHORITY

PERMIT DETAILS

Work Description:	ALCOSAN'S OHIO RIVER TUNNEL PROJECT (ORT) IS A WASTEWATER INFRASTRUCTURE PROJECT THAT WILL CONNECT TO EXISTING WASTEWATER INFRASTRUCTURE, FOR THE PURPOSE OF REDUCING COMBINED SEWER OVERFLOWS TO THE RIVERS. THERE ARE 6 SITES WHERE BELOW GROUND WASTEWATER INFRASTRUCTURE WORK AND WORK ON THE SURFACE WILL OCCUR. SOME CITY ROWS WILL TEMPORARILY BE AFFECTED.
Special Permit Instructions:	FINAL RESTORATION PLANS TO BE SUBMITTED FOR REVIEW PRIOR TO RESTORATION COMMENCING. REVISIONS MAY BE REQUIRED BASED ON LEVEL OF DISTURBANCE IN THE FIELD. ALL WORK TO ADHERE TO LEGAL AGREEMENT BETWEEN ALCOSAN AND CITY OF PITTSBURGH
Inspection:	N/A

DEVELOPMENT DESCRIPTION: THE ORT PROJECT IS CONSTRUCTION OF NEW WASTEWATER INFRASTRUCTURE TO CONNECT TO EXISTING WASTEWATER INFRASTRUCTURE, FOR THE PURPOSE OF REDUCING COMBINED SEWER OVERFLOWS TO THE RIVERS. THE WASTEWATER INFRASTRUCTURE WILL BE BELOW GROUND. NO BUILDINGS WILL BE AT THIS SITE. THE ROZA NUMBER FOR THIS SITE O14 IS DCP-ZDR-2023-04311. THERE ARE TWO BDA NUMBERS ASSOCIATED WITH THE OVERALL PROJECT: BDA-2024-07449 AND BDA-2024-07450; NOTE THAT THE BDAS ARE ASSOCIATED WITH SITES A58 AND O27, RESPECTIVELY. THE TWO SMALL BUILDINGS ARE NOT AT THIS SITE; THEY ARE AT A58 AND O27. DOMI HAS APPROVED THE ENCROACHMENT ASSOCIATED WITH THIS SITE. THIS APPROVED PERMIT IS DOMI-EN-2024-10274.

PERMIT TERMS & CONDITIONS:

• NO CHANGES OR ADJUSTMENTS MAY BE MADE TO THE APPROVED PLANS WITHOUT AUTHORIZATION BY DOMI. CHANGES OR ADJUSTMENTS WITHOUT APPROVAL MAY RESULT IN THE REVOCATION OF APPROVAL.
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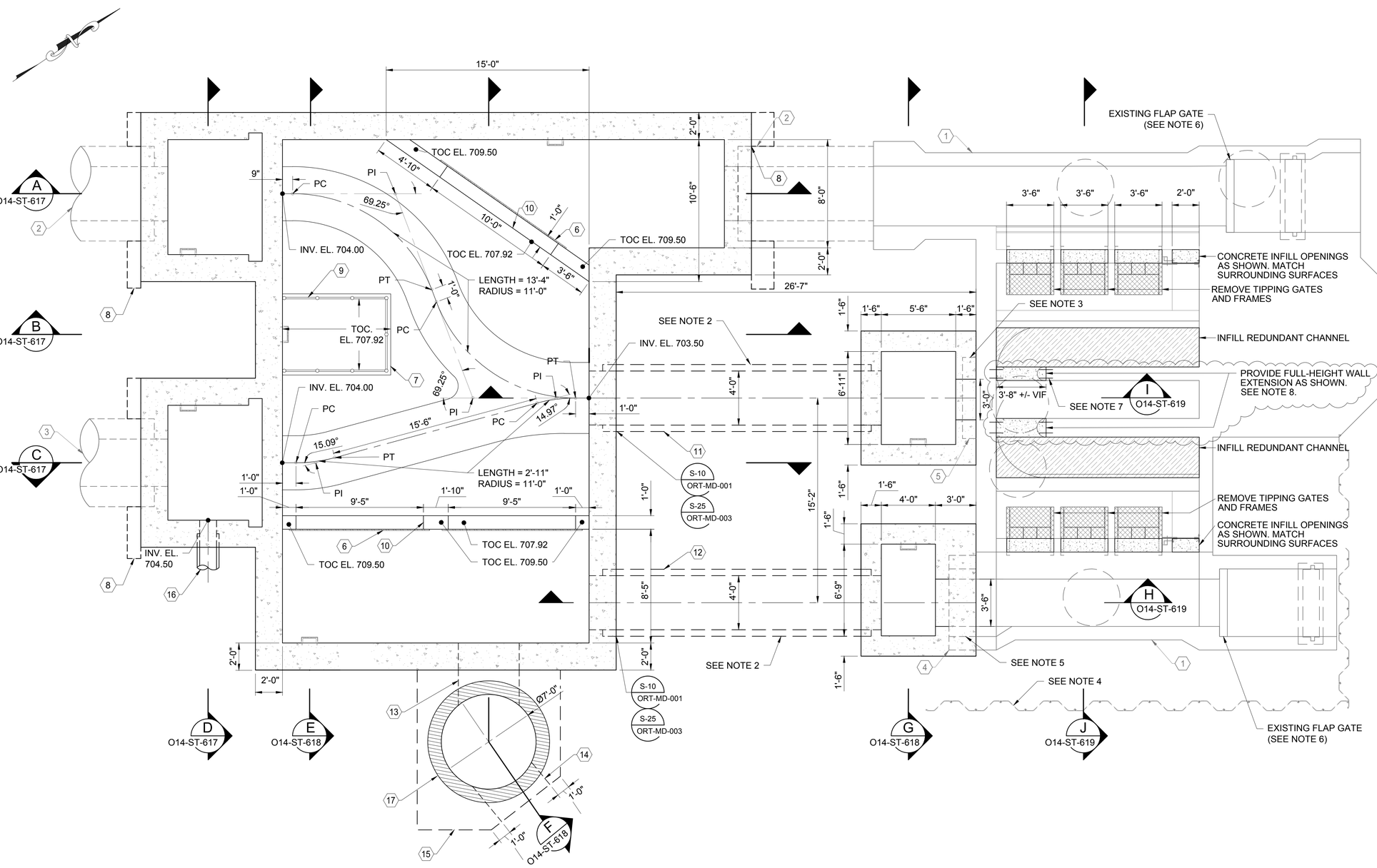
INFORMATION ON THIS PERMIT CAN BE OBTAINED BY SCANNING:

Addendum No. 12

Attachment F

APPENDIX B - CONTRACT DRAWINGS

- Revised O14-ST-616 (Sheet 556 of 770)
- Revised O14-ST-619 (Sheet 559 of 770)



NOTES

1. SEE SHEET O14-ST-615 FOR NOTES RELATED TO THIS WORK.
2. SEE SHEET O14-ST-619 FOR 48" RCP CONNECTION PROFILES.
3. EXISTING BULKHEAD TO BE REMOVED.
4. APPROXIMATE LOCATION OF EXISTING SHEET PILES.
5. STEP IN EXISTING BOX CULVERT - SEE SECTION G IN O14-ST-618.
6. THE CONTRACTOR SHALL CONDUCT A FIELD INSPECTION OF THE EXISTING FLAP GATES INSIDE THE EXISTING O14 REGULATOR AND ANY REQUIRED LEAKAGE REPAIR TO PREVENT POTENTIAL RIVER WATER FROM ENTERING THE EXCAVATION AREA THROUGH THE REGULATOR.
7. DOWEL AND EPOXY SET #5 DOWEL @ 12" OC EF H W/ HILTI HIT HY200-V3 (EMB. DEPTH 6" INTO EXISTING REGULATOR) AT BOTH ENDS OF WALL EXTENSION. (1)
8. EXISTING CONCRETE WALL BULLNOSE TO BE SAWCUT AND SURFACE PREPARED FOR EXTENSION POUR. FULL HEIGHT CONCRETE WALL EXTENSION TO BE INSTALLED WITH #5@12" OC EF H REINFORCEMENT TO MATCH DOWELS AND EXISTING WALL REINFORCEMENT .

STRUCTURAL KEY NOTES

1. EXIST. REGULATOR - SEE CIVIL SHEETS (NOTE 2 ON O14-ST-615)
2. EXIST. 48" ID RCP SEWER - SEE CIVIL SHEETS (NOTE 2 ON O14-ST-615)
3. EXIST. 42" ID RCP SEWER - SEE CIVIL SHEETS (NOTE 2 ON O14-ST-615)
4. EXIST. BOX CULVERT
5. EXIST. BULKHEAD
6. ADJUSTABLE WEIR PLATE - SEE SHEET O14-ME-600
7. PLATFORM
8. CONCRETE COLLAR - SEE SHEET O14-ST-609
9. HANDRAIL
10. WEIR PLATE CONCRETE SUPPORT
11. SMRT-O14-CS1 - 48" ID RCP SEWER - SEE CIVIL SHEETS (NOTE 2 ON O14-ST-615)
12. SMRT-O14-CS2 - 48" ID RCP SEWER - SEE CIVIL SHEETS (NOTE 2 ON O14-ST-615)
13. SMRT-O14-CS3 - 54" RCP - SEE CIVIL SHEETS (NOTE 2 ON O14-ST-615)
14. SMRT-O14-CS4 - 54" RCP - SEE CIVIL SHEETS (NOTE 2 ON O14-ST-615)
15. SMRT-O14-MH3 - SEE CIVIL SHEETS (NOTE 2 ON O14-ST-615)
16. SMRT-O14-S2 - SEE CIVIL SHEETS (NOTE 2 ON O14-ST-615)
17. 84" ID STRAIGHT PRECAST RISER

LEGEND

PC POINT OF CURVE

PT POINT OF TANGENT

PI POINT OF INTERSECTION

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

PLAN @ EL. 714.00

Designed by:	REVISION			
AP/RNT	REV No.	DATE	DESCRIPTION	APPV
Drawn by:	1	01/12/26	REVISION FOR ADDENDUM 12	ZC
JMS				
Checked by:				
PSK				

MOTT MACDONALD
Two Allegheny Center
Nova Tower 2, Suite 1301
Pittsburgh, PA 15212
(412) 497 - 2900

811 Dial 8-1-1 or 1-800-242-1776 not less than 3 business days nor more than 10 business days prior to the start of excavation.
Pennsylvania One Call System Serial Number
FINAL DESIGN TICKET # 20250040207

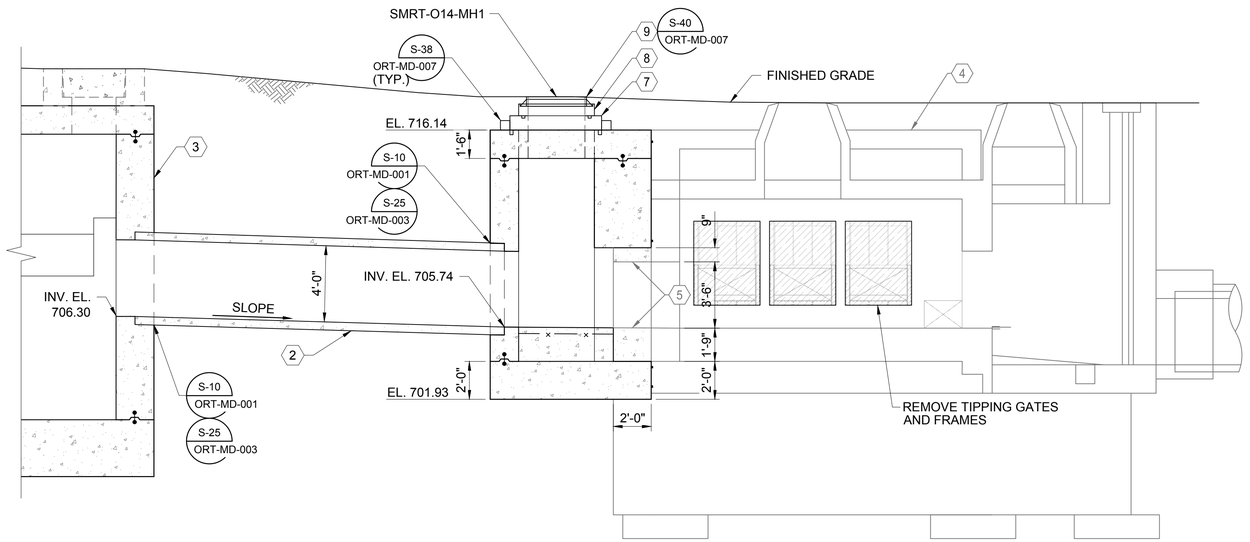
COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER PRZEMYSLAW SZCZEPAN KOBIALKA NO. 068314

ARLETTA SCOTT WILLIAMS
EXECUTIVE DIRECTOR, ALCOSAN
3300 PREBLE AVE.
PITTSBURGH, PA 15233
(412) 766 - 4810
www.alcosan.org

ALLEGHENY COUNTY SANITARY AUTHORITY (ALCOSAN)
OHIO RIVER TUNNEL (ORT)

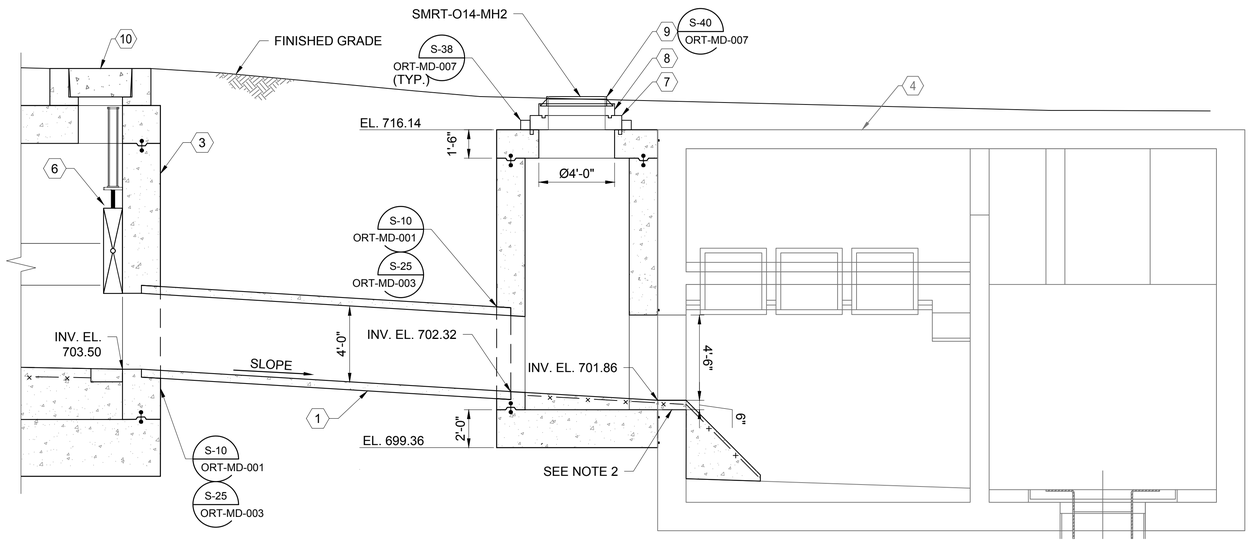
O14-ST-616
SMRT-O14-RG PLAN
SHEET 2 OF 2

Contract:	1797
File:	O14-ST-616.dwg
Date:	07/30/2025
Sheet:	556 OF 770



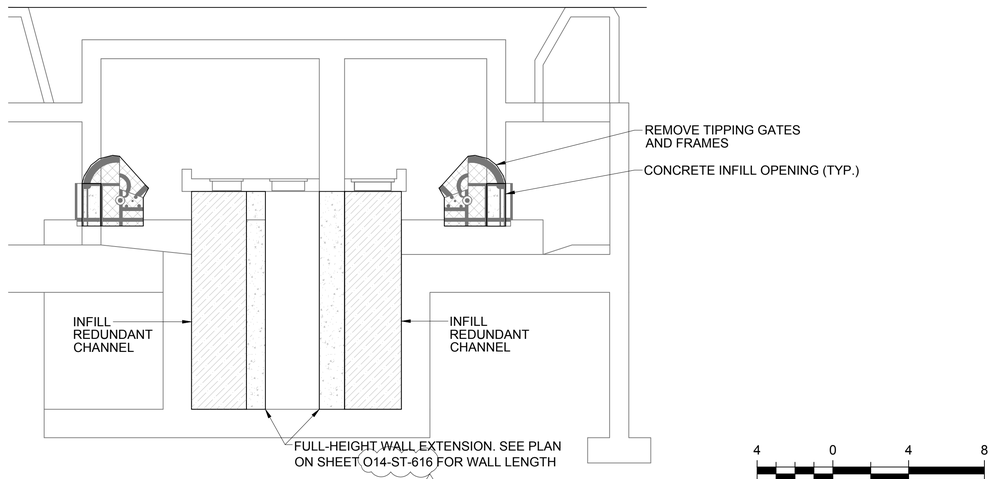
SECTION H

O14-ST-615
O14-ST-616



SECTION I

O14-ST-615
O14-ST-616



SECTION J

O14-ST-615
O14-ST-616

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

NOTES

1. SEE SHEET O14-ST-615 FOR NOTES RELATED TO THIS WORK.
2. STEP IN EXISTING BOX CULVERT.

STRUCTURAL KEY NOTES

1. SMRT-O14-CS1 - 48" ID RCP SEWER - SEE PLAN
2. SMRT-O14-CS2 - 48" ID RCP SEWER - SEE PLAN
3. SMRT-O14-RG - SEE PLAN
4. EXIST. REGULATOR - SEE PLAN
5. EXIST. BOX CULVERT - SEE PLAN
6. SLIDING GATE
7. 48" ID ECCENTRIC TOP SLAB (TYP.)
8. 36" ID PRECAST MH RISER
9. 36" ERGO XL ASSEMBLY (TYP.)
10. PRECAST REMOVABLE PLANK (TYP.)

Designed by: AP/RNT
Drawn by: JMS
Checked by: PSK

REVISION			
REV No.	DATE	DESCRIPTION	APPV
1	01/12/26	REVISION FOR ADDENDUM 12	ZC

MOTT MACDONALD
Two Allegheny Center
Nova Tower 2, Suite 1301
Pittsburgh, PA 15212
(412) 497 - 2900

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COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER PRZEMYSLAW STEFAN OBIALA NO. 068314

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ALLEGHENY COUNTY SANITARY AUTHORITY (ALCOSAN)
OHIO RIVER TUNNEL (ORT)

O14-ST-619
SMRT-O14-RG SECTIONS
SHEET 3 OF 3

Contract: 1797
File: O14-ST-619.dwg
Date: 07/30/2025
Sheet: 559 OF 770