alcosan
allegheny county sanitary authority

December 15, 2025

CONTRACT NO. 1797

OHIO RIVER TUNNEL

ADDENDUM No. 9

All bidders bidding **Contract No. 1797** shall read and take note of this **Addendum No. 9.** The Contract Documents for **Contract No. 1797 – Ohio River Tunnel** are hereby revised and/or clarified as stated below.

Acknowledgement of Contract No. 1797; Addendum No. 9

The Acknowledgement attached to **Addendum No. 9** 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

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

ACKNOWLEDGEMENT OF

CONTRACT NO. 1797 – OHIO RIVER TUNNEL

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

ADDENDUM No. 9

FIRM NAME: _____

SIGNATURE: _____

TITLE: _____

DATE: _____

December 15, 2025
CONTRACT NO. 1797
OHIO RIVER TUNNEL
ADDENDUM No. 9

ATTENTION:
BIDS DUE: 11:00 A.M., prevailing time, on Monday, January 26, 2026
DEADLINE FOR QUESTIONS: 5:00 P.M., Friday, December 19, 2025
DEADLINE FOR CORE SHED VISITS: Wednesday, December 17, 2025

This Addendum No. 009 consists of 53 total pages including the following attachments:

Attachment A – APPENDIX B – CONTRACT DRAWINGS (3 sheets)
- Revised ORT-ST-011 (Sheet 079 of 770)
- Revised CCT-ST-011 (Sheet 092 of 770)
- Revised SMRT-ST-002 (Sheet 095 of 770)

Attachment B – APPENDIX E - SUPPLEMENTAL INFORMATION (FOR INFORMATION ONLY) (12 pages)
- Norfolk Southern PC Line Retaining Wall Rehabilitation As-Builts - Near A48

Attachment C – APPENDIX E - SUPPLEMENTAL INFORMATION (FOR INFORMATION ONLY) (14 pages including Appendix E flysheet)
- O-14 Flap Gate Improvements (ALCOSAN Contract 1617)

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. 9

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

Q1 *GBR Sections 7.8.8 and 8.2 and Tables 7.3 and 8.2 provide baseline percentages of rock types for the TBM and non-TBM tunnels where the undifferentiated Class 7 interbedded rock makes up the majority of the expected ground conditions in four of the six tunnels. Class 7 includes those materials associated with clogging (55% Class 2 Siltstone) and the Class 1 Sandstone that has a significantly higher UCS strength than the other rock types is shown to be as much as 35% of the Class 7 materials. The rationale for grouping these materials together is that the "…interlayering of the first six rock classes was so complex…" Section 7.8.8 also states that "These proportions are averaged over the Project alignment; local conditions will contain differing proportions, including being entirely within one classification." For baseline purposes, please provide lengths of tunnel where more than 75% of the face height (or area) that will be "entirely within" Class 1 or Class 2/Class 4 materials since such conditions will have material influences on advance rate estimates as well as slurry design and muck handling.*

A1 **Under GBR Section 7.8.8 pertaining to the interbedded Class 7 Rock, the maximum full length of each other class within the Class 7 Rock has been added to Table 7.3 for baseline purposes. On a project wide scale, the lengths of tunnel where full face (or more than a certain proportion of the face height) that will be within a certain class rock are evident as shown on the Plates and shall be read from these baseline geological profiles. See Section B, Item 1, for CHANGES TO CONTRACT DOCUMENTS.**

Q2 *GBR Section 7.13.3.2 provides baseline groundwater inflow rates for ungrouted rock in tunnels and shafts. Pre-excavation drilling and grouting are identified in the Bid Form as unit rate items. Please baseline post-grouting inflow rates, since the success of grouting will depend on satisfaction of the Owner's criteria and uncertainties will not be within the Contractor's control.*

A2 **Refer to GBR Sections 8.6.3 and 9.2.2 that cover pre-excavation probing and grouting and reference Specification Section 31 23 20 - PROBING, PRE-EXCAVATION DRILLING, AND GROUTING. The Owner's criteria for post grouting baseline is not expressed in inflow rates, but are specified as general performance criteria as defined in Section 31 23 20 Part 1.7.B: "…Grouting shall be performed to achieve shaft and tunnel excavations that are safe and allow for placement of concrete/final linings, and that meet the infiltration criteria and enable the construction water disposal rate to stay within the maximum discharge rate per shaft site as specified in the Contract**

Documents." Please note that the stricken-through wording is amended through Addendum 8, Section A Answer A7 and Addendum 8, Section B Item 4.

Q3 *Partial payment for materials - Specification 01 22 00, 1.8 Partial Payment describes the process to be paid for materials stored prior to being incorporated into the project.*

Paragraph 1.8.A indicates no partial payments for material or equipment delivered to the project will be made unless shop drawings and/or preliminary O&M manuals are approved by the Owner.

Paragraph 1.8.B indicates how partial payments will be made for undelivered, project-specific manufactured or fabricated equipment.

There does not appear to be an avenue for partial payment for materials Contractors elect to purchase early in the project (precast tunnel lining segments, piling, drainage pipe, PVC pipe, etc.) and store them either on or off site to lock pricing. Please confirm how partial payments for materials yet to be incorporated into the project will be made.

A3 **Partial payment for materials will be considered for major items like precast tunnel lining segments.**

Q4 *O14 Existing Flap Gate Remediation Payment - 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." How are contractors paid for these unknown repairs?*

A4 **Inspection and repairs of the existing O14 flap gates shall be reimbursed as part of Specification 01 22 00 Bid Item 92 and as agreed to by the Owner. See Specification Section B, Item 2 - Changes to Contract Documents.**

Q5 *O14 Existing Flap Gate Information - 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." Please provide shop drawings of the existing flap gates in question.*

A5 **See Appendix E – Supplemental Information, Section 5.5.2 for the details of the existing flap gates (also identified as a tide gate on the 48-inch sewer of the Saw Mill Run Diversion Chamber Modifications, Contract 675 documents) on each side of the existing O14 Regulator. Included as Attachment C of this Addendum, O-14 Flap Gate Improvements, pages from Contract 1617 documents for reference being added to Appendix E – Supplemental Information, Section 5.5.4.**

Q6 *Section 31 55 00 Part 3.2.A describes a substantial test program at each location for jet grout ground modification while Part 3.3 does not describe the test program for permeation grouting. Is this test program only required for jet grout ground modification or is it also required for permeation ground modification?*

A6 **Requirements for permeation grouting Trial/Test Program and Post-Production Test Program have been ADDED to Section 31 55 00 Part 1.6.C.8.b and Part 3.3.L. and Part 3.3M. See Section B, Item 3 for Changes to Contract Documents.**

Q7 *Are there flap gates on the existing outfalls at site O14 to prevent river flow into the regulator during any bypass pumping activities?*

A7 **There are two flap gates in the existing O14 regulator.**

Q8 *The GBR Section 7.13.3.2 - Inflow through Rock Mass provides estimates of steady-state tunnel inflows and flush flows at the excavation heading for ungrouted rock masses. Table 7.9 includes Groundwater Inflows – ungrouted tunnels. This table only includes some of the Non-TBM Tunnels.*
Please provide baseline estimates of inflows for the TBM driven tunnels. This is needed so that the Contractor can develop its plans for free air access to the TBM face for maintenance and cutter changes, as well as for planning tunnel dewatering systems.

A8 **It is the Bidders' responsibility to determine the location and frequency for interventions (refer to GBR Section 8.4.1). Results from Packer testing along the alignments are provided in the GDR for the Bidders' additional use in planning intervention locations and estimating the flows. Refer to Addendum 7, Section A Answer A26 and Addendum 7, Section B Item 10 for payment provisions for grouting to facilitate hyperbaric interventions.**

Q9 *Specification 31 23 20 Section 3.6.M.2F states "Drill pre-excavation grout holes in the locations indicated on the Contract Drawings around the circumference of the shaft to the depth drilled (see Part 3.5) Grout each hole in stages from top of rock to bottom of drilled hole."*

Question – Is the Contractor to grout the hole from the bottom of the hole to the top of rock using Ascending Stage Grouting or from the top of rock to the bottom of the hole using Descending Stage Grouting?

A9 **See Specification 31 23 20, Part 3.6.M.2 states "….from top of rock to bottom of drilled hole" which refers to the total depth of rock to be covered by grout injection. It does not necessarily specify the grouting sequence. It is the Contractor's choice to determine the use of Ascending Stage Grouting or Descending Stage Grouting to achieve the most efficient grout injection across the total depth of the drilled hole.**

Q10 *Specification 31 23 20 Section 3.7.A states "At the completion of all grouting, redrill and clean all the grout holes as necessary and fill and seal them with a cement grout having a water to cement ratio of 0.7:1, by weight, or less, in a manner to ensure complete filling of the hole. Apply an appropriate grouting pressure to the hole to affect the final seal as approved by the Owner."*

Question #1 – What Pay Items will the Contractor be compensated under to pay for the cost of the redrilling, cleaning and grouting of each grout hole at the completion of all

grouting?

Question #2 – Does this mean ALL of the grout holes have to be redrilled, cleaned and grouted with the w/c=0.71 grout or does it mean only as "necessary"? What criteria will be used to define "necessary"? Who will make this decision?

A10 **Answer to Question#1: Specification 31 23 20, Part 3.7.C specifies "All work related to hole sealing shall be considered incidental to the Work."**
Answer to Question #2: For the wording "as necessary", refer to this Addendum Answer A27.

Q11 *Specification 31 55 00 Section 2.2.B.7.a states" The Contractor shall provide equipment capable of replacing hardened, non-conforming soil-cement elements."*
The current state of practice of Jet Grouting technology is not capable of eroding hardened soil cement elements. If a situation arises where a jet grout column or portion of the soil-cement mass is non-conforming a supplemental repair plan will need to be employed that may include additional jet grout holes, permeation grouting or other procedure to remediate the soil-cement mass in question. Question – Can the specification be revised to reflect the current state of practice.

A11 **Refer to Addendum 7, Answer A39.**

Q12 *Specification 31 55 00 Section 3.2.A states "Develop and execute at least one (1) trial program at each discontinuous application site."*
Question #1– Does this mean that a trial program consisting of 1ea. pre-trial boring, 5 test columns, 4 post trial borings and 8 core breaks Is required at each of the seven (7) Shaft sites requiring Ground Improvement grouting (i.e. A58, A48, O41, O27, O14, O07 & O06A)?
Question #2 – Why does the specification say … "execute at least one trail program."?
a) Under what circumstances would the Contractor be required to perform more than one trial program per site?
b) Who decides if the Contractor has to perform more than one trial program per site?
c) How will the Contractor be compensated for the costs of additional trial programs beyond the first trial program?

A12 **Answer to Question #1: Trial program shall meet all requirements as stated in Specification 31 55 00, Part 3.2.A.1 through 4.**
Answer to Question #2: If the trial program fails to meet the "Acceptance Criteria" stated in Part 1.7.B.3 and "Tolerance Criteria" stated in Part 1.7.C, and upon Owner's review and discretion, additional trial program may be directed by the Owner at the Contractor's cost. Part 3.2.A.6 has been revised to include this clarification. See Section B, Item 4 for Changes to Contract Documents.

Q13 *Specification 31 55 00 Section 3.2. is related to Jet Grouting and requires a very detailed test program to be performed at each site where jet grouting will be used for Ground Improvement. Each test program requires 1ea. pre-trial boring, 5 test columns, 4 post trial borings and 8 core breaks. This type of trial matches industry standard practices. This*

section also requires a very substantial confirmation boring program for installed production columns.
Specification 31 55 00 Section 3.3. is related to Permeation Grouting. This section does not list any requirements for a test program despite permeation grouting carrying significant risks in achieving the required geometric coverage, strength and permeability. This section also does not list any requirements for confirmation coring and testing of the treated ground mass.
Question – Please revise the specification to include a testing program and post installation confirmation coring and testing at each site where permeation grouting will be used that are as comprehensive as the requirements for the jet grouting.

A13 **Refer to this Addendum Answer A6.**

Q14 *Specification 31 55 00 Section 1.7.B.1.a.3 lists the following requirements for jet grout:*
a) 28 Day Compressive Strength (psi): 200 (minimum).
b) Deformation Modulus (psi): 70,000 (minimum).
c) Permeability (ft/s): 7.0E-06 (maximum).
Specification 31 55 00 Section 1.7.B.2.a.1 list the following requirements for permeation grout:
a) a) 28 Day Compressive Strength (psi): 150 (minimum).
b) Deformation Modulus (psi): 50,000 (minimum).
c) Permeability (ft/s): 7.0E-06 (maximum).
Question - Why is the 28-day compressive strength of the stabilized soil mass created with permeation grouting 50 psi lower than that of the soil cement mass created using jet grouting?

A14 **Strength requirements are set for quality control purposes. Jet grouting typically creates higher strength of grouted soil mass than permeation grouting, therefore a higher strength requirement is set for jet grouting. As stated in Contract Documents, it is Contractor's option to select jet grouting or permeation grouting and design the grout mix based on the geotechnical conditions shown in the GBR/GDR and design requirements stated on the Contract Drawings where ground improvements are shown.**

Q15 *Specification 31 56 00 Section 1.3.D.8 states "Procedures and mix designs for grouting of the toe of the panels to seal the slurry wall/ground interface, where applicable."*
Question - Where on the Drawings does it show the location and quantity of the grout pipes required for grouting the toe of the panels?

A15 **Toe grouting will be a Contractor's option to seal the wall toe where considered applicable by the Contractor to supplement internal shaft grouting during excavation. Refer to Section 31 23 20 Part 3.6.F and Part 3.6.N for additional information.**

Q16 *Specification 31 56 00 Section 3.4.B.2 states "Perform excavation continuously through the slurry, adding slurry as necessary to maintain slurry level from ground surface to the required depth. Excavate in a manner that minimizes movement and loss of ground."*
Specification 31 56 00 Section 3.4.B.4 states "Unless otherwise approved by the Owner,

the excavation of any single panel shall be continuous once excavation has commenced."

Question -Is it 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.

A16 **Yes, for panel excavations at the O27 and AS1 sites only, covered by Specification 31 56 00, Part 3.4.B.2 and 3.4.B.4 (not for the entire SOE system as the RFI suggested).**

Q17 *Drawing ORT– ST-102 shows the bottom of the slurry wall at El. 658.0.*
Drawing ORT– ST- 501 shows the bottom of the slurry wall at El. 668.4.
Question - If a mill is used to excavate the panels, do the bottom of the mill cutting wheels have to reach the bottom of panel elevations listed above or do the centerline of the mill cutting wheels have to reach the bottom of panel elevations listed above?

A17 **These two elevations (one at O27, one at AS1) are the even elevations above which the wall panels are solid without any gaps due to cutting wheel configuration. Therefore, the centerline of the cutting wheels needs to reach these elevations. Refer to Section 31 56 00, Part 3.4.B.6 for requirements.**

Q18 *Specification 31 56 00 Section 3.4.B.8 states "Do not commence excavation of a new panel until the concrete in the adjacent panels has been in place for a minimum of 72 hours and has achieved sufficient strength to withstand the effects of the adjacent excavation."*
Question- The 72-hour limitation seems overly long given successful industry experience on similar projects. Can the 72-hour limitation be reduced to ideally 36 hours or at least to 48-hours?

A18 **The requirement in Specification 31 56 00, Part 3.4.B.8 has been revised to "Do not commence excavation of a new panel until the concrete in the adjacent panels has been in place for a minimum of 72 hours and has achieved sufficient strength to withstand the effects of the adjacent excavation, or as approved by the Owner". See Section B, Item 5 for Changes to Contract Documents.**

Q19 *Specification 31 56 00 Section 3.4.F.7.e states "The reinforcing assembly shall be placed no later than four (4) hours after excavation completion otherwise the Contractor shall restart the sequence at the first step."*
It is often not practically possible to begin reinforcement placement within 4 hours of completing the excavation for multiple reasons including weeks, holiday, weather etc.
Question – Can this requirement be revised to say something like "Begin reinforcement placement as soon as practically possible after completing the excavation"?

A19 **The requirement in Specification 31 56 00, Part 3.4.F.7.e has been revised to "The reinforcing assembly shall be placed no later than four (4) hours after excavation completion otherwise the Contractor shall restart the sequence at the first step, or as approved by the Owner". See Section B, Item 6 for CHANGES TO CONTRACT DOCUMENTS.**

Q20 *Specification 31 56 00 Section 3.4.G.1 states "Begin placing concrete by means of tremie pipe within 12 hours of completing excavation, and within two (2) hours of completion of*

installation of reinforcing in the trench."
It is often not practically possible to tremie concrete placement within 12 hours of completing the excavation for multiple reasons including weeks, holiday,, weather etc.
Question - This requirement as a practical matter means the reinforcing cage and tremie concrete have to be installed / placed in the same day. It would be hard to achieve this even working a 12-hour shift. To avoid working extremely long hours on pour days a process where you place the reinforcing cage the day before the tremie pour and recirculate the bentonite continuously overnight has been successful on many previous projects.
Question - Can this requirement be rewritten to allow placement of tremie concrete to begin within 18 hours after the placement of the reinforcing cage in the trench as long as the bentonite in the trench is continuously recirculated until the tremie pour begins?

A20 **The requirement in Specification 31 56 00, Part 3.4.G.1 has been revised to "Begin placing concrete by means of tremie pipe within 12 hours of completing excavation, or as approved by the Owner, and within two (2) hours of completion of installation of reinforcing**
in the trench. If the two-hour limit is exceeded, remove the reinforcing, clean the reinforcing, re-clean the excavation bottom, and re-install the reinforcing". See Section B, Item 7 for CHANGES TO CONTRACT DOCUMENTS.

Q21 *Drawing ORT– ST-101 Note #1 and Drawing ORT-ST-500 Note #1 both state "Primary and secondary slurry panels shown for reference. Guide wall configuration and slurry wall panels layout (including joint types) are to be defined by contractor based on equipment selection and in accordance with the contract documents."*
Question - If the Contractor uses a panel configuration different from that shown on Drawings ORT-ST 101 & or ORT-ST -500 is the Owner still responsible for the design and performance of the Slurry Wall if concrete and reinforcing steel are unchanged?

A21 **No.**

Q22 *Specification 03 30 00 Section 1.2.A states "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."*
Question – Please confirm that Slurry Wall panels (i.e. approx. 22 feet long x approx. 4 feet wide x 65 feet deep) and Secant Piles, both of which are temporary SOE elements, are not considered mass concrete and do not require a Thermal Control Plan (TCP) or any other measures and restrictions related to mass concrete pouring, curing, testing, etc.

A22 **Confirmed. Slurry walls and secant piles are not to be considered permanent structures.**

Q23 *Cast-In-Place Concrete – Concrete Properties*
Specification 03 30 00 Section 2.1.A - Footnote 4 states " Limit air content in 4 to 7 percent range." This applies to Class E Concrete for:
• Slurry wall shafts
• Secondary secant piles in non-circular shaped support of excavations

• Interlocking Pipe Pile (IPP) infill concrete
• Foundation H-pie rock socket backfill.
Specification 03 30 00 Section 2.1.A -Footnote 5 states " Slump shall be 8 to 9 inches. " This applies to Class C, D & E Concrete for:
• All secant piles (primary and secondary) in circular-shaped shaft support of excavations
• Primary secant piles in non-circular shaped support of excavations
• Guide Walls for slurry walls and secant pile walls.
• Slurry wall shafts
• Secondary secant piles in non-circular shaped support of excavations
• Interlocking Pipe Pile (IPP) infill concrete
• Foundation H-pie rock socket backfill.
Specification 03 30 00 Section 2.1.D states "All exterior concrete and concrete exposed to process fluids shall be air-entrained with an air content of 6 percent + 1 percent by volume."
Specification 03 30 00 Section 2.1.F states "Concrete with superplasticizer shall be designed for a final slump of 4 to 8 inches."
The current industry practice for tremie concrete mixes is:
• concrete slumps that are greater than 9" (and sometimes much greater than 9") and
• No air entrainment
Question – Can the above requirements be revised to tremie concrete mix deigns, including slump and air requirements, for Slurry Wall, Secant Piles and Interlocking Pipe Piles to be per Contractor means and methods for proper placement and consolidation of the elements?

A23 **Footnote 4: No changes to be made during the bidding process.**
Footnote 5: No changes to be made during the bidding process.
Specification 03 30 00 Section 2.1.D - CHANGED to "N/A".
Specification 03 30 00 Section 2.1.F - Refer to this Addendum Answer A38.
See Section B, Item 8 for CHANGES TO CONTRACT DOCUMENTS
.

Q24 *Specification 03 20 00 Section 3.8.A.1 states "Where no reinforcement is shown on the Contract Drawings, the minimum cross-sectional area of horizontal and vertical reinforcement in walls shall comply with ACI 318 Chapter 14 provisions for drop shafts and tunnels and ACI 350 for near surface structures."*
The Drawings show the secant piles for Shafts A58, A48, O41, O14, O07 & O06A as being unreinforced. Question – Please confirm that the above requirement does not apply to the unreinforced secant piles for A58, A48, O41, O14, O07 & O06A.

A24 **Confirmed. Secant piles are not designed to ACI 350.**

Q25 *Specification 31 23 20 Section 2.2.A states "Unless specified otherwise, use Portland Cement or Ultrafine Cement (Type I/II) conforming ASTM Cl 50, or Portland Limestone Cement (Type IL) conforming to ASTM C595."*
And Specification 31 23 20 Section 2.2.F states "Proportion a high early strength stable cement grout mix, with anti-washout agent, as appropriate for the particular application."
Question – Proportioning a high early strength stable cement mix implies the use of

Portland Type III cement, but Type III cement is not listed in Section 2.2.A for use. Please clarify the intent of the wording in Section 2.2.F. Will use of Type III cement be allowed as needed to achieve a high early strength stable grout mix?

A25 **Specification 31 23 20, Part 2.2.F is revised to "Proportion a high early strength stable cement grout mix using Type III cement conforming to ASTM C150 or approved acceleration admixture, with anti-washout agent, as appropriate for locations deemed to require early grout strength setting by the Contractor". See Section B, Item 9 for Specification 31 23 20 CHANGES TO CONTRACT DOCUMENTS.**

Q26 *Specification 31 23 20 Section 3.6.I states "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 – This section implies that grouting shall be done in a downstage method, but other sections of the specification describe and allow upstage grouting. Under an upstage grouting scenario, will it still be necessary to allow every stage in a borehole to reach gel or set time prior to moving the packer and hitting subsequent stages above? If so, this would imply only grouting one stage of the grout hole per shift.

A26 **Refer to this Addendum Answer A9. Requirement for reaching gel or set time prior to moving to next stage does not change for either downstage or upstage grouting.**

Q27 *Specification 31 23 20 Section 3.7.A states "At the completion of all grouting, redrill and clean all the grout holes as necessary and fill and seal them with a cement grout having a water to cement ratio of 0.7:1, by weight, or less, in a manner to ensure complete filling of the hole. Apply an appropriate grouting pressure to the hole to affect the final seal as approved by the Owner."*
Question – Typically, grout holes are pressure grouted up to the bottom of the standpipe. Upon completion of pressure grouting the remainder of the hole if backfilled with a neat cement grout. Please confirm that it is not necessary to re-drill the extent of hole that has already been pressure grouted and that it would be sufficient to clean the grout hole from the top of the final grout stage.

A27 **Confirmed. The use of the wording "as necessary" refers to a grouting sequence where the grout holes are not yet backfilled with grout.**

Q28 *Specification 31 55 00 Section 3.2.C.2 states "3.2.C.2 Interrupt core sampling during the advancement of each boring to permit the performance of packer permeability tests (or other Owner-approved in situ methods) according to the procedures specified herein."*

Question – The section states to interrupt core sampling to conduct packer permeability testing but does not provide details on the frequency or length of the tests – please provide.

A28 **Specification 31 55 00, Part 3.2.C.2 REVISED to include length of tests. Contractor shall determine the arrangement of packer permeability testing to verify permeability**

as part of its submittal for Work Plan / Quality Control Plan specified in Part 1.6.C.7. a. & c. See Section B, Item 10, for CHANGES TO CONTRACT DOCUMENTS.

Q29 *Specification 31 55 00 Section 3.2.H.6 states "Refusal Criteria: In general, grouting for any stage with any grout mix shall be considered complete when the rate of injection, at the maximum pressure, is less than 1/2 gallon of liquid grout for 10 minutes.*

Question – In permeation grouting, depending on geometry and design, it is also common to have a max volumetric refusal criteria. Please provide a maximum injected grout volume criteria and revise the specification language to include either/or language.

A29 **Volumetric criteria added to Section 31 55 00 Part 3.2.H.6. See Section B, Item 11, for Changes to Contract Documents.**

Q30 *Support of Excavation Design Calculations - Reference is made to Section 1.6-B Design Calculations of the following specification sections: 31 41 16 - Steel Sheet Piling and Cofferdam Construction, 31 57 00 - Secant Pile Wall, and 31 56 00 - Slurry Wall. Section 1.6-B of the referenced sections indicate that design calculations are to be submitted for Contractor-Alternate Equivalent designs or designs that are modified from those shown on the Contract Documents for Shaft and Near Surface Facility Structures. However, Section 1.6-D of Specification Section 31 41 00 - Near Surface Facility Construction states to submit verification calculations in addition to any redesign calculations. Please advise if design calculations are to be submitted if the Contractor intends to construct the SOE systems as shown in the Contract Documents.*

A30 **Yes – calculations are required. As stated in the notes on Contract Drawings pertaining to NSF SOEs at each site, "The location, depth, and dimensions of the existing brick (or concrete) sewer(s) are approximate as shown. The Contractor shall employ the appropriate means and methods to field verify these elements and locate the existing sewer between the secant pile crossings prior to the development of shop drawings." For bid purposes:**

- **Expect that the contract SOE designs will require modification due to actual field conditions for all NSF structures (regulators, outfalls, and retaining walls). Include the expected design revision effort (as described in Section 01 22 00 Part 3.1.F) in the BID ITEM pertaining to NSF SOEs at each site (e.g., BID ITEM 73. Regulator ORT-O27-RG at Site ORT-O27).**
- **Bid the NSF SOE construction as shown on the Contract Documents for each site including all contract design elements and elements to be designed by the Contractor as specified in the Contract Documents.**
- **If exposed field conditions permit the contract designs to be implemented without revisions, then no verification calculations of the SOE structural components shown on the Contract Drawings are required provided all requirements and exclusions shown in the Contract Documents are met, and Contractor's construction loadings fall within the contract design loads specified in Section 31 41 00 Part 1.7.A.2. Otherwise, verification calculations are required as stated in Part 1.7.A.4. The**

Contractor must submit Shop Drawings and all other required calculations and submittals in accordance with Section 31 41 00 Part 1.6.

Q31 *Specification Section 31 23 20 - Probing, Pre-Excavation Drilling, and Grouting Section 3.5.D states the following regarding the Vertical Drilling for Shaft External Pre-Excavation Grouting "Drill inside of the casing and into rock to a minimum depth of 10 feet below the maximum depth of planned shaft excavation as shown on the Contract Drawings". Section 3.6.M regarding Shaft External Pre-Excavation Grouting states: "Grout each hole in stages from top of rock to bottom of drilled hole".*
Section 3.5.D indicates that the holes in rock are to be drilled full depth from top of rock to the maximum depth, leading one to think that the intent would be to then grout from the bottom-up in ascending stages . However, 3.6.M seems to imply that grouting will be performed in descending stages from the top of rock to the bottom of the hole. Please clarify.

A31 **Refer to this Addendum Answer A9.**

Q32 *Do the steady state flows in GBR table 7.10 include flush flows?*

A32 **No; GBR Table 7.10 provides ungrouted steady-state inflows for each shaft.**

Q33 *Bid Item 30: Non-TBM Tunnel and Adit Pre-Excavation Grouting - Drilling Pay Item ---*
Specification Section 01 22 00 for Bid Item 30 indicates that the drilling for non-TBM tunnel and adit pre-excavation grouting is incidental to
Bid Item 30 which is "Non-TBM Tunnels Pre-Excavation Grouting, Excluding Grout Materials" which is paid by the hour. If drilling for pre-
excavation grouting is incidental to the hourly grouting pay item, this will place undue risk on both the Contractor and the Owner. This places
undue risk on the Contractor because all of the cost associated with drilling may not be recuperated if the grouting effort is minimal.
Conversely, if the grouting effort is greater than expected, the Owner will pay for drilling that was not performed.

Similar to the Pre-Excavation Grouting at each shaft site, please add a bid item to drill for the Pre-Excavation grouting program (with a unit of
measure of LF) for the Non-TBM Tunnel and Adit Pre-Excavation grouting.

A33 **No changes will be considered during the bidding process.**

Q34 *Please confirm that the production pull out tests referenced in 3.3.A.10.b are only required for the 10 elements per structure referenced in 3.3.A.10.a and NOT for all production dowels.*

A34 **Section 31 72 13 Part 3.3.A.10 has been REVISED to reflect a new set of production dowel pull out test requirements. See Section B, Item 12 for CHANGES TO CONTRACT DOCUMENTS.**

Q35 *SECTION 03 20 00 CONCRETE REINFORCING 1.5 QUALIFICATION C. requires "Installer: Trained and certified by Manufacturer." In what scenario would a manufacturer need to train and certify an installer?*

A35 **Section 03 20 00 Part 1.5.C requirement has been REVISED. See Section B, Item 13 for CHANGES TO CONTRACT DOCUMENTS.**

Q36 *SECTION 03 25 00 CONCRETE JOINTS AND ACCESSORIES 3.4 INSTALLATION OF CONSTRUCTION JOINTS B.8. states "In liquid containment structures, wait three days before placing concrete in adjacent slab and wall sections." What structures are considered liquid containment structures? Is this requirement project wide or is this for something like chemical containment?*

A36 **Section 03 25 00 Part 3.4.B.8 has been DELETED. See Section B, Item 14 for Changes to Contract Documents.**

Q37 *The concrete specifications temperature ranges for hot and cold weather concrete meet or are more stringent than ACI and should be sufficient for all weather pouring. Can the section below be waived or deleted by following the currently specified requirements?*
3.5CONCRETE WORK IN HOT OR COLD WEATHER
E. Minimum Time Between Adjacent Placements:
1.Construction Joints: Six (6) days.
2.Contraction Joints: Six (6) days.
3.Expansion Joints: One (1) day
If the above requirement can't be waived or deleted, is this requirement project wide or are there specific locations where it applies?

A37 **Section 03 30 00 Part 3.5.A has been REVISED and Section 03 30 00 Part 3.5.E has been REVISED. See Section B, Item 15 for Changes to Contract Documents.**

Q38 *Could concrete with superplasticizer be designed for a final slump of 4 to 9 inches instead of 03300 2.1.F "4 to 8-inch" slump?*

A38 **Yes. See Section B, Item 16 for Changes to Contract Documents.**

Q39 *Please delete the phrase ", subject to the controlling provisions of the Contract, including the GBR's own terms" from the definition of the GBR as reliance on the GBR should be unqualified.*

No changes to the Contact Documents will be made.

B. CHANGES TO CONTRACT DOCUMENTS

1. APPENDIX C – GEOTECHNICAL BASELINE REPORT – Section 7.8.8 Class 7 – Interbedded Sedimentary Rock has been REVISED and Table 7.3 Class 7 Interbedded Sedimentary Rock Percentages has been REVISED as follows; GBR page 20 of 44 (CHANGES ARE NOTED IN RED):

   7.8.8 Class 7 – Interbedded Sedimentary Rock

   As introduced in Section 7.2, the stratigraphic profiles distinguish a seventh class called Interbedded Sedimentary Rock. The second column of Table 7.3 presents the relative proportions of the six other rock classes that comprise Class 7 Interbedded Sedimentary Rock. These proportions are averaged for all Class 7 rock over the Project alignment; local conditions will contain differing proportions, including being entirely within one classification, with a maximum full-face length as baselined in Column 3 of Table 7.3Table 7.3.

   Table 7.3: Class 7 Interbedded Sedimentary Rock Percentages

Rock Class	Percentage	Maximum Full-Face Length (within Class 7)
Class 1 Sandstone	35%	500 feet
Class 2 Siltstone	55%	1,500 feet
Class 3 Shale	5%	200 feet
Class 4 Claystone, Class 5 Limestone, Class 6 Coal	5%	None

2. APPENDIX A – TECHNICAL SPECIFICATIONS – Section 01 22 00, Bid Item 92. REVISE BID ITEM 92. Site Work and Restoration at Site SMRT-014, Section 2.

   a. REVISE Bid Item 92 as follows (CHANGES ARE NOTED IN RED):

   2. This item shall include compensation for all utility relocations, reconstructions and flow diversions, inspection/repair/modification of the existing regulator and the flap gate inside, including but not limited to:

      a. Provisions of all items in Part 3.1.R – Installation of Pipe in Open Trench of this Section.
      b. Provision of furnishing and installation of waterproof/sealed and lockable manhole frames, covers, access hatches, as well as manhole rungs and ladder-ups, as shown on the Contract Documents.
      c. Upon completion of flap gate inspection, Contractor to submit repair plan and estimate to the Owner for approval prior to repairs.

3. APPENDIX A – TECHNICAL SPECIFICATIONS – Section 31 55 00. Part 1 – GENERAL, 1.6.C.8.b.1) and Part 3 – EXECUTION, 3.3.L. and 3.3.M.

    a. REVISE Section 31 55 00, Part 1.6.C.8.b.1) as follows (CHANGES ARE NOTED IN RED):

        1) Records of trial/test programs. Requirements of trial/test programs shall be as described in Part 3.2.A and as applicable to Permeation Grouting.

    b. ADD the following text in its entirety to Section 31 55 00 - Part 3.3.L and 3.3.M as follows (CHANGES ARE NOTED IN RED):

        L. Post-Permeation Grouting Exploratory Boreholes: The Contractor shall perform post-permeation grouting borings as described in Part 3.2.C and as applicable to permeation grouting.
        M. Laboratory Testing: The Contractor shall perform post-permeation grouting laboratory testing as described in Part 3.2.D and as applicable to permeation grouting.

4. APPENDIX A – TECHNICAL SPECIFICAIONS 31 55 00, Part 3 – EXECUTION, 3.2.A.6

    a. REVISE Section 31 55 00, Part 3.2.A.6 as follows (CHANGES ARE NOTED IN RED):

        6. Subject to the results of the trial programs, the Owner may direct the Contractor to perform additional trial testing if the results fail to meet the strength and permeability Acceptance Criteria stated in Part 1.7.B.3 and Tolerance Criteria stated in Part 1.7.C; or the Owner may require the Contractor to develop modifications to the proposed production jet grouting procedures to achieve satisfactory results, all at Contractor's own cost.

5. APPENDIX A – TECHNICAL SPECIFICATIONS 31 56 00, Part 3 – EXECUTION, 3.4.B.8

    a. REVISE the following text in its entirety to Section 31 56 00, Part 3.4.B.8 as follows (CHANGES ARE NOTED IN RED):

        8. Do not commence excavation of a new panel until the concrete in the adjacent panels has been in place for a minimum of 72 hours and has achieved sufficient strength to withstand the effects of the adjacent excavation, or as approved by the Owner.

6. APPENDIX A – TECHNICAL SPECTIFICATIONS - Section 31 56 00, Part 3 – EXECUTION, 3.4.F.7.e.

    a. REVISE the following text in its entirety to Section 31 56 00, Part 3.4.F.7.e. as follows (CHANGES ARE NOTED IN RED):

        e. The reinforcing assembly shall be placed no later than four (4) hours after excavation completion otherwise the Contractor shall restart the sequence at the first step, or as approved by the Owner.

7. APPENDIX A – TECHNICAL SPECIFICATIONS, Section 31 56 00, Part 3 – EXECUTION, 3.4.G.1.

    a. REVISE the following text in its entirety to Section 31 56 00, Part 3.4.G.1. as follows (CHANGES ARE NOTED IN RED):

        1. Begin placing concrete by means of tremie pipe within 12 hours of completing excavation, or as approved by the Owner, and within two (2) hours of completion of installation of reinforcing in the trench. If the two-hour limit is exceeded, remove the reinforcing, clean the reinforcing, re-clean the excavation bottom, and re-install the reinforcing.

8. APPENDIX A – TECHNICAL SPECIFICATIONS, Section 03 30 00, Part 2 – PRODUCTS, 2.1.D.

    a. DELETE Section 03 30 00, Part 2.1.D. in its entirety and REPLACE Section 03 30 00, Part 2.1.D. with the following text in its entirety as follows (CHANGES ARE NOTED IN RED):

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

9. APPENDIX A – TECHNICAL SPECIFICATIONS, Section 31 23 20, Part 2 – PRODUCTS, 2.2.F.

    a. REVISE the following text in its entirety to Section 31 23 20, Part 2.2.F. as follows (CHANGES ARE NOTED IN RED):

        F. Proportion a high early strength stable cement grout mix using Type III cement conforming to ASTM C150 or approved acceleration admixture, with anti-washout agent, as appropriate for ~~the particular application~~ locations deemed to require early strength setting by the Contractor.

10. APPENDIX A – TECHNCIAL SPECIFICATIONS, Section 31 55 00, Part 3 – EXECUTION, 3.2.C.2.

    a. REVISE the following text in its entirety to Section 31 55 00, Part 3.2.C.2. as follows (CHANGES ARE NOTED IN RED):

        2. Interrupt core sampling during the advancement of each boring to permit the performance of packer permeability tests (or other Owner-approved in situ methods) in 10 feet length stages below the groundwater table at the test site or as agreed to with the Owner according to the procedures specified herein.

11. APPENDIX A – TECHNCIAL SPECIFICATIONS, Section 31 55 00, Part 3 – EXECUTION, 3.3.H.6.

    a. **REVISE the following text in its entirety to Section 31 55 00, Part 3.3.H.6. as follows (CHANGES ARE NOTED IN RED):**

        6. Refusal Criteria: In general, grouting for any phase or stage with any grout mix shall be considered complete when the rate of injection, at the maximum pressure, is less than 1/2 gallon of liquid grout for 10 minutes, or when the volumetric refusal (VR) criteria calculated by the following formula is reached: $VR=0.785x(S+D)^2xHxn$, where S=injection pipe center spacing; D=injection column diameter overlap; H=injection port spacing along pipe; and n=soil porosity (%). The Contractor shall determine these parameters based on the proposed permeation grout plan and include a waste factor of 10%. The Contractor shall determine which criteria to use for any phase or stage to achieve the Design and Acceptance Criteria shown in Part 1.7.B.2 and B.3 and on Contract Drawings.

12. APPENDIX A – TECHNCIAL SPECIFICATIONS, Section 31 72 13, Part 3 – EXECUTION, 3.3.A.10.

    a. DELETE the following text in its entirety Section 31 72 13, Part 3.3.A.10.a. and Part 3.3.A.10.b. ADD the following text in its entirety to Section 31 55 00, Parts 3.3.A.10.a. and 3.3.A.10.b. and ADD Section 31 55 00, Part 3.3.A.10.c. in its entirety as follows (CHANGES ARE NOTED IN RED):

        a. ~~The Owner will randomly designate production rock dowels and bolts for pullout testing in the shafts and other areas where rock dowels are installed, such as starter tunnel/tail tunnel, shaft-to-tunnel adits, etc. The Contractor should assume that at least 10 elements will be tested for each shaft and structure excavation, up to 10 elements for each starter/tail tunnel, and up to 10 elements for each adit. Should a high~~

~~failure rate occur, this amount will be increased until the dowels can be shown to be meeting required parameters to the satisfaction of the Owner.~~ The Owner will designate production rock dowels for pullout testing in the shafts and non-TBM tunnels, with the following minimum quantities – for all shafts, SMRT and CCT-O06A-AD: 4% of total installed dowels; for all other non-TBM tunnels: 6% of total installed dowels. The selection of test locations will be made as uniformly distributed as practical across the circumference of tunnel or shaft, and along tunnel length or shaft depth. For non-TBM tunnels, at least 50% of the selected test dowels shall be nearest to the crown. The Contractor shall coordinate with the Owner to agree on the test schedule for each tunnel or shaft.

b. ~~Each rock dowel installed shall withstand a minimum force of 18 kips (fiberglass) and 20 kips (steel), applied in four (4) equal increments, with a movement of less than 0.50 inches. Failure shall be considered as any element not sustaining the aforementioned force for a 10-minute hold period and moving outward beyond the aforementioned movement criteria.~~ For any five consecutive tests that fully meet the test criteria in 10.c, test quantity/frequency can be reduced by 25% of remaining quantity at Owner's approval. For any one failed test, two additional tests shall be conducted at no additional cost to the Owner until satisfactory results meeting the criteria in 10.c are achieved. Replace each failed test dowel with newly installed dowel in immediate vicinity or as approved by the Owner and tested to the same criteria.

c. Each steel rock dowel tested shall withstand a minimum pull force of 20 kips for No. 8 dowels and 25 kips for No. 9 dowels, and each fiberglass dowel tested shall withstand a minimum force of 18 kips. All test loads shall be applied in four (4) equal increments, with a movement of not exceeding 0.50 inch at full tested load. Failure shall be considered as any element not sustaining the minimum test load for a 10-minute hold period or moving outward beyond the above movement criteria.

13. APPENDIX A – TECHNICAL SPECIFICATIONS, Section 03 20 00, Part 1 – GENERAL, 1.5.C.

a. DELETE the following in its entirety from Section 03 20 00, Part 1.5.C. and ADD in its entirety the following text to Section 03 20 00, Part 1.5.C.

C. Installer: ~~Trained and certified by Manufacturer.~~ A minimum of 5 years of experience on construction projects of comparable size and construction.

14. APPENDIX A – TECHNCIAL SPECIFICATIONS, Section 03 25 00, Part 3 – EXECUTION, 3.4.B.8.

    a. **DELETE in its entirety Section 03 25 00, Part 3.4.B.8. as follows (CHANGES ARE NOTED IN RED):**

        ~~8. In liquid containment structures, wait three days before placing concrete in adjacent slab and wall sections.~~

15. APPENDIX A – TECHNCIAL SPECIFICATIONS, Section 03 30 00, Part 3 – EXECUTION, 3.5.A. AND 3.5.E.

    a. **REVISE the following text in its entirety to Section 03 30 00, Part 3.5.A. as follows (CHANGES ARE NOTED IN RED):**

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

    b. **REVISE the following text in its entirety to Section 03 30 00, Part 3.5.E as follows (CHANGES ARE NOTED IN RED):**

        E. ~~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.~~

16. APPENDIX A – TECHNICAL SPECIFICATIONS, Section 03 30 00, Part 2 – PRODUCTS, 2.1.F.

    a. **REVISE the following text to Section 03 30 00, Part 2.1.F as follows (CHANGES ARE NOTED IN RED):**

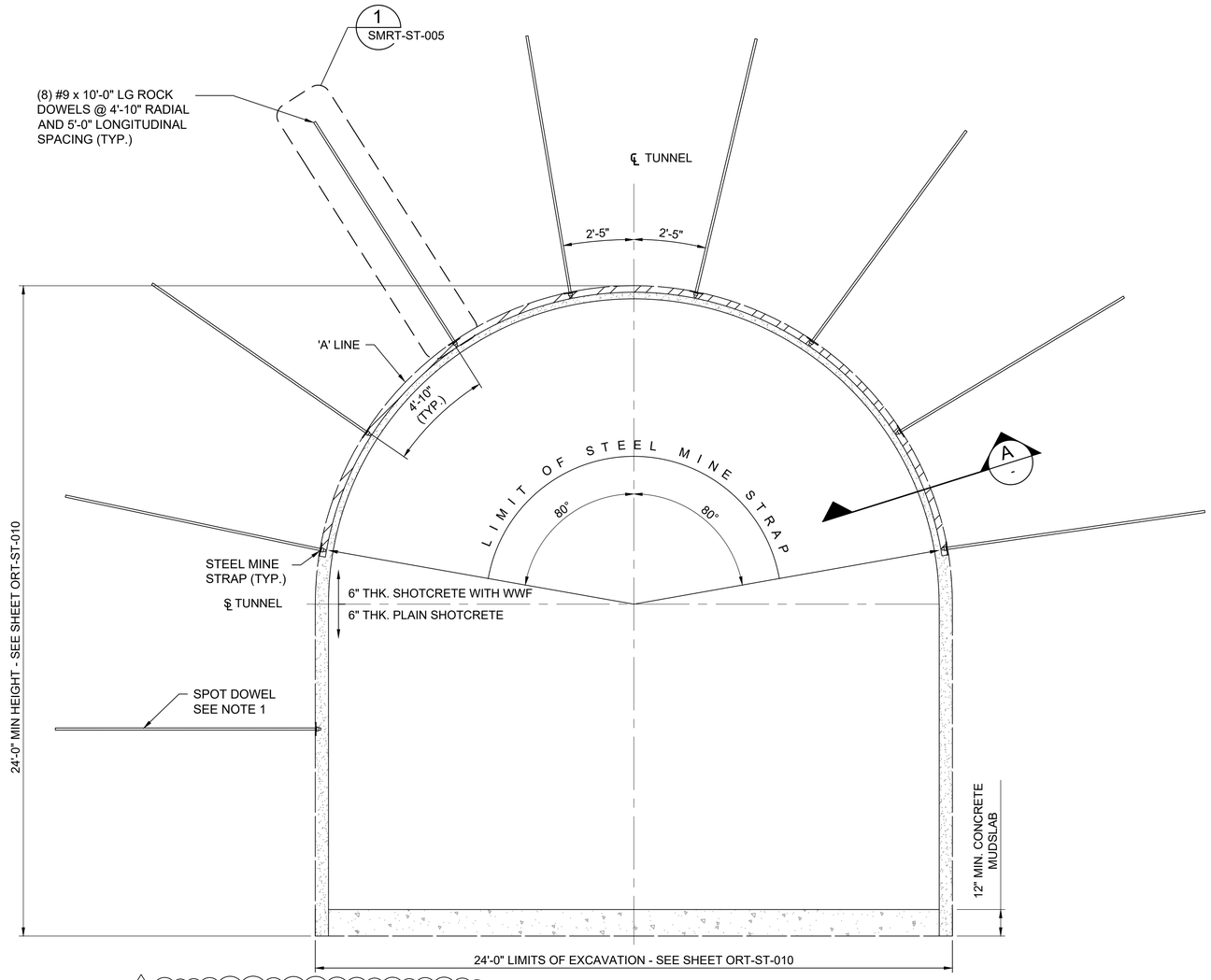
        F. Concrete with superplasticizer shall be designed for a final slump of 4 to ~~8~~ 9 inches.

17. APPENDIX B – CONTRACT DRAWINGS
    a. DELETE ORT-ST-011 (Sheet 079 of 770) and ADD REVISED ORT-ST-011 (Sheet 079 of 770) which is Attachment A to this Addendum.
    b. DELETE CCT-ST-011 (Sheet 092 0f 770) and ADD REVISED CCT-ST-011 (Sheet 092 of 770) which is Attachment A to this Addendum.
    c. DELETE SMRT-ST-002 (Sheet 095 of 770) and ADD REVISED SMRT-ST-002 (Sheet 095 of 770) which is Attachment A to this Addendum.

Addendum No. 9

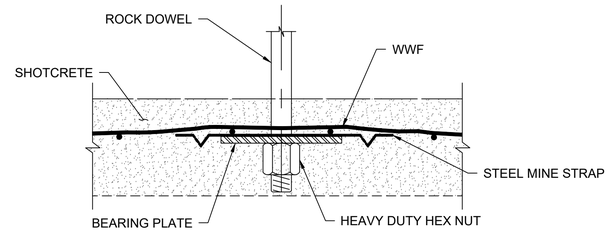
Attachment A – CONTRACT DRAWINGS

- Revised ORT-ST-011 (Sheet 79 of 770) (1 page)
- Revised CCT-ST-011 (Sheet 92 of 770) (1 page)
- Revised SMRT-ST-002 (Sheet 95 of 770) (1 page)



1 ORT STARTER TUNNEL AND TAIL TUNNEL INITIAL SUPPORT TYPE 1 — 1 -

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

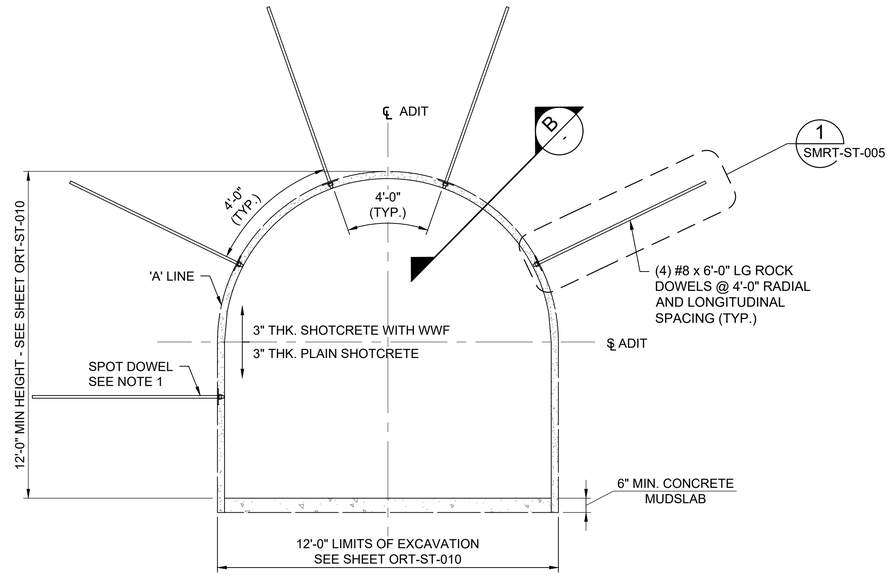


ROCK DOWEL AND STEEL MINE STRAP SUPPORT SECTION — A -

SCALE: NTS

NOTES

1. THE CONTRACTOR SHALL INSTALL SPOT ROCK DOWELS, ADDITIONAL WELDED WIRE FABRIC, SHOTCRETE, AND MINE STRAPS WHERE NECESSARY.
2. ALL STRUCTURAL STEEL SHALL CONFORM TO THE STANDARDS REQUIRED IN THE TECHNICAL SPECIFICATIONS.
3. ALL ROCK DOWELS SHALL BE INSTALLED AS SPECIFIED.
4. ALL WELDED WIRE FABRIC SHALL BE 4"x4"- W2.0xW2.0.
5. ALL ROCK DOWEL LENGTHS SHOWN ARE MINIMUM EMBEDDED LENGTH IN ROCK. ADDITIONAL DOWEL BAR LENGTH SHALL BE PROVIDED FOR NUT AND BEARING PLATE CONNECTION.
6. ALL ROCK DOWELS SHALL BE FULLY ENCAPSULATED WITH NON-SHRINK RESIN GROUT OVER THE ENTIRE EMBEDDED LENGTH. SEE TECHNICAL SPECIFICATIONS FOR DETAILS.
7. PROBING AND GROUTING IS REQUIRED AT THE TUNNEL FACE FOR GROUNDWATER CONTROL PRIOR TO TUNNEL EXCAVATION. REFER TO SHEET SMRT-ST-004 FOR FURTHER DETAILS.
8. REFER TO SHEETS ORT-TP-018 AND ORT-TP-019 FOR MINIMUM REQUIRED LENGTH OF STARTER AND TAIL TUNNELS.
9. CONTRACTOR IS RESPONSIBLE FOR PROVIDING A COMPLETE SYSTEM FOR LAUNCH OF THE TBM THAT ALLOWS FULL DEVELOPMENT OF TBM FACE PRESSURES AND PREVENTS MIGRATION OF GROUNDWATER DURING LAUNCHING OPERATIONS. TBM LAUNCH SYSTEM, INCLUDING ANY SUPPLEMENTARY MEASURES NOT SHOWN ON THIS DRAWING, SHALL BE DESIGNED AND INSTALLED BY THE CONTRACTOR.
10. INSTALL 1" DIA. WEEP HOLES IN SHOTCRETE AT LOCATIONS OF FLOWING WATER IN ROCK SURFACE AND AT DAMP PATCHES IN SHOTCRETE.
11. EXCAVATION AND OVERBREAK BEYOND EXCAVATION LINE ('A' LINE) SHALL BE BACKFILLED WITH CONCRETE OR SHOTCRETE.
12. SEE SPECIFICATION SECTION 31 71 01 FOR REQUIREMENTS OF INITIAL SUPPORT ELEMENTS WITH RESPECT TO THE 'B' LINE.
13. SUPPORT FOR TEMPORARY ENLARGEMENTS OR STARTER AND TAIL TUNNEL ENDWALL THAT MAY BE REQUIRED BY THE CONTRACTOR NOT SHOWN. CONTRACTOR SHALL DESIGN ANY ADDITIONAL SUPPORT IN ACCORDANCE TO THE TECHNICAL SPECIFICATIONS.
14. SOME SECTIONS OF THE TUNNELS AND ADITS SHOWN IN THIS SHEET WILL REQUIRE THE USE OF STEEL RIBS AND TIMBER LAGGING FOR INITIAL ROCK SUPPORT (I.E., TYPE 2 SUPPORT). CONTRACTOR SHALL FABRICATE THE STEEL RIBS AND HAVE THEM AVAILABLE ON-SITE DURING TUNNEL CONSTRUCTION. REFER TO SHEET SMRT-ST-004 AND SPECIFICATION SECTION 31 72 00 FOR FURTHER DETAILS.
15. TUNNEL EXCAVATION WIDTH AND HEIGHT MODIFICATIONS SHALL BE DESIGNED BY THE CONTRACTOR TO SUIT MEANS AND METHODS, ALL GROUND SUPPORT AND OTHER WORK ASSOCIATED WITH INCREASED TUNNEL EXCAVATION SIZE SHALL BE DESIGNED AND PERFORMED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER FOR THE MODIFICATION AND ALL ASSOCIATED IMPACTS TO THE WORK.



A48 ADIT, A58 ADIT, AND DWT INITIAL SUPPORT TYPE 1 — 2 -

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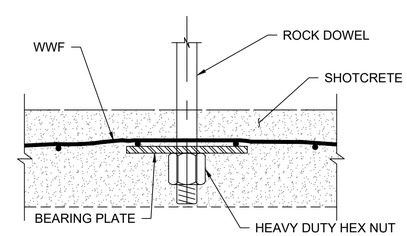

ROCK DOWEL SUPPORT SECTION — B -

SCALE: NTS

Designed by:	REVISION			
ANC	REV No.	DATE	DESCRIPTION	APPV
Drawn by:	1	12/08/25	REVISION FOR ADDENDUM 9	ZC
RGR				
Checked by:				
DJP				

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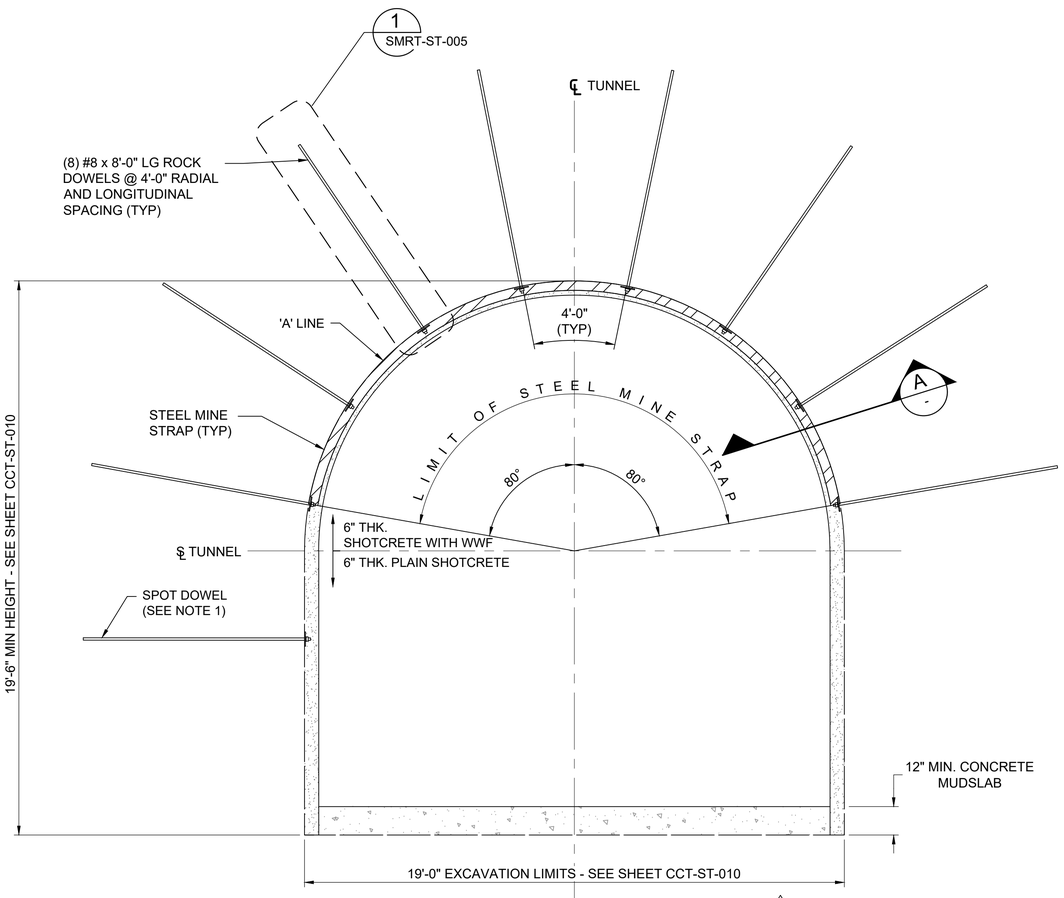
ALLEGHENY COUNTY SANITARY AUTHORITY (ALCOSAN)
OHIO RIVER TUNNEL (ORT)

ORT-ST-011
NON-TBM TUNNEL INITIAL SUPPORT - TYPE 1
TUNNEL DETAILS SHEET 2 OF 4

Contract: 1797
File: ORT-ST-011.dwg
Date: 07/30/2025
Sheet: 079 OF 770

FILE NAME:C:\Users\PLE92466\DC\ACCDocs\Mott MacDonald\507105621 - ALCOSAN Ohio River Tunnel Design - T&MI\Project Files\1 - ORT\05-Structural\Sheets - ORT-ST-011 LAST SAVED BY: PLE92466 PLOT DATE:12/8/2025 11:52:34 AM



CCT STARTER TUNNEL AND STUB TUNNEL (AT CCT-O07-AS) INITIAL SUPPORT TYPE 1

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

1 -

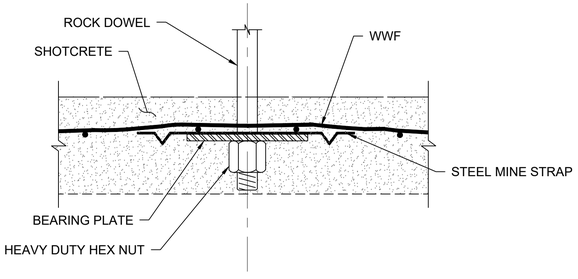
NOTES

1. THE CONTRACTOR SHALL INSTALL SPOT ROCK DOWELS, ADDITIONAL WELDED WIRE FABRIC, SHOTCRETE, AND MINE STRAPS WHERE NECESSARY.
2. ALL STRUCTURAL STEEL SHALL CONFORM TO THE STANDARDS REQUIRED IN THE TECHNICAL SPECIFICATIONS.
3. ALL ROCK DOWELS SHALL BE INSTALLED AS SPECIFIED.
4. ALL WELDED WIRE FABRIC SHALL BE 4"x4"- W2.0xW2.0.
5. ALL ROCK DOWEL LENGTHS SHOWN ARE MINIMUM EMBEDDED LENGTH IN ROCK. ADDITIONAL DOWEL BAR LENGTH SHALL BE PROVIDED FOR NUT AND BEARING PLATE CONNECTION.
6. ALL ROCK DOWELS SHALL BE FULLY ENCAPSULATED WITH NON-SHRINK RESIN GROUT OVER THE ENTIRE EMBEDDED LENGTH. SEE TECHNICAL SPECIFICATIONS FOR DETAILS.
7. PROBING AND GROUTING IS REQUIRED AT THE TUNNEL FACE FOR GROUNDWATER CONTROL PRIOR TO TUNNEL EXCAVATION. REFER TO SHEET SMRT-ST-004 FOR FURTHER DETAILS.
8. LENGTH OF CCT STARTER TUNNEL (IF REQUIRED) TO BE CONFIRMED BY CONTRACTOR.
9. CONTRACTOR IS RESPONSIBLE FOR PROVIDING A COMPLETE SYSTEM FOR LAUNCH OF THE CCT TBM THAT ALLOWS FULL DEVELOPMENT OF TBM FACE PRESSURES AND PREVENTS MIGRATION OF GROUNDWATER DURING LAUNCHING OPERATIONS. TBM LAUNCH SYSTEM, INCLUDING ANY SUPPLEMENTARY MEASURES NOT SHOWN ON THIS DRAWING, SHALL BE DESIGNED AND INSTALLED BY THE CONTRACTOR.
10. INSTALL 1" DIA. WEEP HOLES IN SHOTCRETE AT LOCATIONS OF FLOWING WATER IN ROCK SURFACE AND AT DAMP PATCHES IN SHOTCRETE
11. EXCAVATION AND OVERBREAK BEYOND EXCAVATION LINE ('A' LINE) SHALL BE BACKFILLED WITH CONCRETE OR SHOTCRETE.
12. SEE SPECIFICATION SECTION 31 71 01 FOR REQUIREMENTS OF INITIAL SUPPORT ELEMENTS WITH RESPECT TO THE "B" LINE.
13. SUPPORT FOR TEMPORARY ENLARGEMENTS THAT MAY BE REQUIRED BY THE CONTRACTOR NOT SHOWN. CONTRACTOR SHALL DESIGN ANY ADDITIONAL SUPPORT IN ACCORDANCE TO THE TECHNICAL SPECIFICATIONS.
14. SOME SECTIONS OF THE TUNNEL AND ADIT SHOWN IN THIS SHEET WILL REQUIRE THE USE OF STEEL RIBS AND TIMBER LAGGING FOR INITIAL ROCK SUPPORT (I.E., TYPE 2 SUPPORT). CONTRACTOR SHALL FABRICATE THE STEEL RIBS AND HAVE THEM AVAILABLE ON-SITE DURING TUNNEL CONSTRUCTION. REFER TO SHEET SMRT-ST-004 AND SPECIFICATION SECTION 31 72 00 FOR FURTHER DETAILS.
15. TUNNEL EXCAVATION WIDTH AND HEIGHT MODIFICATIONS SHALL BE DESIGNED BY THE CONTRACTOR TO SUIT MEANS AND METHODS, ALL GROUND SUPPORT AND OTHER WORK ASSOCIATED WITH INCREASED TUNNEL EXCAVATION SIZE SHALL BE DESIGNED AND PERFORMED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER FOR THE MODIFICATION AND ALL ASSOCIATED IMPACTS TO THE WORK.

O06A ADIT INITIAL SUPPORT TYPE 1

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

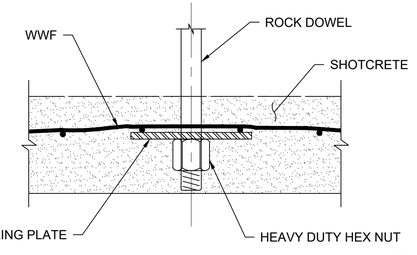
2 -



ROCK DOWEL AND STEEL MINE STRAP SUPPORT SECTION

SCALE: NTS

A -



ROCK DOWEL SUPPORT SECTION

SCALE: NTS

B -

Designed by:	REVISION			
ANC	REV No.	DATE	DESCRIPTION	APPV
Drawn by:	1	12/08/25	REVISION FOR ADDENDUM 9	ZC
RGR				
Checked by:				
DJP				

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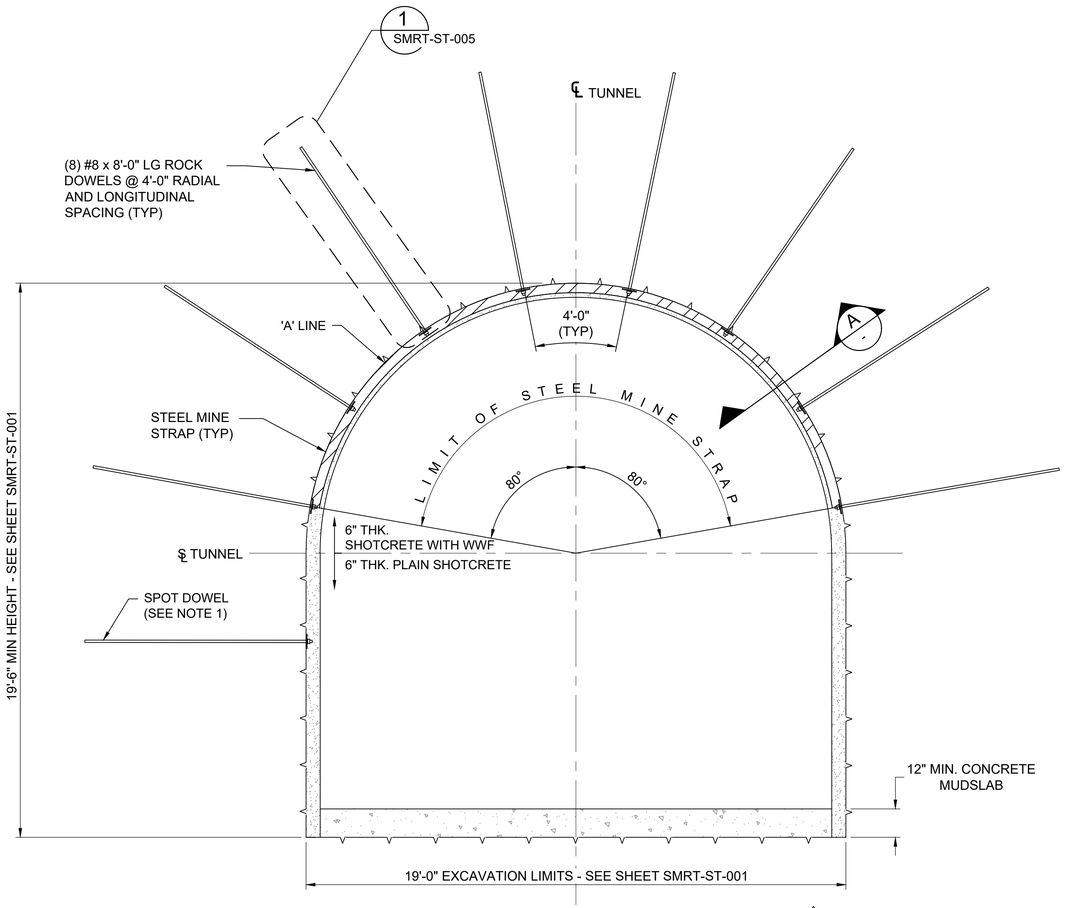
ALLEGHENY COUNTY SANITARY AUTHORITY (ALCOSAN)
OHIO RIVER TUNNEL (ORT)

CCT-ST-011
NON-TBM TUNNEL INITIAL SUPPORT - TYPE 1
TUNNEL DETAILS SHEET 2 OF 3

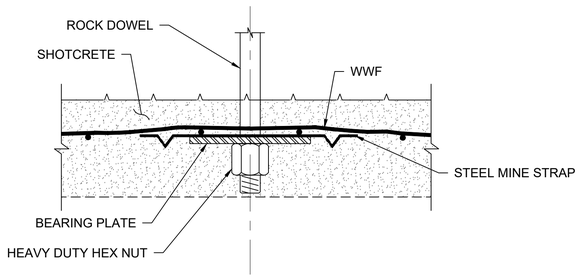
Contract: 1797
File: CCT-ST-011.dwg
Date: 07/30/2025
Sheet: 092 OF 770

FILE NAME:C:\Users\PLE92466\DC\ACCDocs\Mott MacDonald\507105621 - ALCOSAN Ohio River Tunnel Design - T&M\Project Files\1 - ORT\05-Structural\Sheets - CCT-ST-011 LAST SAVED BY: PLE92466 PLOT DATE:12/8/2025 11:49:25 AM



SMRT, SMRT STUB TUNNEL (AT SMRT-O14-DS), AND SMRT-O41-AD TUNNEL INITIAL SUPPORT TYPE 1 (1)

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



ROCK DOWEL AND STEEL MINE STRAP SUPPORT SECTION (A -)

SCALE: NTS

NOTES

1. THE CONTRACTOR SHALL INSTALL SPOT ROCK DOWELS, ADDITIONAL WELDED WIRE FABRIC, SHOTCRETE, AND MINE STRAPS WHERE NECESSARY.
2. ALL ROCK DOWELS SHALL BE INSTALLED AS SPECIFIED.
3. ALL WELDED WIRE FABRIC SHALL BE 4"x4"- W2.0xW2.0.
4. ALL ROCK DOWEL LENGTHS SHOWN ARE MINIMUM EMBEDDED LENGTH IN ROCK. ADDITIONAL DOWEL BAR LENGTH SHALL BE PROVIDED FOR NUT AND BEARING PLATE CONNECTION.
5. ALL ROCK DOWELS SHALL BE FULLY ENCAPSULATED WITH NON-SHRINK RESIN GROUT OVER THE ENTIRE EMBEDDED LENGTH. SEE TECHNICAL SPECIFICATIONS FOR DETAILS.
6. PROBING AND GROUTING IS REQUIRED AT THE TUNNEL FACE FOR GROUNDWATER CONTROL PRIOR TO TUNNEL EXCAVATION. REFER TO SHEET SMRT-ST-004 FOR FURTHER DETAILS.
7. ALL STRUCTURAL STEEL SHALL CONFORM TO THE STANDARDS REQUIRED IN THE TECHNICAL SPECIFICATIONS.
8. INSTALL 1" DIA. WEEP HOLES IN SHOTCRETE AT LOCATIONS OF FLOWING WATER IN ROCK SURFACE AND AT DAMP PATCHES IN SHOTCRETE.
9. EXCAVATION AND OVERBREAK BEYOND EXCAVATION LINE ('A' LINE) SHALL BE BACKFILLED WITH CONCRETE OR SHOTCRETE.
10. SEE SPECIFICATION SECTION 31 71 01 FOR REQUIREMENTS OF INITIAL SUPPORT ELEMENTS WITH RESPECT TO THE 'B' LINE.
11. SUPPORT FOR TEMPORARY ENLARGEMENTS THAT MAY BE REQUIRED BY THE CONTRACTOR NOT SHOWN. CONTRACTOR SHALL DESIGN ANY ADDITIONAL SUPPORT IN ACCORDANCE TO THE TECHNICAL SPECIFICATIONS.
12. IT IS ANTICIPATED THAT SOME SECTIONS OF THE SMRT TUNNEL WILL REQUIRE THE USE OF STEEL RIBS AND TIMBER LAGGING FOR INITIAL ROCK SUPPORT (I.E., TYPE 2 SUPPORT). CONTRACTOR SHALL FABRICATE THE STEEL RIBS AND HAVE THEM AVAILABLE ON-SITE DURING TUNNEL CONSTRUCTION. REFER TO SHEET SMRT-ST-004 AND SPECIFICATION SECTION 31 72 00 FOR FURTHER DETAILS.
13. TUNNEL EXCAVATION WIDTH AND HEIGHT MODIFICATIONS SHALL BE DESIGNED BY THE CONTRACTOR TO SUIT MEANS AND METHODS, ALL GROUND SUPPORT AND OTHER WORK ASSOCIATED WITH INCREASED TUNNEL EXCAVATION SIZE SHALL BE DESIGNED AND PERFORMED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER FOR THE MODIFICATION AND ALL ASSOCIATED IMPACTS TO THE WORK.

Designed by:	REVISION			
ANC	REV No.	DATE	DESCRIPTION	APPV
Drawn by:	1	12/08/25	REVISION FOR ADDENDUM 9	ZC
RGR				
Checked by:				
DJP				

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

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — ZHENQI CAI — ENGINEER — No. PE036706

ARLETTA SCOTT WILLIAMS
EXECUTIVE DIRECTOR, ALCOSAN
3300 PREBLE AVE.
PITTSBURGH, PA 15233
(412) 766 - 4810
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ALLEGHENY COUNTY SANITARY AUTHORITY (ALCOSAN)
OHIO RIVER TUNNEL (ORT)

SMRT-ST-002
TUNNEL INITIAL SUPPORT - TYPE 1
TUNNEL DETAILS SHEET 2 OF 3

Contract:	1797
File:	SMRT-ST-002.dwg
Date:	07/30/2025
Sheet:	095 OF 770

Addendum No. 9

Attachment B

APPENDIX E – SUPPLEMENTAL INFORMATION (FOR INFORMATION ONLY)

SECTION 11

- Norfolk Southern PC Line Retaining Wall Rehabilitation As-Builts - Near A48 (12 sheets)

AS-BUILT DRAWINGS - SECTION 2, SECTION 3 AND SECTION 3 LOWER WALL

NORFOLK SOUTHERN

RAILWAY COMPANY

DRAWINGS
FOR
REHABILITATION
OF
THE NORFOLK SOUTHERN RETAINING WALLS FROM PC-0.78 TO PC-1.20 CITY OF PITTSBURGH, ALLEGHENY COUNTY, PA

INDEX OF DRAWINGS

SUMMARY OF ESTIMATED MATERIAL QUANTITIES

ITEM	UNIT	SECTION 1	SECTION 2	SECTION 3	TOTAL
MOBILIZATION	LS	1	1	1	-
MAINTENANCE AND PROTECTION OF TRAFFIC DURING CONSTRUCTION	LS	1	1	1	-
CLEARING AND GRUBBING	LS	1	1	1	-
STORM INLET PROTECTION	EA	1	1	1	3
CLASS 3 EXCAVATION	CY	49	-	15	64
CAST-IN-PLACE CONCRETE	CY	74	34	56	164
REMOVAL OF PORTION OF EXISTING RETAINING WALL	LS	1	1	1	-
REHABILITATE DETERIORATED CONCRETE	CF	1807	4416	4954	11177
HANDRAIL	LF	396	479	602	1476
CLEAN AND FLUSH WEEPHOLES	EA	-	-	6	6
CONCRETE COATING	SY	750	1210	1460	3420

THIS PROJECT IS CONCRETE REHABILITATION OF THREE SECTIONS OF CAST-IN-PLACE CONCRETE RETAINING WALL SUPPORTING NORFOLK SOUTHERN RAILWAY COMPANY'S FORT WAYNE LINE.

INLET AND OUTLET PROTECTION	RC-72M	02/08/19
DESCRIPTION	DWG. NO.	APP. DATE

SUPPLEMENTAL DRAWINGS

PREPARED BY:
AECOM
AECOM TECHNICAL SERVICES, INC.
707 GRANT STREET
5TH FLOOR
PITTSBURGH, PA 15219

COMMONWEALTH OF PENNSYLVANIA — REGISTERED PROFESSIONAL — DANIEL M. EHRMAN — ENGINEER — PE086975

DATE: DECEMBER 20, 2024

PLOTTED: 18-DEC-2024 08:53

GENERAL:

1. PROVIDE MATERIALS AND PERFORM WORK IN ACCORDANCE WITH SPECIFICATIONS, AREMA MANUAL FOR RAILWAY ENGINEERING, 2023 (AREMA) CHAPTER 8 AND CHAPTER 15, AASHTO/AWS BRIDGE WELDING CODE D1.5M/D1.5: 2020, AND PENNDOT PUBLICATION 408/2020.
2. ALL DIMENSIONS SHOWN ARE HORIZONTAL, EXCEPT AS NOTED.
3. VERIFY ALL DIMENSIONS AND GEOMETRY OF THE EXISTING STRUCTURES IN THE FIELD AS NECESSARY FOR PROPER FIT OF THE PROPOSED CONSTRUCTION.
4. DIMENSIONS SHOWN ARE FOR A NORMAL TEMPERATURE OF 68°F.
5. PRIOR TO PERFORMING WORK, SURVEY THE EXISTING TOP OF COPING AT 50' INCREMENTS OR ANYWHERE THERE ARE ABRUPT CHANGES IN THE HORIZONTAL OR VERTICAL DIRECTION. COMPLETE THE SURVEY IN NAVD 1988 AND ESTABLISH TWO BENCHMARKS THAT CAN BE REPLICATED NEAR THE PROJECT.
6. SUBMIT ALL SURVEY DATA AND PROPOSED TOP OF ELEVATIONS TO NORFOLK SOUTHERN RAILWAY COMPANY FOR REVIEW AND APPROVAL. THESE SUBMITTALS SHALL BE PREPARED BY A PROFESSIONAL ENGINEER OR A PROFESSIONAL LAND SURVEYOR REGISTERED IN PENNSYLVANIA. SEE SPECIAL PROVISIONS.
7. SUBMIT AS-BUILT COPING ELEVATIONS TO VERIFY THE FINAL CONSTRUCTION. THESE SUBMITTALS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER OR A PROFESSIONAL LAND SURVEYOR REGISTERED IN PENNSYLVANIA.
8. REPAIR ANY DAMAGE OR MODIFICATIONS TO THE STRUCTURES OR OTHER FACILITIES, INCLUDING BUT NOT LIMITED TO EXISTING TRACK STRUCTURE AND ROADWAY SIGNAGE, DUE TO THIS WORK TO PRECONSTRUCTION CONDITIONS.
9. CONTRACTOR IS NOTIFIED THAT THERE IS SIGNIFICANT DEBRIS, INCLUDING BUT NOT LIMITED TO NEEDLES AND GLASS, THROUGHOUT THE PROJECT SITE.

DESIGN SPECIFICATIONS:

1. AREMA MANUAL FOR RAILWAY ENGINEERING, 2023 (AREMA).
2. DESIGN OF NEW OR REHABILITATED PORTIONS OF RETAINING WALLS ARE IN ACCORDANCE WITH THE SERVICE LOAD DESIGN METHOD.

DESIGN LIVE LOADS:

1. ANALYSIS OF THE COPING: COOPER E-80.
2. LIVE LOAD DISTRIBUTION TO THE RETAINING WALLS IS BASED UPON THE BOUSSINESQ EQUATION FOR STRIP LOADS AS DEFINED IN AREMA, CHAPTER 8, SECTION 20.3.2.2.

CONCRETE:

1. PROVIDE 2 INCH CONCRETE COVER ON REINFORCEMENT BARS, EXCEPT AS NOTED.
2. USE CEMENT CONCRETE WITH A 28-DAY COMPRESSIVE STRENGTH OF 3500 PSI WITH NO. 57 COARSE AGGREGATE FOR CAST-IN-PLACE CONCRETE AND WITH NO. 8 COARSE AGGREGATE FOR DETERIORATED CONCRETE REHABILITATION .
3. A HIGHER CLASS CONCRETE MAY BE SUBSTITUTED FOR A LOWER CLASS CONCRETE AT NO ADDITIONAL COST TO NORFOLK SOUTHERN RAILWAY COMPANY, IF APPROVED BY THE NORFOLK SOUTHERN RAILWAY COMPANY'S ENGINEER.
4. CHAMFER EXPOSED CONCRETE EDGES 3/4 INCH BY 3/4 INCH, EXCEPT AS NOTED.
5. PROVIDE EPOXY BONDING COMPOUND IN ACCORDANCE WITH THE SPECIFICATIONS. USE EPOXY BONDING COMPOUND WHEREVER PREVIOUSLY PLACED HARDENED CONCRETE SURFACES ARE TO COME IN CONTACT WITH NEW CONCRETE.
6. IF CONTRACTOR ELECTS TO UTILIZE CAST-IN-PLACE ANCHORS, SET ANCHORS TO TEMPLATE.
7. RAKE FINISH ALL HORIZONTAL CONSTRUCTION JOINTS, EXCEPT AS INDICATED.

REINFORCEMENT:

1. PROVIDE GRADE 60 REINFORCING STEEL BARS THAT MEET THE REQUIREMENTS OF ASTM A 615/A 615M, A 996/ A 996M, OR A 706/A 706M. DO NOT WELD GRADE 60 REINFORCING STEEL BARS UNLESS SPECIFIED. GRADE 40 REINFORCING STEEL BARS MAY BE SUBSTITUTED WITH A PROPORTIONAL INCREASE IN CROSS-SECTIONAL AREA, IF APPROVED BY NORFOLK SOUTHERN RAILWAY COMPANY'S ENGINEER.
2. USE EPOXY-COATED REINFORCEMENT BARS AND WELDED WIRE FABRIC.
3. GALVANIZED REINFORCING STEEL BARS MAY BE SUBSTITUTED FOR EPOXY-COATED REINFORCING STEEL BARS AT NO ADDITIONAL COST TO NORFOLK SOUTHERN RAILWAY COMPANY.
4. WELDING OF REINFORCEMENT BARS DURING FABRICATION OR CONSTRUCTION IS NOT PERMITTED UNLESS SPECIFIED.
5. PROVIDE LAP SPLICES EQUAL TO 24" MINIMUM FOR ALL PROPOSED EPOXY COATED #5 BARS. ANY OTHER REQUIRED LAP SPLICES SHALL BE DETERMINED IN ACCORDANCE WITH AREMA AND INDICATED ON THE SHOP DRAWINGS.

DEMOLITION, REHABILITATION AND MODIFICATION:

1. EXERCISE CARE DURING DEMOLITION OF THE EXISTING STRUCTURES TO AVOID DAMAGE TO ANY PORTION DESIGNATED TO BE REUSED OR TO REMAIN. REPAIR ANY DAMAGE OR REPLACE ANY DAMAGED MATERIALS TO THE SATISFACTION OF NORFOLK SOUTHERN RAILWAY COMPANY'S ENGINEER AT NO ADDITIONAL COST TO NORFOLK SOUTHERN RAILWAY COMPANY.
2. CONTRACTOR'S DEMOLITION PLAN SHALL INCLUDE ALL NECESSARY PROVISIONS TO ENSURE THE STABILITY OF THE TRACKS AT ALL TIMES.
3. NORFOLK SOUTHERN RAILWAY COMPANY'S ENGINEER RESERVES THE RIGHT TO CHANGE THE NATURE AND LIMITS OF THE WORK TO ENSURE A SATISFACTORY REHABILITATION.
4. DETERMINE THE QUANTITIES FOR REHABILITATION OF DETERIORATED CONCRETE FROM MEASUREMENTS OF THE VOLUMES OF THE RESPECTIVE PATCHES TAKEN BY NORFOLK SOUTHERN RAILWAY COMPANY'S ENGINEER AND CHECKED BY THE CONTRACTOR BEFORE THE PATCHES ARE FILLED WITH NEW CONCRETE.
5. NORFOLK SOUTHERN RAILWAY COMPANY DOES NOT GUARANTEE THE QUANTITY OF ANY DETERIORATED OR SPALLED AREAS OF CONCRETE. THE APPROXIMATE QUANTITIES SHOWN ARE FOR THE CONTRACTORS GUIDANCE ONLY. ACTUAL QUANTITIES WILL BE DETERMINED IN THE FIELD.

EXISTING PLANS:

1. DO NOT CONSIDER ANY OF THE DATA ON THE EXISTING STRUCTURES SUPPLIED IN THE ORIGINAL DESIGN DRAWINGS OR MADE AVAILABLE BY NORFOLK SOUTHERN RAILWAY COMPANY OR ITS AUTHORIZED AGENTS AS POSITIVE REPRESENTATIONS OF ANY OF THE CONDITIONS THAT WILL BE ENCOUNTERED IN THE FIELD.
2. THE INFORMATION SHOWN ON THE PLANS FOR THE EXISTING STRUCTURES IS NOT PART OF THE PLANS, PROPOSAL, OR CONTRACT AND IS NOT TO BE CONSIDERED A BASIS FOR COMPUTATION OF THE UNIT PRICES USED FOR BIDDING PURPOSES. THERE IS NO EXPRESSED OR IMPLIED AGREEMENT THAT INFORMATION IS CORRECTLY SHOWN. THE BIDDER IS NOT TO RELY ON THIS INFORMATION, BUT IS TO ASSUME THE POSSIBILITY THAT CONDITIONS AFFECTING THE COSTS AND/OR QUANTITIES OF WORK TO BE PERFORMED MAY DIFFER FROM THOSE INDICATED. REFERENCE DRAWINGS ARE:

- PC-0.80 - ANDERSON ST - PENNSYLVANIA RAILROAD (PRR) PLANS, REVISED 11-17-1921
- PC-0.80 - ANDERSON ST - URBAN REDEVELOPMENT AUTHORITY PLANS, DATED 3-10-2010
- PC-0.87 - SANDUSKY ST - PRR PLANS, REVISED 6-26-1914
- PC-0.87 - SANDUSKY ST - AMERICAN BRIDGE CO PLANS, REVISED 6-21-1902
- PC-0.87 - SANDUSKY ST - AMERICAN BRIDGE CO PLANS, REVISED 3-29-1919
- PC-0.87 - SANDUSKY ST - PPR PLANS, REVISED 11-17-1921
- PC-0.97 - FEDERAL ST - PPR PLANS, DATED 1-27-1902
- PC-0.97 - FEDERAL ST - NORFOLK SOUTHERN PLANS DATED 12-30-2005
- PC-0.97 - FEDERAL ST - NORFOLK SOUTHERN PLANS, DATED 12-29-2014

UTILITIES:

1. AN INITIAL "PA-ONE CALL" HAS IDENTIFIED:
   -BURIED WINDSTREAM CLEC FIBER CROSSING NS RIGHT-OF-WAY

   -BURIED PWSA LINES CROSSING NS RIGHT-OF-WAY AT SANDUSKY ST., ANDERSON ST., FEDERAL ST.; AND BETWEEN FEDERAL ST. AND MERCHANT ST.

   -LUMEN LINES IN THE VICINITY

   -COMCAST LINES IN THE VICINITY

   -DUQUESNE LIGHT LINES IN THE VICINITY

   -PEOPLES GAS COMPANY LINES CROSSING NS RIGHT-OF-WAY AT ANDERSON ST. AND SANDUSKY ST.

   -VERIZON LINES CROSSING NS RIGHT-OF-WAY AT FEDERAL ST., SANDUSKY ST., AND BETWEEN ANDERSON ST. AND SANDUSKY ST.
2. COORDINATE, LOCATE, AND CONDUCT ALL WORK RELATED TO PUBLIC AND PRIVATE UTILITIES IN ACCORDANCE WITH PENNDOT PUBLICATION 408, SECTIONS 105.06 AND 107.12.
3. VERIFY AND LOCATE ALL EXISTING UTILITIES PRIOR TO STARTING WORK, AND CONDUCT OPERATIONS IN A MANNER WHICH ENSURES THE UTILITIES WILL NOT BE DISTURBED OR ENDANGERED AND ASSUME FULL RESPONSIBILITY FOR ANY DAMAGE TO UTILITIES DURING CONSTRUCTION. NORFOLK SOUTHERN RAILWAY COMPANY DOES NOT ASSUME RESPONSIBILITY FOR REIMBURSEMENT OF RELOCATION DESIGN WORK OR LIABILITY FOR ACCURACY OF TYPE, SIZE AND LOCATION OF ANY UTILITY.
4. "ONE CALL" SERVICES DO NOT LOCATE BURIED NORFOLK SOUTHERN SIGNALS AND COMMUNICATIONS LINES. THE CONTRACTOR SHALL CONTACT THE RAILROAD'S REPRESENTATIVE 7 DAYS IN ADVANCE OF WORK AT THOSE PLACES WHERE EXCAVATION, PILE DRIVING, OR HEAVY LOADS MAY DAMAGE THE RAILROAD'S UNDERGROUND FACILITIES. UPON REQUEST FROM THE CONTRACTOR OR SPONSOR, RAILROAD FORCES WILL LOCATE AND PAINT MARK OR FLAG THE RAILROAD'S UNDERGROUND FACILITIES. THE CONTRACTOR SHALL AVOID EXCAVATION OR OTHER DISTURBANCES OF THESE FACILITIES. IF DISTURBANCE OR EXCAVATION IS REQUIRED NEAR A BURIED RAILROAD FACILITY, THE CONTRACTOR SHALL COORDINATE WITH THE RAILROAD TO HAVE THE FACILITY POTHOLED MANUALLY WITH CAREFUL HAND EXCAVATION. THE FACILITY SHALL BE PROTECTED BY THE CONTRACTOR DURING THE COURSE OF THE DISTURBANCE UNDER THE SUPERVISION AND DIRECTION OF THE RAILROAD'S REPRESENTATIVE.

RIGHT-OF-WAY AND CONTRACTOR ACCESS:

1. FOR PORTIONS OF THE WALL FROM ANDERSON STREET THROUGH ALCO PARKING CO, RED 7D, THE ADJACENT PARKING LOTS ARE OWNED BY THE STADIUM AUTHORITY OF THE CITY OF PITTSBURGH (STADIUM AUTHORITY). CONTRACTOR IS REQUIRED TO OBTAIN A LICENSE AGREEMENT FOR ACCESS. THE STADIUM AUTHORITY HAS INDICATED IT IS WILLING TO WORK WITH THE CONTRACTOR REGARDING PROPERTY USAGE IN CONJUNCTION WITH THE LICENSE AGREEMENT. COORDINATE ACCESS WITH DOUG STRALEY (dstraley@pgh-sea.com).
2. FOR PORTIONS OF THE WALL ADJACENT TO THE CLARK EAST LOT, THE ADJACENT LOT IS OWNED BY 501 MARTINDALE ASSOCIATES LP. COORDINATE WITH KENNETH J. YARSKY, COUNSEL FOR 501 MARTINDALE ASSOCIATES LP (Ken.Yarsky@sgkpc.com).

Mark	Description	By	Chk'd	Recm'd.	Date

REVISIONS

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
DANIEL M. FUHRMAN
ENGINEER
PE086975

AECOM
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PITTSBURGH, PA 15219

NORFOLK SOUTHERN

KEYSTONE DIVISION

PC LINE RETAINING WALLS

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA

GENERAL NOTES

VAL SEC V1a	MAP 2	DATE 11/15/2024
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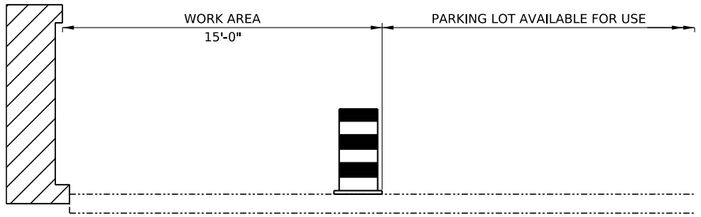
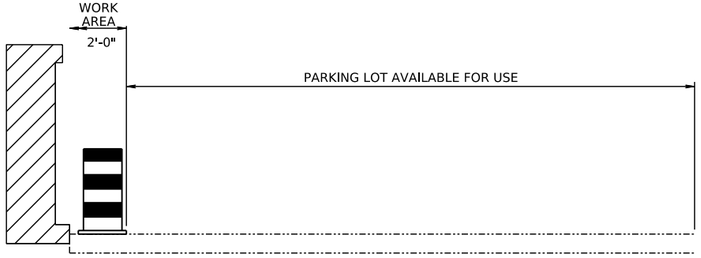


TYPICAL SECTION - SHORT TERM DURING WORKING HOURS
FLAGGING AS REQUIRED

NOT TO SCALE



TYPICAL SECTION - LONG TERM
DURING NON-WORKING HOURS

NOT TO SCALE

TRAFFIC CONTROL

COMPLETE RETAINING WALL WORK USING SHORT-TERM OPERATIONS. UTILIZE TEMPORARY TRAFFIC CONTROL IN ACCORDANCE WITH PENNDOT PUBLICATION 213, AS NEEDED.

DURING NON-WORKING HOURS MAINTAIN PARKING LOT ACCESS, AS SHOWN AND IN ACCORDANCE WITH PUBLICATION 213, AS NEEDED.

LEGEND:

WORK AREA

CHANNELIZING DEVICE

Mark	Description	By	Chk'd	Recm'd.	Date

REVISIONS

AECOM
707 GRANT ST. SUITE 500
PITTSBURGH, PA 15219

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
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PE086575

NORFOLK SOUTHERN

KEYSTONE DIVISION

PC LINE RETAINING WALLS

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA

MAINTENANCE AND PROTECTION OF TRAFFIC DETAILS

VAL SEC V1a	MAP 2	DATE 11/15/2024
FILE BR1115573		SHEET 2 OF 15
MILEPOST PC-0.78 TO PC-1.20	DRAWING NO	PC LINE 02

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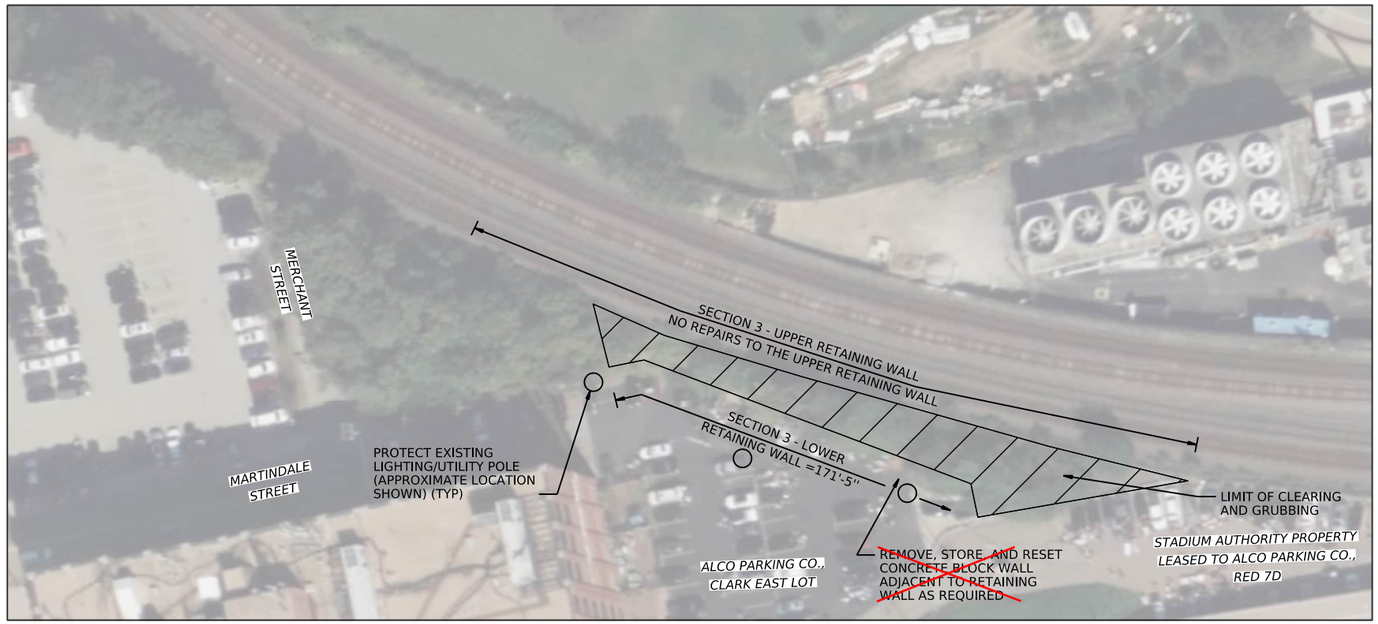
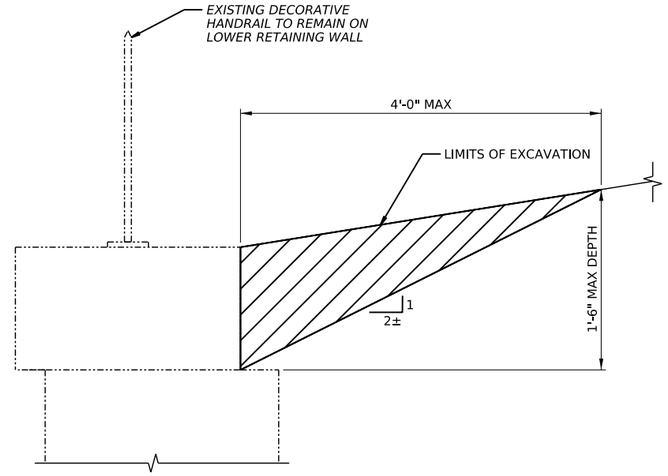
PLOTTED: $$$$DATE$$$



PLAN VIEW - SECTION 3

(AERIAL UTILITIES NOT SHOWN FOR CLARITY)
NOT TO SCALE



SECTION D-D

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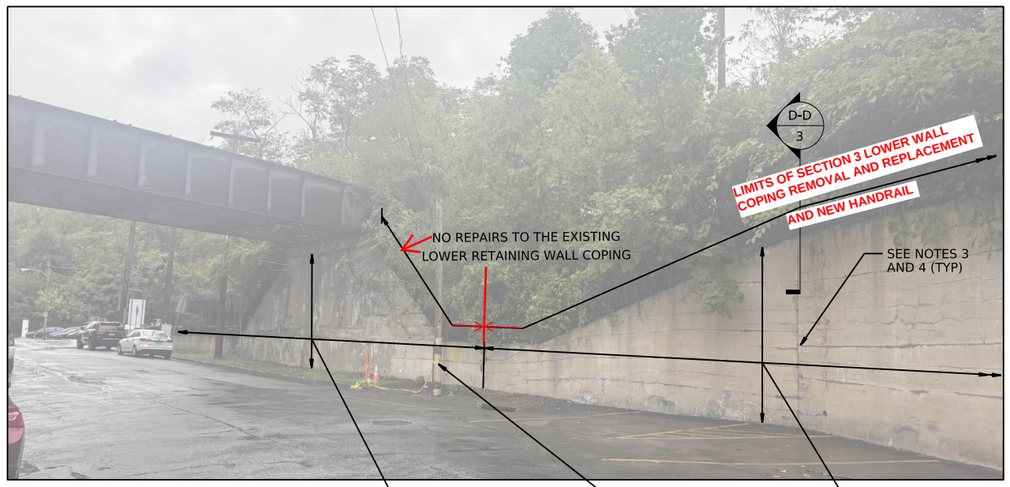

SECTION 3 - LOWER RETAINING WALL AT CLARK EAST LOT

NOT TO SCALE

NOTES:

1. FOR FULL HEIGHT REHABILITATION DETAILS, SEE SHEET 10.
2. FOR DETERIORATED CONCRETE REHABILITATION DETAILS, SEE SHEET 15.
3. MAINTAIN AND REESTABLISH EXISTING VERTICAL CHAMFERS. CHAMFER WIDTH TO MATCH EXISTING. VERTICAL CHAMFER DEPTH TO EQUAL 1/2" MAX. DO NOT LOCATE NEW VERTICAL REINFORCEMENT AT VERTICAL CHAMFERS.
4. WHERE EXISTING VERTICAL CHAMFER SPACING EXCEEDS 20'-0", ESTABLISH NEW VERTICAL CHAMFERS AT 20'-0" MAX SPACING.

Mark	Description	By	Chk'd	Recm'd.	Date

REVISIONS

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL DANIEL M. FUHRMAN ENGINEER PE086575

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KEYSTONE DIVISION

PC LINE RETAINING WALLS

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA

PLAN VIEW - SECTION 3 - PART 1

VAL SEC V1a	MAP 2	DATE 11/15/2024
FILE BR1115573		SHEET 3 OF 15
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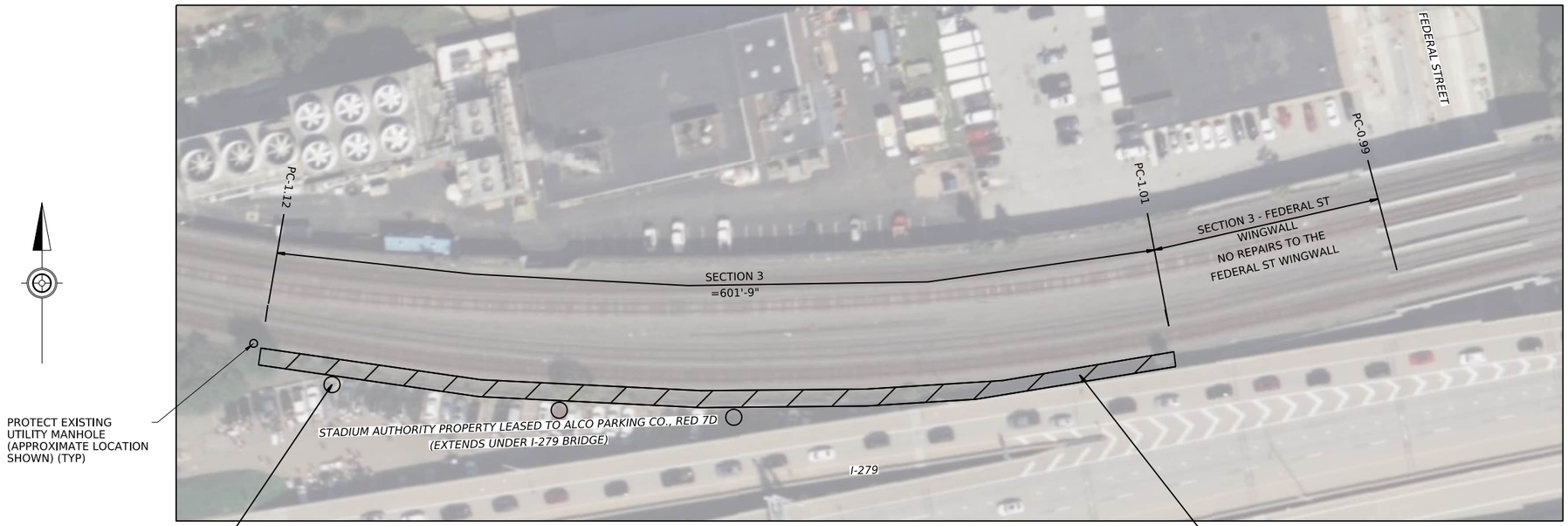

PLAN VIEW - SECTION 3

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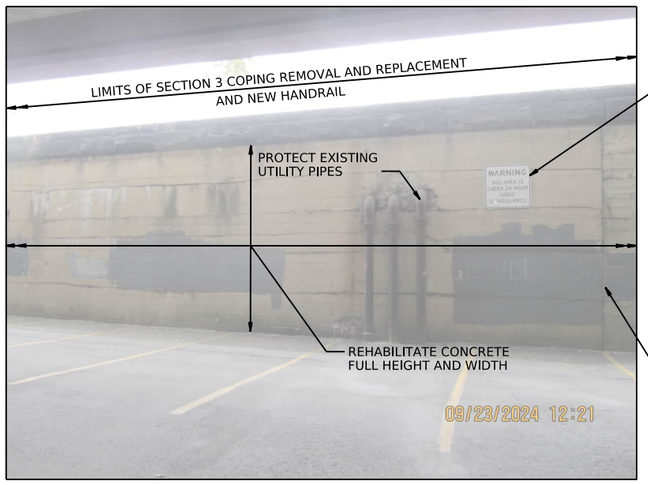
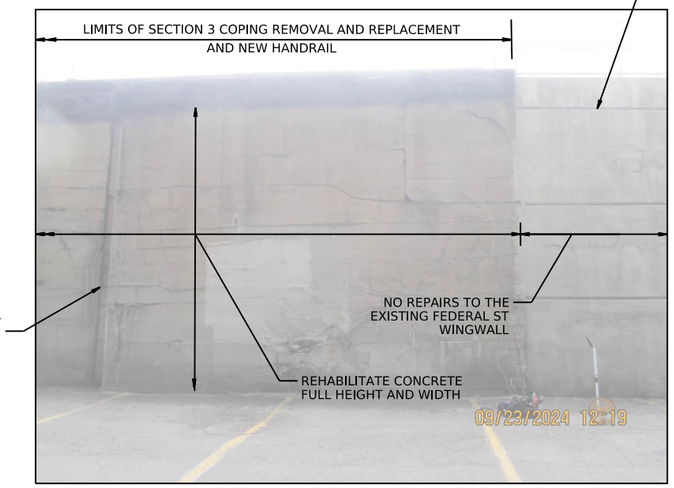


SECTION 3 - RETAINING WALL AT RED 7D - PHOTO 1

NOT TO SCALE



SECTION 3 - RETAINING WALL AT RED 7D - PHOTO 2

NOT TO SCALE

NOTES:

1. FOR COPING REMOVAL LIMITS, SEE SHEET 9.
2. FOR COPING REPLACEMENT AND FULL HEIGHT REHABILITATION DETAILS, SEE SHEET 10.
3. FOR DETERIORATED CONCRETE REHABILITATION DETAILS, SEE SHEET 15.
4. MAINTAIN AND REESTABLISH EXISTING VERTICAL CHAMFERS. CHAMFER WIDTH TO MATCH EXISTING. VERTICAL CHAMFER DEPTH TO EQUAL 1/2" MAX. DO NOT LOCATE NEW VERTICAL REINFORCEMENT AT VERTICAL CHAMFERS.
5. WHERE EXISTING VERTICAL CHAMFER SPACING EXCEEDS 20'-0", ESTABLISH NEW VERTICAL CHAMFERS AT 20'-0" MAX SPACING.
6. FOR HANDRAIL DETAILS, SEE SHEET 14.

Mark	Description	By	Chk'd	Recm'd.	Date
	REVISIONS				

DES: DMF | DWG: DMF | CKD: HCF

COMMONWEALTH OF PENNSYLVANIA
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DANIEL M. FUHRMAN
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NORFOLK SOUTHERN

KEYSTONE DIVISION

PC LINE RETAINING WALLS

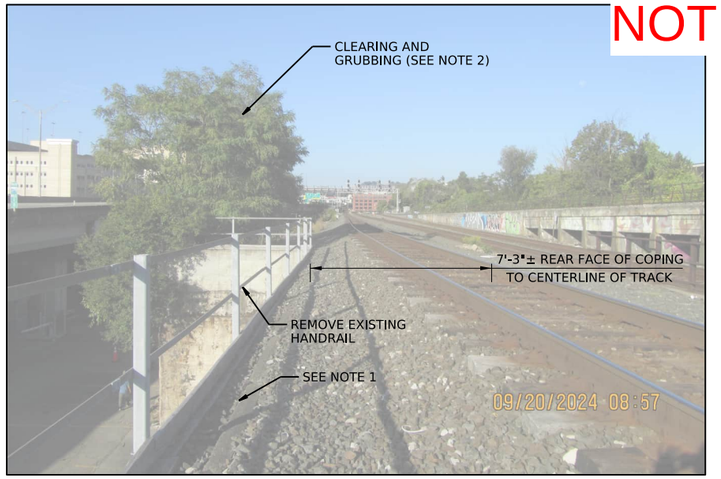
OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES ATLANTA, GA

PLAN VIEW - SECTION 3 - PART 2

VAL SEC V1a	MAP 2	DATE 11/15/2024
FILE BR1115573		SHEET 4 OF 15
MILEPOST PC-0.78 TO PC-1.20	DRAWING NO	PC LINE 04

PLOTTED: 18-DEC-2024 08:56

NOT COMPLETED UNDER THIS CONTRACT



SECTION 1 - ANDERSON ST TO BEND

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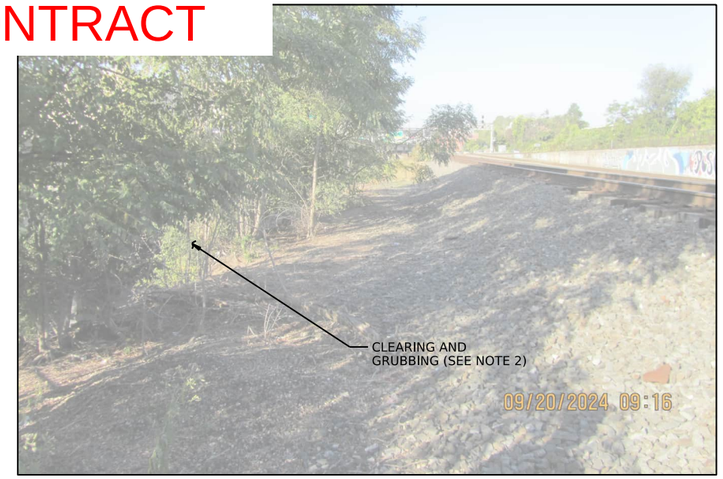

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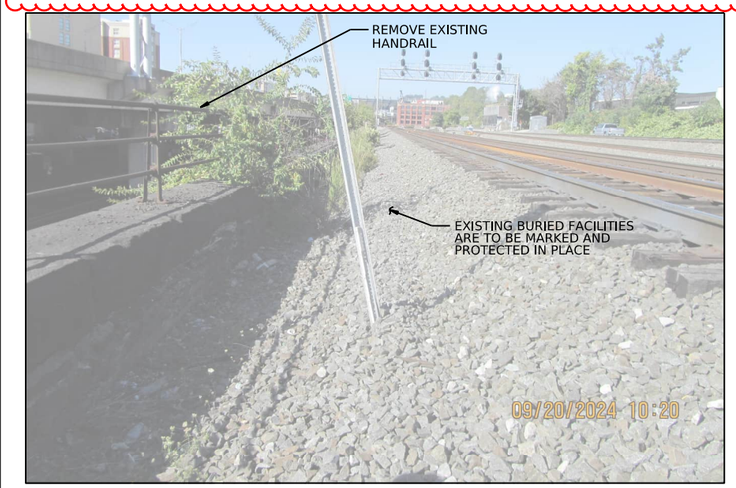

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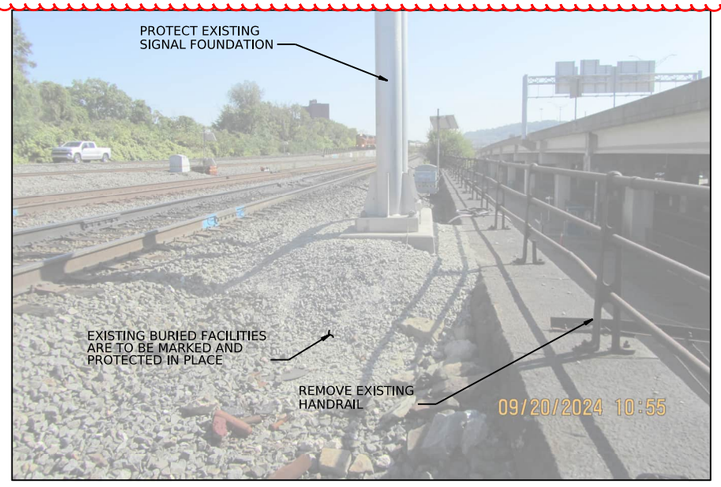

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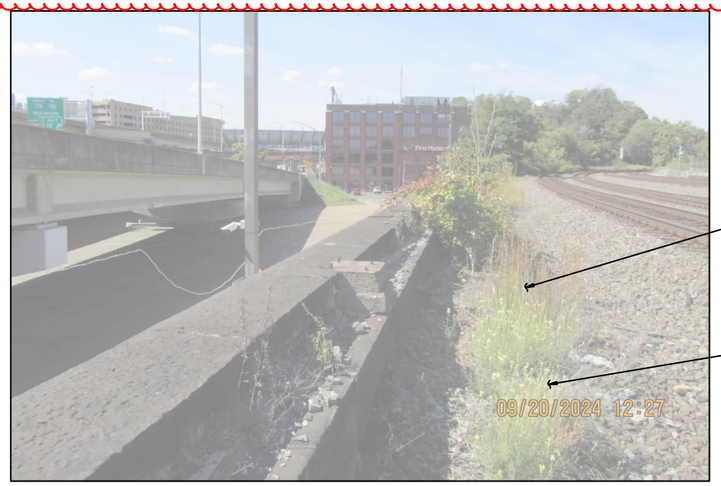

SECTION 3

TYPICAL CONDITIONS AT TRACK LEVEL

Mark	Description	By	Chk'd	Recm'd.	Date
REVISIONS					

NOTES:

1. EXISTING PRECAST CONCRETE BLOCKS ARE TO BE SALVAGED BY THE CONTRACTOR AND RETAINED. NS WILL RETAKE OWNERSHIP OF UNDAMAGED BLOCKS.
2. REMOVE ALL DEBRIS. REMOVE TREES AND VEGETATION THAT ARE IMPACTING THE RETAINING WALL AT THE DIRECTION OF THE ENGINEER.

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KEYSTONE DIVISION

PC LINE RETAINING WALLS

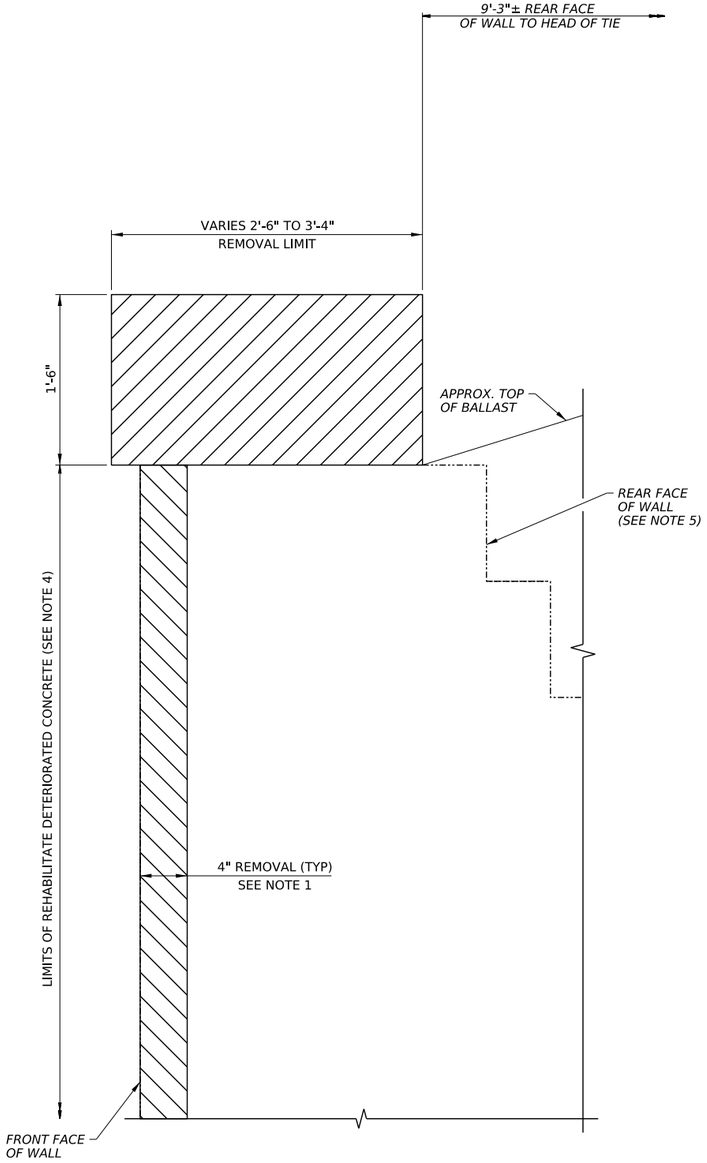
OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA

TRACK LEVEL CONDITIONS

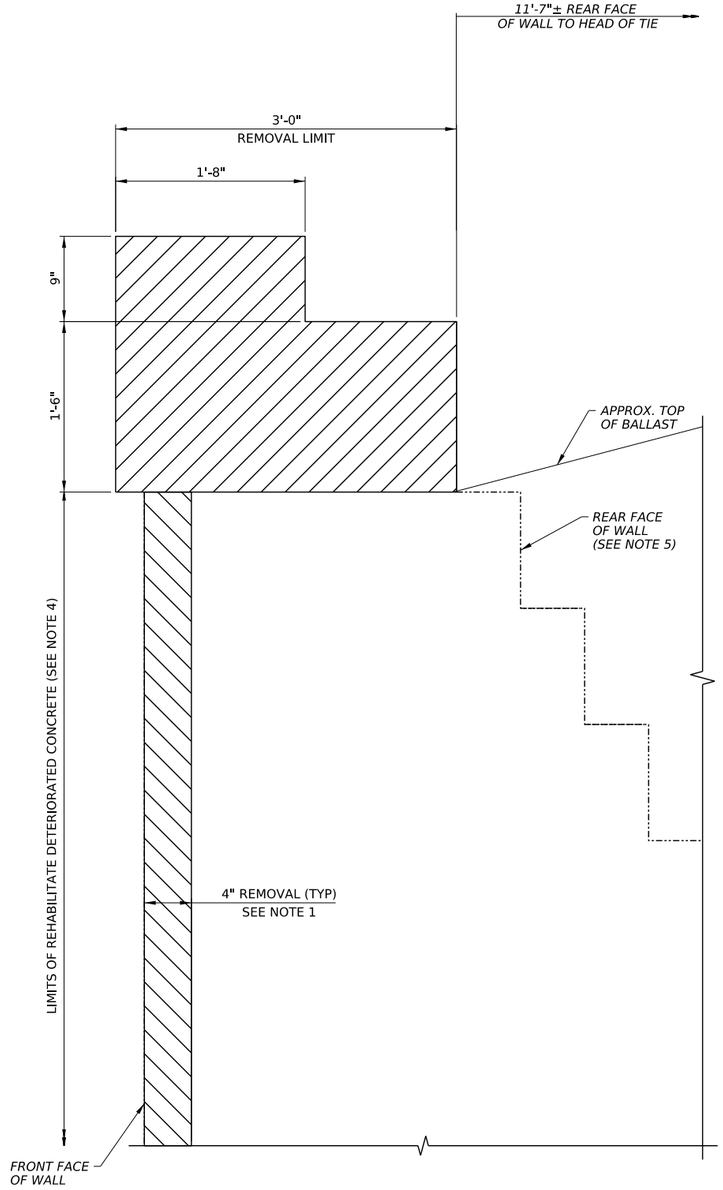
VAL SEC V1a	MAP 2	DATE 11/15/2024
FILE BR1115573		SHEET 8 OF 15
MILEPOST PC-0.78 TO PC-1.20	DRAWING NO	PC LINE 08

DES: DMF	DWG: DMF	CKD: HCF

PLOTTED: 18-DEC-2024 08:56



SECTION 2 - RETAINING WALL



SECTION 3 - RETAINING WALL

REMOVAL LIMITS

NOT TO SCALE

LEGEND:

LIMITS OF COPING REMOVAL

LIMITS OF REHABILITATE DETERIORATED CONCRETE

NOTES:

1. IF CONCRETE IS UNSOUND AT A DEPTH OF 4", DO NOT REMOVE ANY ADDITIONAL CONCRETE WITHOUT THE APPROVAL OF THE NORFOLK SOUTHERN RAILWAY COMPANY ENGINEER.
2. PROVIDE A TEMPORARY HANDRAIL MEETING OSHA AND AREMA STANDARDS UNTIL THE PERMANENT HANDRAIL HAS BEEN INSTALLED UNLESS OTHERWISE DIRECTED BY NORFOLK SOUTHERN.
3. PERFORM EXCAVATION AND REMOVAL ACTIVITIES IN A MANNER THAT MINIMIZES THE DISTURBANCE OF THE EXISTING BALLAST.
4. REMOVAL OF DETERIORATED CONCRETE AND REHABILITATION OF DETERIORATED CONCRETE ARE PAID UNDER REHABILITATE DETERIORATED CONCRETE.
5. THE EXISTING CONSTRUCTION OF THE RETAINING WALL REAR FACE IS UNKNOWN. REPRESENTATIVE LINEWORK SHOWN.

Mark	Description	By	Chk'd	Recm'd.	Date
	REVISIONS				

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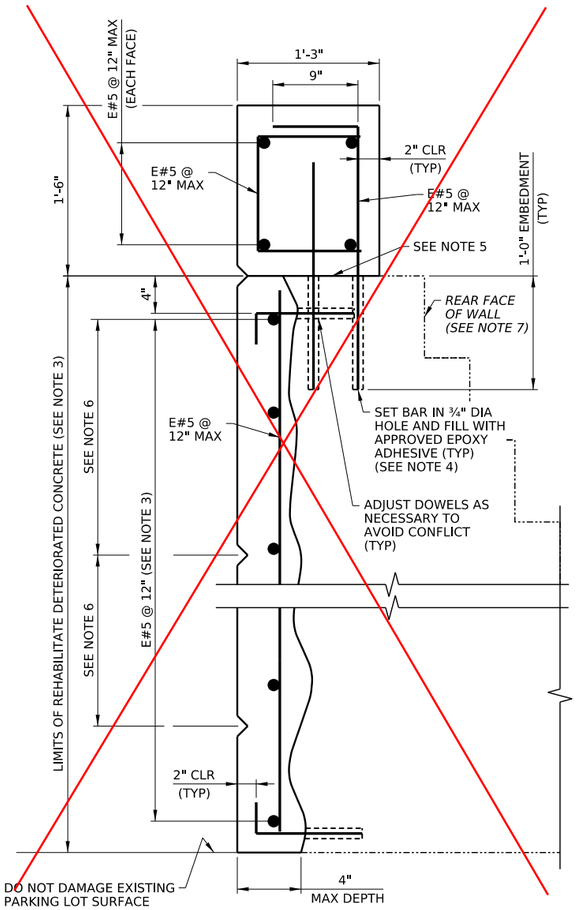
SECTIONS 2 & 3 REMOVAL LIMITS

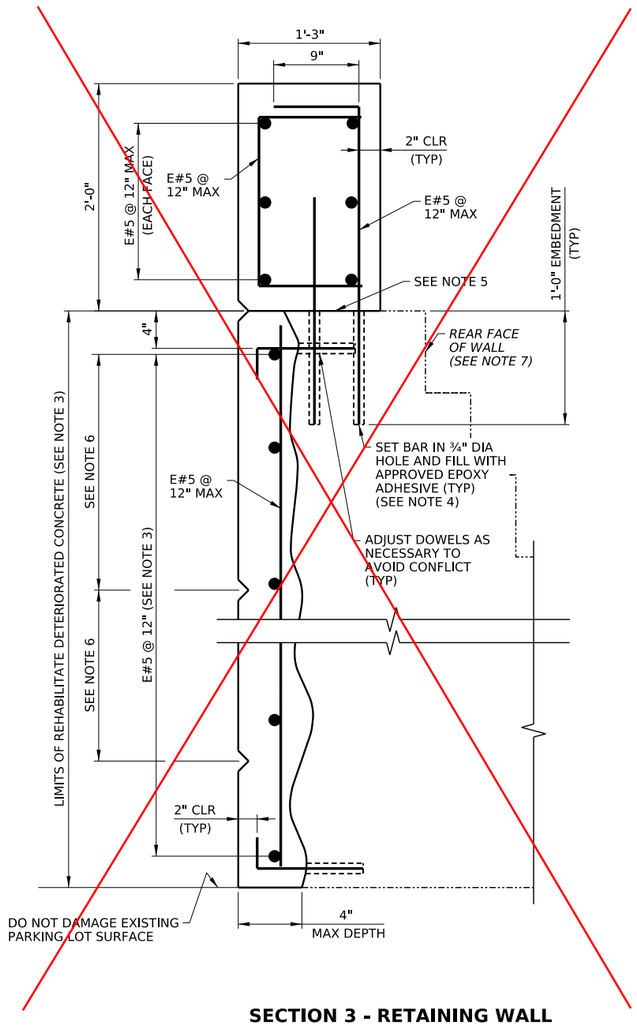
VAL SEC V1a	MAP 2	DATE 11/15/2024	
FILE BR1115573		SHEET 9 OF 15	
MILEPOST PC-0.78 TO PC-1.20		DRAWING NO	PC LINE 09

DES: JWG	DWG: JWG	CKD: DMF

PLOTTED: 18-DEC-2024 08:56



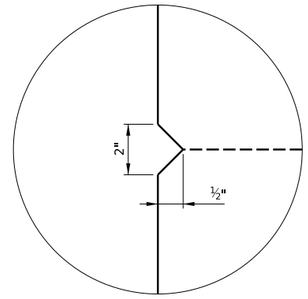
SECTION 2 - RETAINING WALL



SECTION 3 - RETAINING WALL

SECTION 2 & 3 REPLACEMENT LIMITS

NOT TO SCALE



V-NOTCH DETAIL

NOT TO SCALE

NOTES:

1. USE A PACHOMETER TO LOCATE EXISTING REINFORCEMENT (IF PRESENT) WHEN DRILLING DOWEL HOLES TO AVOID DRILLING THRU EXISTING BARS.
2. DO NOT LOCATE NEW HORIZONTAL E#5 AT CHAMFERS.
3. SEE SHEET 15 FOR ADDITIONAL CONCRETE REHABILITATION DETAILS. FULL HEIGHT CONCRETE REHABILITATION INCLUDING REMOVAL OF DETERIORATED CONCRETE, SURFACE PREPARATION, NEW REINFORCEMENT BARS, AND NEW CLASS AA CEMENT CONCRETE TO BE PAID UNDER REHABILITATE DETERIORATED CONCRETE.
4. 12" DOWEL HOLES LOCATED IN COPING REPLACEMENT TO BE PAID UNDER CAST-IN-PLACE CONCRETE.
5. ROUGHEN SURFACE TO 1/4" DEPTH AND COAT ALL SURFACES WHERE NEW CONCRETE IS IN CONTACT WITH EXISTING CONCRETE WITH EPOXY BONDING COMPOUND.
6. INSTALL NEW HORIZONTAL CHAMFERS AT 5' MAX SPACING
7. THE EXISTING CONSTRUCTION OF THE RETAINING WALL REAR FAE IS UNKNOWN. REPRESENTATIVE LINEWORK SHOWN.

Mark	Description	By	Chk'd	Recm'd.	Date
REVISIONS					

DES: JWG | DWG: JWG | CKD: DMF

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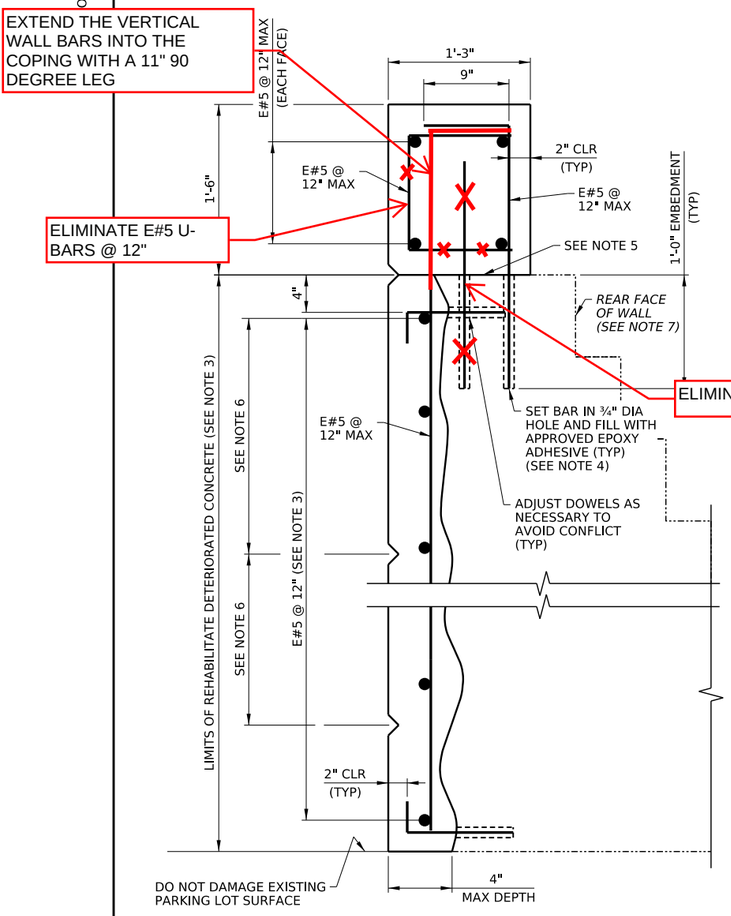
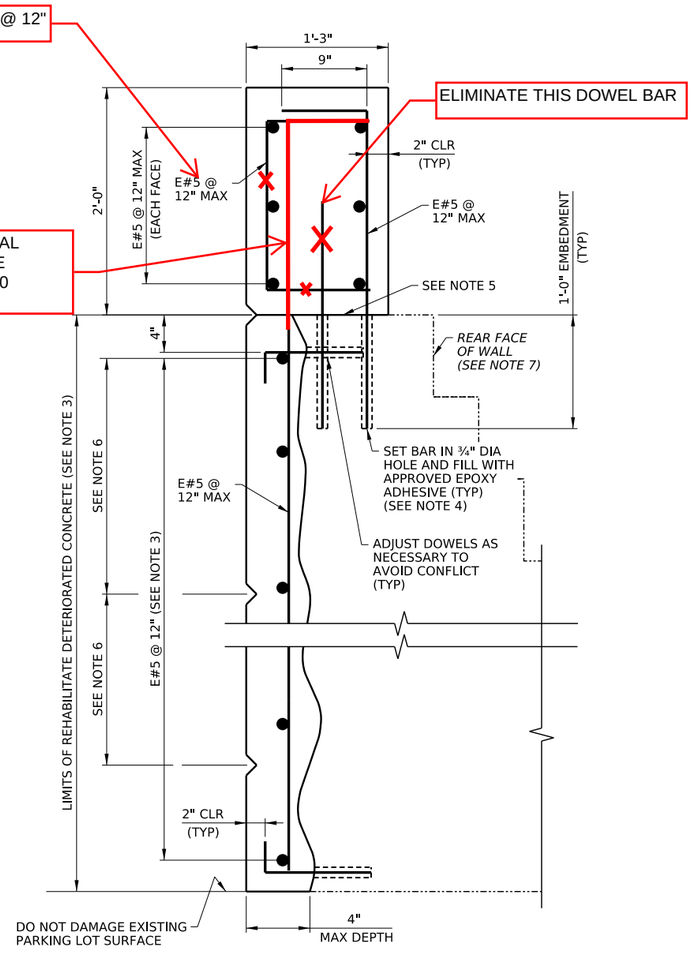
SECTIONS 2 & 3 REPLACEMENT DETAILS

VAL SEC V1a	MAP 2	DATE 11/15/2024
FILE BR1115573		SHEET 10 OF 15
MILEPOST PC-0.78 TO PC-1.20	DRAWING NO	PC LINE 10

PLOTTED: 18-DEC-2024 08:56

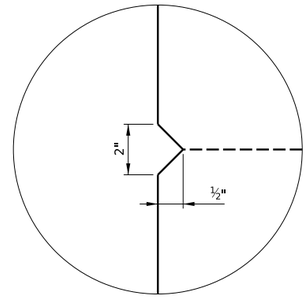


SECTION 2 - RETAINING WALL



SECTION 3 - RETAINING WALL

SECTION 3 - LOWER RETAINING WALL



V-NOTCH DETAIL

NOT TO SCALE

SECTION 2 & 3 REPLACEMENT LIMITS

NOT TO SCALE

NOTES:

1. USE A PACHOMETER TO LOCATE EXISTING REINFORCEMENT (IF PRESENT) WHEN DRILLING DOWEL HOLES TO AVOID DRILLING THRU EXISTING BARS.
2. DO NOT LOCATE NEW HORIZONTAL E#5 AT CHAMFERS.
3. SEE SHEET 15 FOR ADDITIONAL CONCRETE REHABILITATION DETAILS. FULL HEIGHT CONCRETE REHABILITATION INCLUDING REMOVAL OF DETERIORATED CONCRETE, SURFACE PREPARATION, NEW REINFORCEMENT BARS, AND NEW CLASS AA CEMENT CONCRETE TO BE PAID UNDER REHABILITATE DETERIORATED CONCRETE.
4. 12" DOWEL HOLES LOCATED IN COPING REPLACEMENT TO BE PAID UNDER CAST-IN-PLACE CONCRETE.
5. ROUGHEN SURFACE TO 1/4" DEPTH AND COAT ALL SURFACES WHERE NEW CONCRETE IS IN CONTACT WITH EXISTING CONCRETE WITH EPOXY BONDING COMPOUND.
6. INSTALL NEW HORIZONTAL CHAMFERS AT 5' MAX SPACING
7. THE EXISTING CONSTRUCTION OF THE RETAINING WALL REAR FAE IS UNKNOWN. REPRESENTATIVE LINEWORK SHOWN.

Mark	Description	By	Chk'd	Recm'd.	Date
	REVISIONS				

DES: JWG | DWG: JWG | CKD: DMF

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KEYSTONE DIVISION

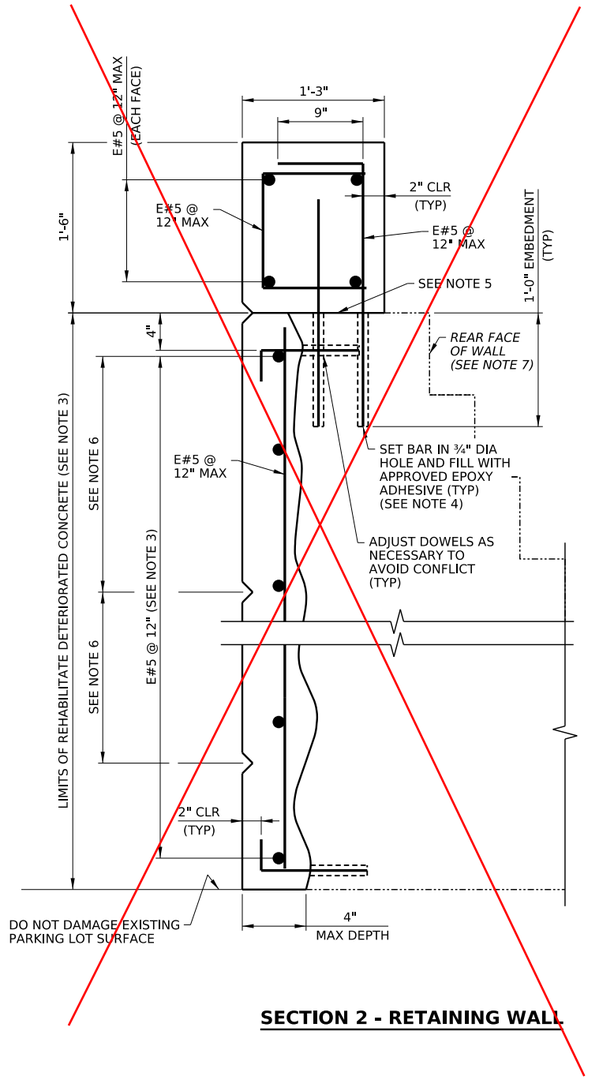
PC LINE RETAINING WALLS

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA

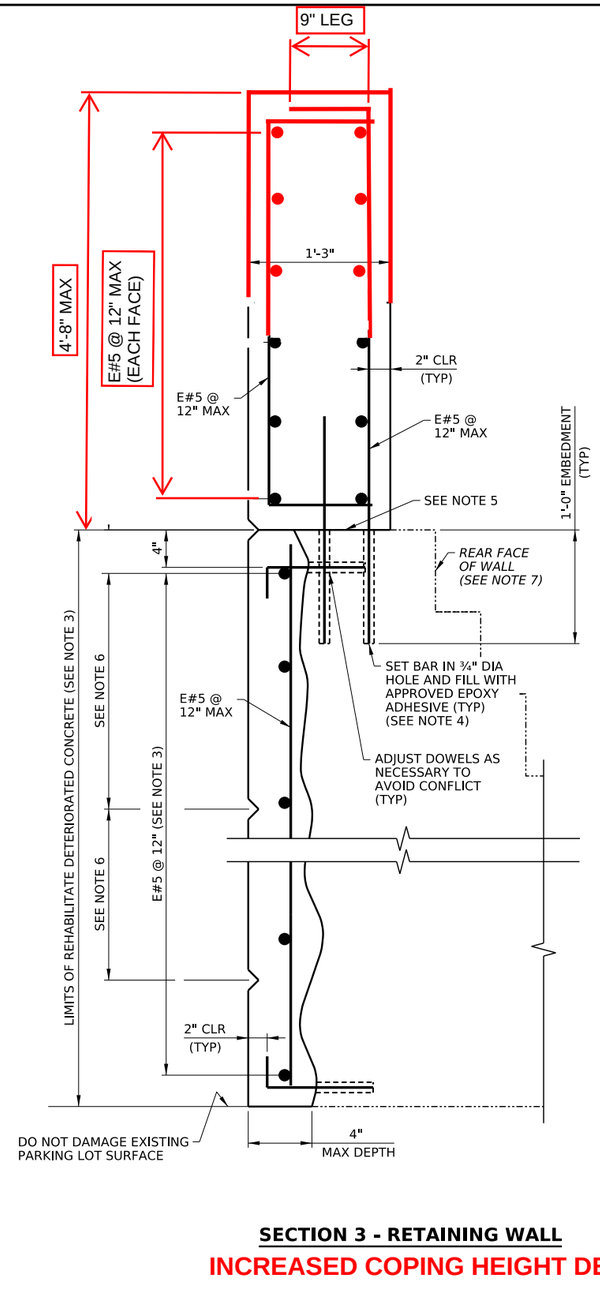
SECTIONS 2 & 3 REPLACEMENT DETAILS

VAL SEC V1a	MAP 2	DATE 11/15/2024
FILE BR1115573		SHEET 10 OF 15
MILEPOST PC-0.78 TO PC-1.20	DRAWING NO	PC LINE 10

PLOTTED: 18-DEC-2024 08:56



SECTION 2 - RETAINING WALL

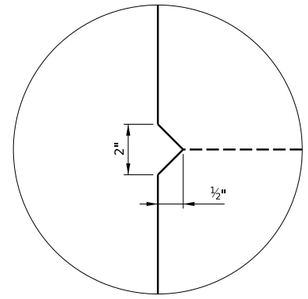


SECTION 3 - RETAINING WALL

INCREASED COPING HEIGHT DETAIL

SECTION 2 & 3 REPLACEMENT LIMITS

NOT TO SCALE



V-NOTCH DETAIL

NOT TO SCALE

NOTES:

1. USE A PACHOMETER TO LOCATE EXISTING REINFORCEMENT (IF PRESENT) WHEN DRILLING DOWEL HOLES TO AVOID DRILLING THRU EXISTING BARS.
2. DO NOT LOCATE NEW HORIZONTAL E#5 AT CHAMFERS.
3. SEE SHEET 15 FOR ADDITIONAL CONCRETE REHABILITATION DETAILS. FULL HEIGHT CONCRETE REHABILITATION INCLUDING REMOVAL OF DETERIORATED CONCRETE, SURFACE PREPARATION, NEW REINFORCEMENT BARS, AND NEW CLASS AA CEMENT CONCRETE TO BE PAID UNDER REHABILITATE DETERIORATED CONCRETE.
4. 12" DOWEL HOLES LOCATED IN COPING REPLACEMENT TO BE PAID UNDER CAST-IN-PLACE CONCRETE.
5. ROUGHEN SURFACE TO 1/4" DEPTH AND COAT ALL SURFACES WHERE NEW CONCRETE IS IN CONTACT WITH EXISTING CONCRETE WITH EPOXY BONDING COMPOUND.
6. INSTALL NEW HORIZONTAL CHAMFERS AT 5' MAX SPACING
7. THE EXISTING CONSTRUCTION OF THE RETAINING WALL REAR FAE IS UNKNOWN. REPRESENTATIVE LINEWORK SHOWN.

Mark	Description	By	Chk'd	Recm'd.	Date
	REVISIONS				

DES: JWG | DWG: JWG | CKD: DMF

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PC LINE RETAINING WALLS

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SECTIONS 2 & 3 REPLACEMENT DETAILS

VAL SEC V1a	MAP 2	DATE 11/15/2024
FILE BR1115573		SHEET 10 OF 15
MILEPOST PC-0.78 TO PC-1.20	DRAWING NO	PC LINE 10

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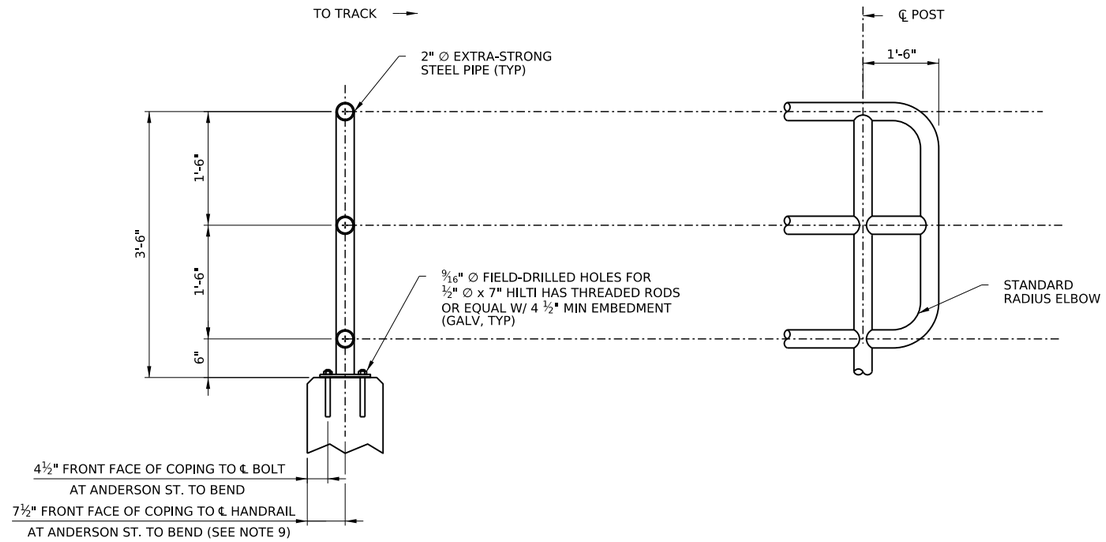
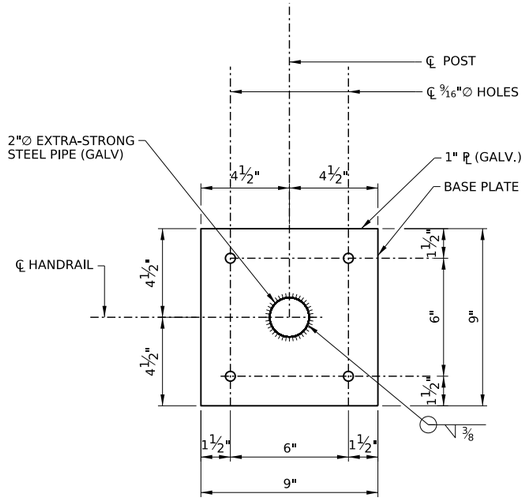


SECTION

NOT TO SCALE

END POST DETAIL

NOT TO SCALE

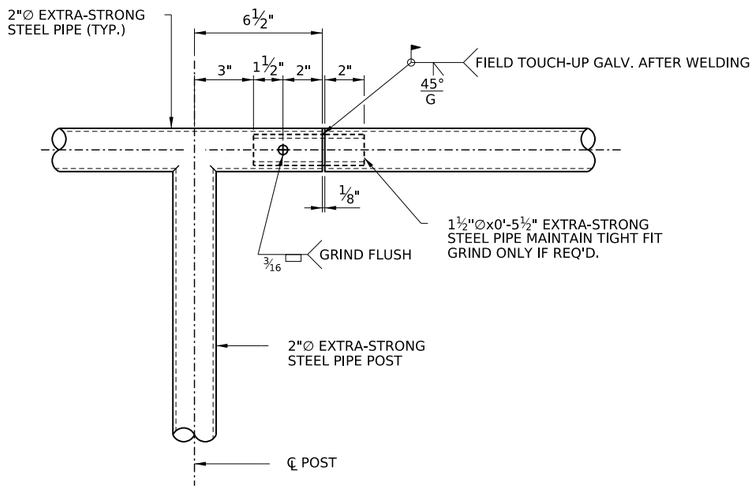


BASE PLATE DETAIL

NOT TO SCALE

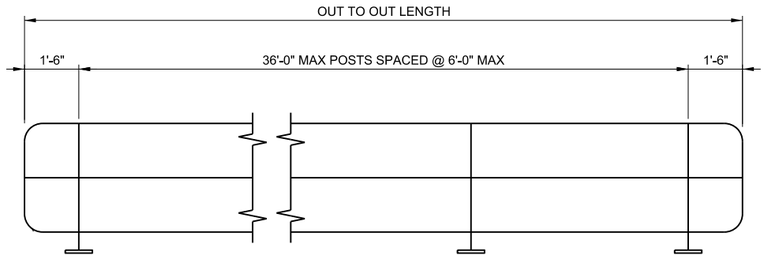
NOTES:

1. BASE PLATE SHALL BE STRUCTURAL STEEL PLATE ASTM A36 AND HOT DIP GALVANIZED.
2. HANDRAIL POSTS, RAILS, BASE PLATES, AND MOUNTING HARDWARE SHALL BE GALVANIZED. SEE SPECIFICATIONS.
3. TOUCH-UP ANY FIELD-WELDED, FIELD-CUT, OR DAMAGED GALVANIZED SURFACES WITH AN APPROVED COLD GALVANIZING SPRAY.
4. JOINTS IN RAILING (SPLICE GAP) SHALL BE LOCATED IN POST SPACING PLAN.
5. ALIGN HANDRAIL SO THE BREAKS BETWEEN ADJACENT HANDRAIL SECTIONS ARE COINCIDENT WITH A VERTICAL CHAMFER.
6. CERTIFIED MILL REPORTS ARE REQUIRED FOR RAIL AND POST. SHOP INSPECTIONS ARE NOT REQUIRED.
7. AFTER ANCHOR BOLT NUTS HAVE BEEN TIGHTENED, THREAD SHALL BE NICKED TO LOCK NUTS.
8. THE CENTERLINE OF ANY SPLICE AND/OR EXPANSION JOINT IS TO BE LOCATED AT LEAST 2'-0" AWAY FROM CENTERLINE OF POST. EXPANSION AND/OR SPLICE JOINT FOR EACH RAIL OF TWO RAILINGS ARE TO BE PLACED IN THE SAME LOCATIONS AND IN THE SAME PANEL.
9. CONTRACTOR SHALL CENTER THE HANDRAIL ON THE WIDTH OF THE COPING EXCEPT AS NOTED.



SPLICE DETAIL

NOT TO SCALE



SCHEMATIC HANDRAIL POST LAYOUT

NOT TO SCALE

Mark	Description	By	Chk'd	Recm'd.	Date
REVISIONS					

DES: AR | DWG: AR | CKD: HCF

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OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA

HANDRAIL DETAILS

VAL SEC V1a	MAP 2	DATE 11/15/2024
FILE BR1115573		SHEET 14 OF 15
MILEPOST PC-0.78 TO PC-1.20	DRAWING NO	PC LINE 14

PLOTTED: 18-DEC-2024 08:57

CONSTRUCTION PROCEDURE

REMOVAL, REHABILITATION AREA PREPARATION, AND REINFORCEMENT INSTALLATION

P1. PROVIDE SATISFACTORY PROTECTIVE SHIELDING BELOW REHABILITATION AREAS. PROTECTIVE SHIELDING IS INCIDENTAL TO REHABILITATE DETERIORATED CONRETE.

P2. PROVIDE MEANS TO COLLECT CONCRETE AND DEBRIS FROM REMOVAL OPERATIONS AND ABRASIVE BLAST MEDIA USED TO CLEAN THE REHABILITATION AREAS.

P3. SOUND AND DETERMINE EXTENT OF REHABILITATION AREAS IN THE PRESENCE OF NORFOLK SOUTHERN RAILWAY COMPANY ENGINEER.

P4. OUTLINE EDGE OF THE DESIGNATED REHABILITATION AREAS WITH A 1" MAXIMUM DEPTH SAWCUT.

P5. WITHIN THE OUTLINED REHABILITATION AREAS, REMOVE DETERIORATED CONCRETE TO A DEPTH OF 4" OR ¾-INCH BEHIND THE FIRST MAT OF REINFORCEMENT BARS TO SOUND CONCRETE. ALLOW UNCOVERED OR EXPOSED REINFORCEMENT BARS TO HAVE A ¾" CLEARANCE ALL AROUND. IF CONCRETE IS UNSOUND AT A DEPTH OF 4" OR ¾-INCH BEHIND THE REINFORCEMENT BARS, DO NOT REMOVE ANY ADDITIONAL CONCRETE WITHOUT THE APPROVAL OF THE NORFOLK SOUTHERN RAILWAY COMPANY ENGINEER.

P6. SQUARE-OUT/BEVEL EDGE OF REHABILITATION AREAS TO KEY IN CONSTRUCTION. USE HAND TOOLS FOR REMOVING DETERIORATED CONCRETE. USE PNEUMATIC HAMMERS, IF REQUIRED, NOT EXCEEDING AN IMPACT RATING OF 30 FOOT POUNDS. IF DETERIORATED CONCRETE EXTENDS BEYOND THE INITIALLY OUTLINED REHABILITATION AREA, ENLARGE AREA AS DIRECTED BY THE NORFOLK SOUTHERN RAILWAY COMPANY ENGINEER.

P7. AFTER REMOVAL OPERATIONS ARE COMPLETE, REMOVE DEBRIS AND LOOSE MATERIALS. IMMEDIATELY BEFORE WET ABRASIVE BLASTING (WAB), WET REHABILITATION AREAS WITH LOW PRESSURE WATER. CLEAN REHABILITATION AREAS, PREPARED SUBSTRATE AND REINFORCEMENT BARS, BY WAB. WAB EXPOSED REINFORCEMENT BARS TO NEAR-WHITE METAL ACCORDING TO SSPC-SP 10 (WAB). ONCE WAB IS COMPLETE, FLUSH REHABILITATION AREAS WITH WATER TO REMOVE ANY REMAINING ABRASIVE BLAST MEDIA. ENSURE REHABILITATION AREAS ARE DRY AND FREE OF SPENT ABRASIVE, THEN EPOXY COAT EXPOSED REINFORCEMENT BARS WITHIN THE SAME WORKDAY AS WAB. REBLAST REINFORCEMENT BARS THAT ARE NOT EPOXY COATED WITHIN THE SAME WORKDAY OR DO NOT MEET SSPC-SP 10 (WAB). SPLICE DAMAGED OR HEAVILY CORRODED REINFORCEMENT BARS BARS AT 50% OR MORE SECTION LOSS. FOR SPLICING, MINIMUM SPLICES SHALL BE AS DEFINED IN AREMA CHAPTER 8.

P8. PLACE EPOXY COATED NO. 4 BENT "L" REINFORCEMENT BARS IN A 1'-0" CENTER-TO-CENTER MAXIMUM SPACED GRID. ANCHOR INTO SOUND CONCRETE WITH EPOXY ANCHORING SYSTEM.

P9. ATTACH E#5 BARS TO THE BENT "L" REINFORCEMENT BARS WITH ANNEALED IRON WIRE AT A MAXIMUM SPACING OF 1'-0" IN EACH DIRECTION. IN LIEU OF E#5 BARS, CONTRACTOR HAS OPTION TO UTILIZE WELDED WIRE FABRIC. IF USING 6X6 WELDED WIRE FABRIC, PLACE A SECOND LAYER OF 6X6 WELDED WIRE FABRIC AND STAGGER TO ACHIEVE 3X3 GRID SPACING. MINIMUM AREA OF WELDED WIRE FABRIC SHALL BE EQUAL TO OR GREATER THAN 0.24 IN/FT.

P10. REPAIR CONCRETE DAMAGED DURING REHABILITATION OPERATIONS TO THE SATISFACTION OF THE NORFOLK SOUTHERN RAILWAY COMPANY ENGINEER AT NO ADDITIONAL COST TO NORFOLK SOUTHERN RAILWAY COMPANY.

P11. PROPERLY DISPOSE COLLECTED CONCRETE, DEBRIS, AND ABRASIVE BLAST MEDIA.

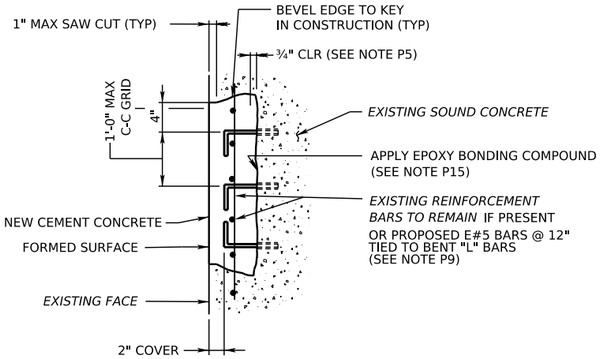
P12. SET FORMS TO PROVIDE MINIMUM CONCRETE COVER OF 2". HAUNCHED REHABILITATED CONCRETE WILL NOT BE PERMITTED. ALL REHABILITATED CONCRETE IS TO MAINTAIN THE EXISTING FACE OF THE RETAINING WALL.

P13. MAINTAIN ALL EXISTING CHAMFERS. WHERE EXISTING VERTICAL CONSTRUCTION JOINT SPACING EXCEEDS 20'-0", ESTABLISH NEW VERTICAL CONSTRUCTION JOINTS AT 20'-0" MAX SPACING.

P14. ESTABLISH NEW HORIZONTAL CHAMFERS AS SHOWN.

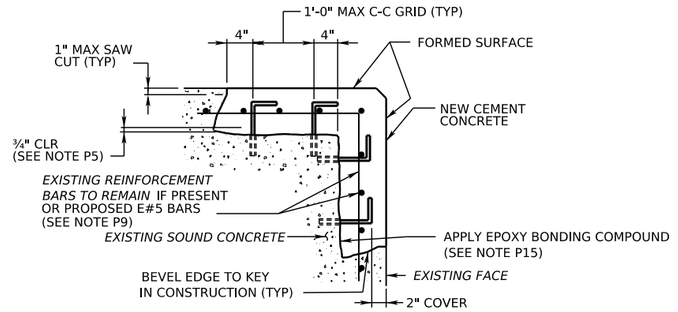
P15. AIR-BLAST REHABILITATION AREAS WITH OIL-FREE COMPRESSED AIR TO REMOVE ANY REMAINING CONTAMINANTS DETRIMENTAL TO THE BOND OF NEW CONCRETE. APPLY EPOXY BONDING COMPOUND TO REHABILITATION AREAS. WHILE EPOXY BONDING COMPOUND IS STILL TACKY, PLACE CEMENT CONCRETE WITH NO. 8 COARSE AGGREGATE. DO NOT PLACE CONCRETE IF COMPOUND IS NO LONGER TACKY OR HAS HARDENED. RECOAT COMPOUND THAT IS NO LONGER TACKY. WIRE BRUSH HARDENED COMPOUND AND RECOAT REHABILITATION AREAS.

P16. WATER CURE REHABILITATION AREAS.



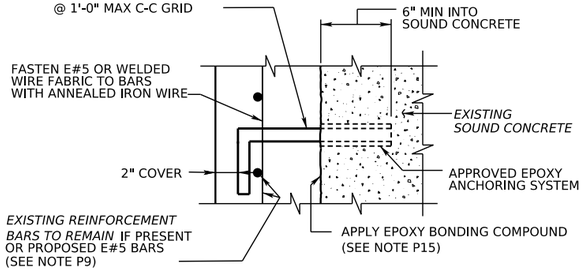
TYPICAL REHABILITATION DETAIL

NOT TO SCALE



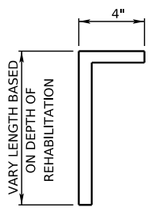
TYPICAL CORNER REHABILITATION DETAIL

NOT TO SCALE



TYPICAL "L" BAR DETAIL

NOT TO SCALE



BENT "L" BAR DETAIL

NOT TO SCALE

NOTES:

1. FOR GENERAL NOTES, SEE SHEET NO 1.
2. USE A PACHOMETER TO LOCATE EXISTING REINFORCEMENT WHEN DRILLING DOWEL HOLES TO AVOID DRILLING THRU EXISTING BARS.
3. IF EXISTING REINFORCEMENT IS PRESENT, CONTRACTOR SHALL SUPPLY SUFFICIENT ADDITIONAL REINFORCEMENT AS NECESSARY TO OBTAIN MINIMUM REINFORCEMENT OF E#5 @ 12" VERTICALLY AND HORIZONTALLY.

REHABILITATE DETERIORATED CONCRETE (FOR INFORMATION ONLY)	
(THIS ITEM INCLUDES PAYMENT FOR THE FOLLOWING MATERIALS AND THEIR INSTALLATIONS)	
DOWEL HOLES	SECTION 7 - CAST-IN-PLACE CONCRETE, DIAMETER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION
REINFORCEMENT BARS (EPOXY COATED)	SECTION 7 - CAST-IN-PLACE CONCRETE
EPOXY ANCHORING SYSTEM	IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION
WELDED WIRE FABRIC (WWF) (EPOXY COATED OR GALVANIZED)	SECTION 7 - CAST-IN-PLACE CONCRETE 3X3, 4X4, OR 6X6 WWF MADE OF 8, 10, OR 11 GAUGE WIRE
ANNEALED IRON WIRE	ASTM A684
FORMS	AREMA CHAPTER 8, 1.9
EPOXY BONDING COMPOUND	ASTM C881 TYPE II, GRADE 2 OR ASTM C882
CEMENT CONCRETE	SECTION 7 - CAST-IN-PLACE CONCRETE EXCEPT USE AASHTO NO. 8 COARSE AGGREGATE

NOTE: ANY ADDITIONAL REINFORCING STEEL IS INCIDENTAL TO REHABILITATE DETERIORATED CONCRETE.

Mark	Description	By	Chk'd	Recm'd.	Date
	REVISIONS				

DES: JWG | DWG: JWG | CKD: DMF

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL DANIEL M. FUHRMAN ENGINEER PE086975

AECOM
707 GRANT ST. SUITE 500
PITTSBURGH, PA 15219

NORFOLK SOUTHERN

KEYSTONE DIVISION

PC LINE RETAINING WALLS

OFFICE OF CHIEF ENGINEER - BRIDGES & STRUCTURES — ATLANTA, GA

CONCRETE REHABILITATION DETAILS

VAL SEC V1a | MAP 2 | DATE 11/15/2024

FILE BR1115573 | SHEET 15 OF 15

MILEPOST PC-0.78 TO PC-1.20 | DRAWING NO PC LINE 15

Addendum No. 9

Attachment C

APPENDIX E – SUPPLEMENTAL INFORMATION (FOR INFORMATION ONLY)

SECTION 5.5.4

- O-14 Flap Gate Improvements (14 sheets including Appendix E – Supplemental Information fly sheet) (ALCOSAN Contract 1617)

Addendum No. 9

Attachment C

APPENDIX E – SUPPLEMENTAL INFORMATION (FOR REFERENCE ONLY)

SECTION 5.5.4

Pages from ALCOSAN Contract 1617: O-14E Flap Gate Improvements Record Drawings and Submittal 46-A-3 Final O-14 Flap Gate and Frame:

- O-14E Pages from Contract 1617 Flap Gate Improvements Record Drawings (August 2016)
- 1617 Submittal 46-A-3 Final O-14 Flap Gate and Frame (March 2015)

ALLEGHENY COUNTY SANITARY AUTHORITY
PITTSBURGH, PENNSYLVANIA

CONTRACT NO. 1617
FLAP GATE IMPROVEMENTS
AT VARIOUS LOCATIONS

SHEET NO.	DRAWING TITLE	DRAWING CADD FILE NAME
1	TITLE SHEET	1617 COVER.DGN
2	GENERAL NOTES	1617 NOTES.DGN
3	A-51-00 GENERAL PLAN & DETAILS	1617 A-51 GENERAL PLAN & DETAILS.DGN
4	A-51-00 FLAP GATE REPLACEMENT DETAILS	1617 A-51 FLAP GATE REPLACEMENT DETAILS.DGN
5	M-10-00 GENERAL PLAN & DETAILS	1617 M-10 GENERAL PLAN & DETAILS.DGN
6	M-10-00 SITE IMPROVEMENT PLAN	1617 M-10 SITE IMPROVEMENT PLAN.DGN
7	M-10-00 FLAP GATE REPLACEMENT DETAILS	1617 M-10 FLAP GATE REPLACEMENT DETAILS.DGN
8	M-12-00 GENERAL PLAN AND DETAILS / FLAP GATE REPLACEMENT	1617 M-12 GENERAL PLAN & DETAILS.DGN
9	M-27-00 TIDEFLEX INSTALLATION / STRUCTURE MODIFICATION - PLAN	1617 M-27 TIDEFLEX INSTALLATION PLAN.DGN
10	M-27-00 TIDEFLEX INSTALLATION / STRUCTURE MODIFICATION - SECTIONS	1617 M-27 TIDEFLEX INSTALLATION SECTIONS.DGN
11	M-35-00 GENERAL PLAN & DETAILS	1617 M-35 GENERAL PLAN & DETAILS.DGN
12	M-35-00 FLAP GATE REPLACEMENT DETAILS	1617 M-35 FLAP GATE REPLACEMENT DETAILS.DGN
13	O-14-E GENERAL PLAN	1617 O-14E GENERAL PLAN.DGN
14	O-14-E FLAP GATE REPLACEMENT DETAILS	1617 O-14E FLAP GATE REPLACEMENT DETAILS.DGN
15	O-15-00 GENERAL PLAN & DETAILS / FLAP GATE REPLACEMENT	1617 0-15 GENERAL PLAN AND DETAILS.DGN

DRAWN BY: ED3

CHECKED BY: BGD

EXAMINED BY:

Michael Baker
INTERNATIONAL
AIRSIDE BUSINESS PARK
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108

alcosan allegheny county sanitary authority

ARLETTA SCOTT WILLIAMS
EXECUTIVE DIRECTOR, ALCOSAN

REV.	DESCRIPTION	DATE	APP.
5			
4			
3			
2			
1	RECORD DRAWING	8/1/16	BGD

ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
PITTSBURGH, PENNSYLVANIA

CONTRACT 1617

FLAP GATE IMPROVEMENTS
AT VARIOUS LOCATIONS

TITLE SHEET

SCALE: AS SHOWN CONTRACT NO. 1617 SHEET 1 OF 15

FILENAME: 1617 COVER.DGN
DATE PLOTTED: 10/3/2016
DRAWING NO.:

SCOPE OF WORK:

1. DEMOLITION INCLUDED REMOVAL OF EXISTING CAST IRON FRAME AND BAR SEAT AT GATE O-14E-00.
   DEMOLITION AT FLAP GATES A-51-00, M-10-00 AND M-35-00 INCLUDED REMOVAL OF THE EXISTING GATE COVER ONLY.
2. FURNISHED AND INSTALLED NEW FABRICATED 304 SS GATE COVERS AT FLAP GATES A-51-00, M-10-00, M-35-00 AND O-14E-00.
3. FURNISHED AND INSTALLED NEW HEAVY DUTY FLAP GATES AT DIVERSION CHAMBERS M-12-00 AND O-15-00.
4. FURNISHED AND INSTALLED NEW TIDEFLEX VALVE AT M-27-00
5. STRUCTURE MODIFICATIONS AND ADDITION OF BILLCO DOORS AT SITES A-51, M-10, M-12, M-35 AND O-14E.

SPECIAL REQUIREMENTS:

1. THE CONTRACTOR WAS RESPONSIBLE FOR VERIFYING ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO ORDERING THE GATES AND REPORTING TO THE ENGINEER ANY AND ALL CONDITIONS WHICH MAY INTERFERE OR OTHERWISE AFFECT OR PREVENT THE PROPER EXECUTION OF THE WORK.
2. THE CONTRACTOR WAS RESPONSIBLE FOR MAINTAINING THE OUTLET STRUCTURE DURING THE EXECUTION OF WORK AND DURING ALL WET WEATHER EVENTS.
3. THE CONTRACTOR WAS RESPONSIBLE FOR PROVIDING AND MAINTAINING TEMPORARY PUMPING FACILITIES TO DEWATER THE AREA OF WORK AND PROVIDED ADDITIONAL PUMPS, BULKHEADS, COFFERDAMS, MATERIALS AND EQUIPMENT AS NECESSARY TO PROVIDE FOR A DRY INSTALLATION.

FABRICATED DRAINAGE FLAP VALVES – SECTION 15101 (A-51-00, M-10-00, M-35-00 AND O-14E-00):

1. FABRICATED FLAP VALVES ARE BY RODNEY HUNT COMPANY, 304 STAINLESS STEEL, WITH NEOPRENE SEATS.
2. FABRICATED 304 SS FLAP VALVE COVERS HAVE A NEOPRENE SEAT WITH A RESILIENT LIP SEAL BOLTED TO THE FRAME USING STAINLESS STEEL RETAINER BARS AND BOLTS.
3. THE EXISTING STAINLESS STEEL BAR SEATS ON STRUCTURE WALLS WERE CLEANED AND RE-UTILIZED AT A-51-00, M-10-00 AND M-35-00.
4. THE FABRICATED FLAP VALVE AT O-14E INCLUDED A NEW STAINLESS STEEL FRAME AND BAR SEAT TO REPLACE THE EXISTING CORRODED CAST IRON FRAME AND SEAT.
5. AT A-51, M-10 AND M-35, FLAP VALVE COVERS WERE REPLACED AND DESIGNED TO SEAL AGAINST EXISTING BAR SEATS.
6. EXISTING HINGE COMPONENTS WERE REPLACED, WITH EXCEPTION OF WALL MOUNTED PIVOT BRACKETS.

HEAVY DUTY FLAP GATES – SECTION 15102 (M-12-00 AND O-15-00):

1. HEAVY DUTY FLAP GATES WERE WATERMAN CAST IRON FLAP VALVES OF THE SIZE INDICATED ON THE DRAWINGS. THE FLAP VALVES ARE FLANGE FRAMED WITH BRONZE SEATING ELEMENTS.
2. FRAME AND COVER ARE CAST IRON, ASTM A126, CLASS B.
3. HINGE ARMS ARE HIGH TENSILE MANGANESE BRONZE, ASTM B584 ALLOY 865.
4. GATES ARE OF THE DOUBLE PIVOT HINGE DESIGN, FULL OPENING, AND WITH STOPS TO PREVENT COVER FROM ROTATING SUFFICIENTLY TO BECOME WEDGED IN THE OPEN POSITION.
5. AT O-15-00, THE FRAME BODY IS FLAT BACKED AND IS CAST IN ONE PIECE, MOUNTED TO A VERTICAL CONCRETE WALL USING EPOXY ADHESIVE ANCHORS, HILTI RE 500-SD, 6 1/2" MIN. EMBEDMENT.
6. SEATING SURFACES FOR THE FRAME AND COVER ARE BRONZE SEATS IMPACTED INTO MACHINED DOVETAIL GROOVES.
7. M-12 FLAP VALVE WAS MOUNTED TO A FLANGED DUCTILE IRON WALL PIPE.

NOTES:

1. CAST IRON FLAP VALVES M-12-00 AND O-15-00 WERE CAST AND FABRICATED BY THE WATERMAN COMPANY, INC.
2. 304 SS FLAP VALVE COVERS A-51-00, M-10-00, M-35-00 AND O-14E-00 WERE FABRICATED BY THE RODNEY HUNT CO., INC.
3. CAST IRON FLAP VALVES, 304 SS FLAP VALVE COVERS AND TIDEFLEX VALVE WERE INSTALLED BY INDEPENDENT ENTERPRISES, INC.
4. SHOP DRAWINGS FOR FABRICATED FLAP VALVES WERE CREATED BY RODNEY HUNT CO., INC. UNDER ALCOSAN CONTRACT 1617 TO INDEPENDENT ENTERPRISES, INC.
5. DESIGN OF STRUCTURE MODIFICATIONS WAS BY GATEWAY ENGINEERS UNDER CONTRACT WITH INDEPENDENT ENTERPRISES, INC. WHERE APPLICABLE, REFERENCES TO GATEWAY DRAWINGS NUMBERS ARE INDICATED ON THE ALCOSAN RECORD DRAWINGS.
6. CONSTRUCTION MANAGER WAS MICHAEL BAKER INTERNATIONAL.
7. RECORD DRAWINGS OF AS-BUILT CONDITIONS BY MICHAEL BAKER INTERNATIONAL. INFORMATION ON EXISTING ALCOSAN STRUCTURES IS SHOWN BASED ON ALCOSAN RECORD DRAWINGS AS SPECIFICALLY NOTED ON EACH DRAWING.
8. KEY INFORMATION AND INSTALLATION DATES ARE AS FOLLOWS:

Location	Gate	Size	Date Installed
A-51	Rodney Hunt	48" W x 60" H	11/19/2015
M-10	Rodney Hunt	60"W x 66" H	11/5/2015
M-12	Waterman Industries	24" Round	3/25/2015
M-27	Tideflex	48" Round	4/3/2015
M-35	Rodney Hunt	49" x 49"	2/10/2016
O-14-E	Rodney Hunt	48" x 48"	11/16/2015
O-15	Waterman Industries	24" X 24"	11/17/2015

DRAWN BY: ED3

CHECKED BY: BGD

EXAMINED BY:

Michael Baker
INTERNATIONAL
AIRSIDE BUSINESS PARK
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108

alcosan allegheny county sanitary authority
ARLETTA SCOTT WILLIAMS
EXECUTIVE DIRECTOR, ALCOSAN

REV.	DESCRIPTION	DATE	APP.
5			
4			
3			
2			
1	RECORD DRAWING	8/1/16	BGD

ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
PITTSBURGH, PENNSYLVANIA

CONTRACT 1617

FLAP GATE IMPROVEMENTS AT VARIOUS LOCATIONS

GENERAL NOTES

SCALE: AS SHOWN CONTRACT NO. 1617 SHEET 2 OF 15

FILENAME: 1617 NOTES.DGN
DATE PLOTTED: 9/30/2016
DRAWING NO.:

30" ERGO XL WATERTIGHT MANHOLE FRAME & COVER WITH CONCRETE APRON ADDED TO VENT MANHOLE (BEYOND VIEW)

42 RCP SEWER TO RIVER HEADWALL

RODNEY HUNT FLAP GATE 48" W x 48" H

NOTE

SS SLIDE PLATE, ANGLES AND FRAMING PLATES TO BE MINIMUM ⅜" THICK. SLIDE PLATE TO BE 2'-6" HIGH WITH WELDED-ON LIFTING HANDLE. FRAMING ANGLES ON INTERIOR OF OPENING TO EXTEND FOR THE FULL HEIGHT OF THE OPENING AND FRAMING ON THE OUTSIDE OF THE OPENING TO EXTEND 2'-9" FROM THE BOTTOM OF THE OPENING. PROVIDE FLAT BOTTOM AREA FOR PROPER SEATING OF THE SLIDE PLATE. ANCHOR BOLTS TO BE MINIMUM 1/2" ϕ SPACED AT 9" ON CENTERS MAXIMUM. ANGLES TO BE 3" x 3" ANG FRAMING PLATES TO EXTEND AT LEAST 3" PAST END OF SLIDE PLATE.

SS SLIDE PLATE SEE NOTE

SS ANGLES

SLOPE

ANCHOR BOLTS

SS FRAMING PLATES

TIPPING PLATE REGULATOR (3 REQ'D)

32-C

#5 'S' @ 12" S/C (DOWELS FOR CONC FILLETS)

INSTALL BULKHEAD

CUT OPENING IN EXISTING WALL FOR NEW CHANNEL AND PATCH WITH CLASS A CONC TO SMOOTH SURFACE

SEWER ENVELOPE UP TO ℄ OF INFLUENT BOX CULVERT

ABANDON EXIST TROUGH

EXIST 48" RCP SEWER

BOX CULVERT

EXISTING 12" RCP SEWER

EXISTING 42" RCP SEWER

EXIST BRICK GATE OPENING

EXISTING DIVERSION STRUCTURE

EXISTING DIVERSION CHAMBER

SECTION 34-A

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

For As Built Change See Contract 675 Sh. 2A of 6 For Ref. See Field Book 146C Pages 10, 11

For As Built Change At 42" Box Culvert See Cont. 675 Sh. 2A of 6 For Ref. See Field Book 146C Page 66

30" ERGO XL WATERTIGHT MANHOLE FRAME & COVER WITH CONCRETE APRON

30" ERGO XL WATERTIGHT MANHOLE FRAME & COVER WITH 6" CONCRETE APRON

PRECAST CONCRETE COVER

NEW PRECAST CONCRETE STOP LOG SLOT COVER

CAST IN PLACE REINFORCED CONCRETE RISER FOR DOOR

BILLCO DOOR, 62" X 47", H-20 RATED

12" VENT PIPE

EXISTING POWER POLE

℄ PRECAST MANHOLE

℄ EXISTING DIVERSION STRUCTURE (CITY OF PITTSBURGH) REFERENCE DRAWINGS CITY OF PITTSBURGH DWG NO'S ACCESSION D0312 CASE NO. 15-14-1 SHEET 11 OF 11 & 3 OF 11

TOP PLAN - 34-B

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

ALCOSAN DRAWING REFERENCES:

1. CONTRACT 675, SAW MILL RUN DIVERSION CHAMBER MODIFICATIONS (6 SHEETS) , DATED JUNE, 1981

SHOP DRAWING REFERENCES:

1. GATE: THE RODNEY HUNT COMPANY, DWG. NOS. 80932, 80933, 80934, 80935, 80936
2. STRUCTURE MODIFICATION: GATEWAY ENGINEERS DRAWING S.101
3. DOOR: THE BILLCO COMPANY, DWG. NO. JD-16335

DRAWN BY: ED3

CHECKED BY: BGD

EXAMINED BY:

Michael Baker INTERNATIONAL
AIRSIDE BUSINESS PARK
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108

alcosan allegheny county sanitary authority

ARLETTA SCOTT WILLIAMS
EXECUTIVE DIRECTOR, ALCOSAN

REV.	DESCRIPTION	DATE	APP.
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4			
3			
2			
1	RECORD DRAWING	8/1/16	BGD

ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
PITTSBURGH, PENNSYLVANIA

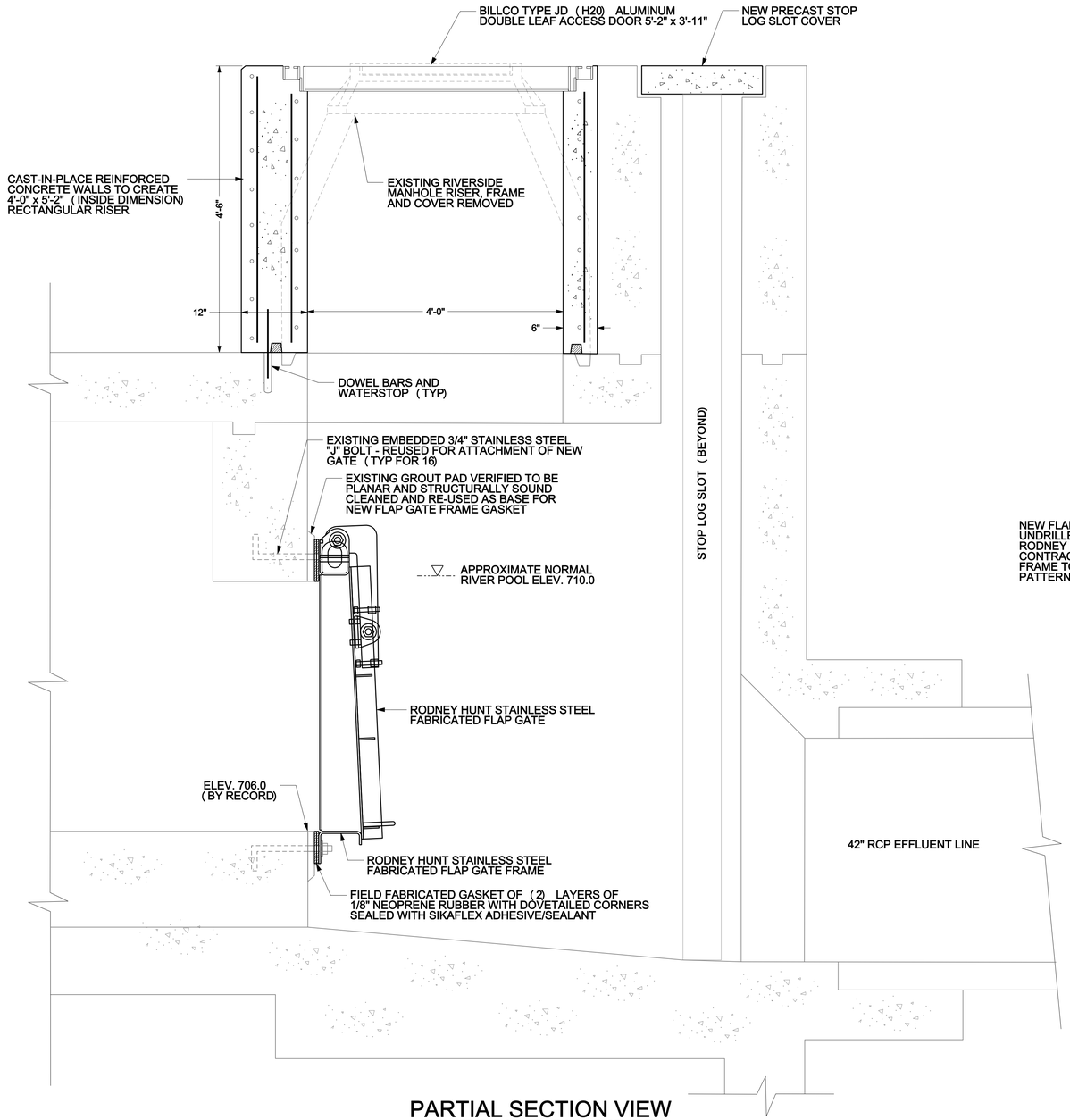
CONTRACT 1617

FLAP GATE IMPROVEMENTS AT VARIOUS LOCATIONS

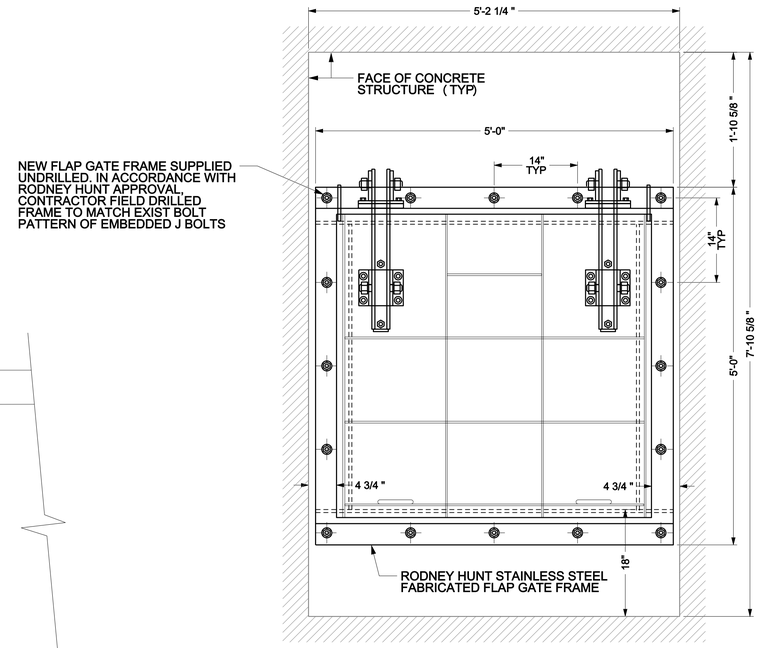
DIVERSION O-14E-00 GENERAL PLAN

SCALE: AS SHOWN CONTRACT NO. 1617 SHEET 13 OF 15

FILENAME: 1617 O-14E GENERAL PLAN.DGN
DATE PLOTTED: 9/12/2016
DRAWING NO.:



PARTIAL SECTION VIEW RIVERSIDE CHAMBER



FRONT VIEW

1' 0 1' 2'

SCALE IN FEET

ALCOSAN DRAWING REFERENCES:

1. CONTRACT 675, SAW MILL RUN DIVERSION CHAMBER MODIFICATIONS, DATED JUNE, 1981

SHOP DRAWING REFERENCES:

1. GATE: THE RODNEY HUNT COMPANY, DWG. NOS. 80932, 80933, 80934, 80935, 80936
2. STRUCTURE MODIFICATION: GATEWAY ENGINEERS DRAWING S.101
3. DOOR: THE BILLCO COMPANY, DWG. NO. JD-16335

DRAWN BY: ED3

CHECKED BY: BGD

EXAMINED BY:

Michael Baker INTERNATIONAL
AIRSIDE BUSINESS PARK
100 AIRSIDE DRIVE
MOON TOWNSHIP, PA 15108

alcosan allegheny county sanitary authority

ARLETTA SCOTT WILLIAMS
EXECUTIVE DIRECTOR, ALCOSAN

REV.	DESCRIPTION	DATE	APP.
5			
4			
3			
2			
1	RECORD DRAWING	8/1/16	BGD

ALLEGHENY COUNTY SANITARY AUTHORITY
WASTEWATER TREATMENT PLANT
PITTSBURGH, PENNSYLVANIA

CONTRACT 1617

FLAP GATE IMPROVEMENTS AT VARIOUS LOCATIONS DIVERSION O-14E-00 FLAP GATE DETAILS

SCALE: AS SHOWN CONTRACT NO. 1617 SHEET 14 OF 15

FILENAME: 1617 O-14E FLAP GATE DETAILS.DGN
DATE PLOTTED: 9/12/2016
DRAWING NO.:

INDEPENDENT ENTERPRISES, INC.
GENERAL CONTRACTOR
5020 THOMS RUN ROAD OAKDALE, PA. 15071 412.221.3435 FAX412.221.4430

CONTRACT: ***Allegheny County Sanitary Authority Flap Gate Improvements at Various Locations***

CONTRACT NUMBER: ***#1617***

SUBMITTAL # 46-A-3

SECTION AND PARAGRAPH:

MANUFACTURE: RODNEY HUNT

ITEM: O-14 FLAP GATE

Reviewed and Approved: JSC TJF
Jack S. Cargnoni, President

Date: 3/16/15

VAG Valve and Gate Group

March 9, 2015

Independent Enterprises, Inc.
5020 Thomas Run Road
Oakdale, PA 15071

Attention: Timothy Frew

Subject: Alcosan – Pittsburg, PA
Your Purchase Order No. 90009
Rodney Hunt Shop Order No. 5140665
Response to 3/3/15 Questions from the Engineer

Dear Tim,

Below are the responses from RHF to the questions raised by Baker on 3/3/15:

1. Contractor to provide.
2. Please see the enclosed letter. The frame of the flap valves have been design to be drilled in the field (as shown on submittal drawing E-80934). The warranty from RHF will not be affected if the holes are drilled without damaging the gate and in a manner that is industry standard for a water control gate.
3. It is permitted, but not recommended by RHF to reuse the existing grout pad to mount the new flap valves. It is extraordinarily difficult to remove an existing gate and leave the grout pad with no cracks or damage. Many times we have been called to fix a "leaking gate" to find that it was the grout pad (either an old one reused or a new one incorrectly constructed). However, if the existing grout pad is reused, the RHF warranty will not be affected.

If you have any questions or require additional information please let us know.

Sincerely,

Rodney Hunt Fontaine

Justin L. Dechen, P.E.
Senior Design Engineer

Encl: Field Modification Warranty Letter (1 pg.)

cc: Learco Inc.

GA INDUSTRIES RODNEY HUNT Fontaine

Rodney Hunt-Fontaine Inc.
46 Mill Street • Orange • MA 01364
Phone (978) 544-2511• Fax (978) 544-7204
www.vag-usa.com

FIELD MODIFICATION

Alcosan – Pittsburg, PA
Independent Enterprises, Inc.
Rodney Hunt Shop Order No. 5140665

As requested to accommodate field conditions, Rodney Hunt Fontaine instructs the contractor to perform the following field modification to gates provided on the order:

- Contractor is to field drill the back flange on the frame of the self-contained flap valves to match the existing bolt pattern in the field

- The flanges of the gate have been designed to work with the approximate location of the existing anchors. If an interference between the gate and anchor placement are discovered, please contact RHF for consultation.

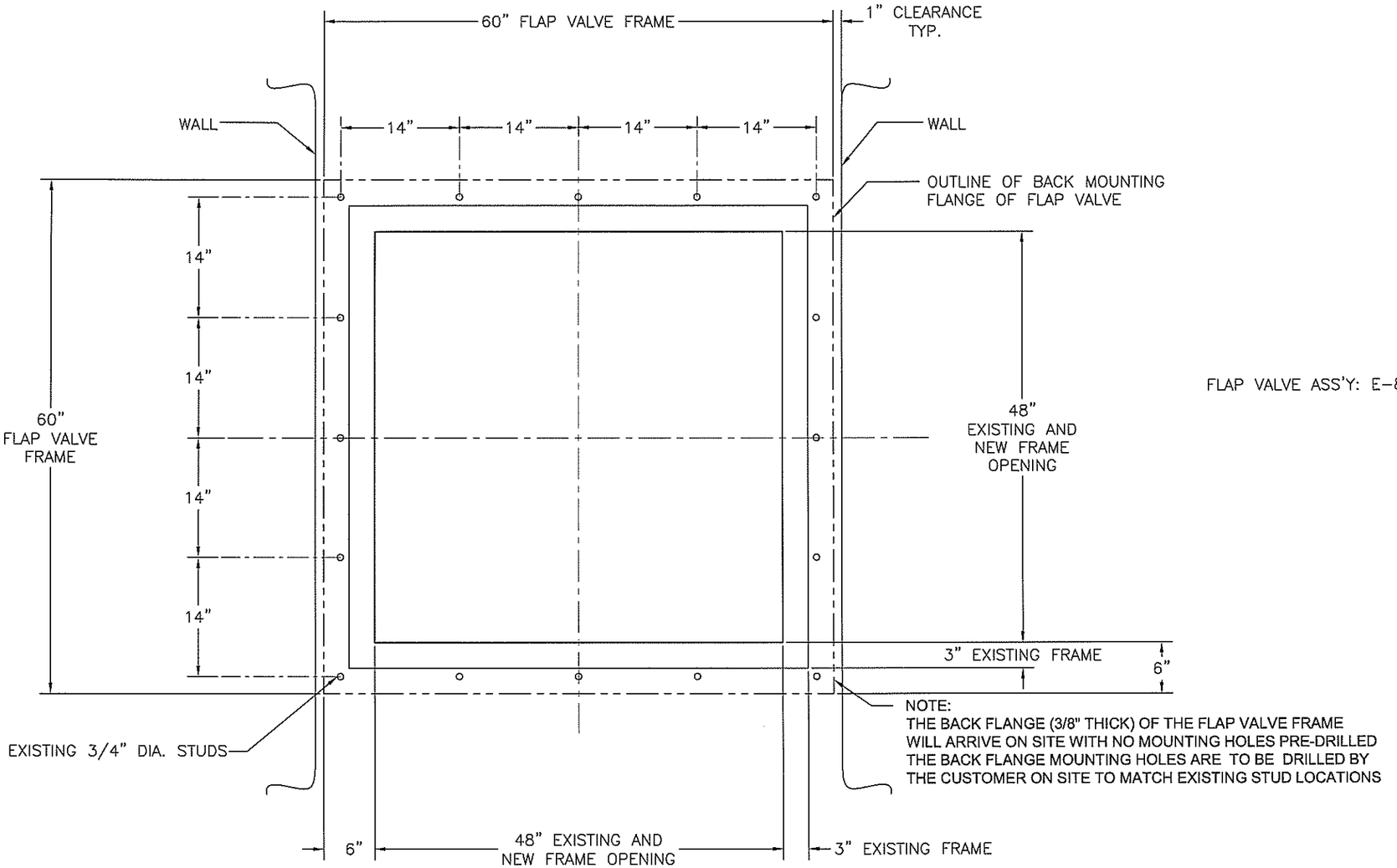
- All cut or sharp edges on the gate created by this work shall be rounded and smoothed by the contractor

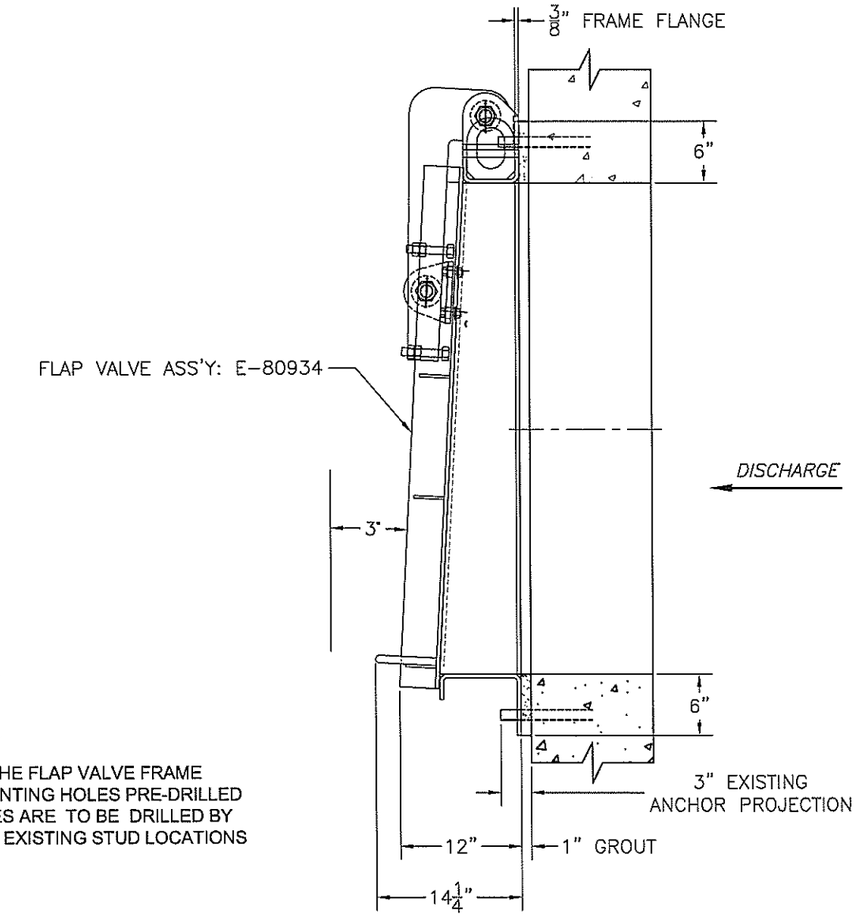
If the work detailed above is correctly done, the warranty period from Rodney Hunt Fontaine will not be affected. Please contact me with any further questions.

Certified:
RODNEY HUNT FONTAINE

Justin L. Dechen, P.E.
Senior Design Engineer

9/9/15





ALT	CHANGE	BY	CHK	DATE

PROJECT: ALCOSAN

PITTSBURG, PA

LOCATION: O-14

EQUIP./GATE No.: _____ QTY.: 1 ITEM No.: 1

FOR MATERIALS, SEE SPECIFICATION SHEET: 5140665-3

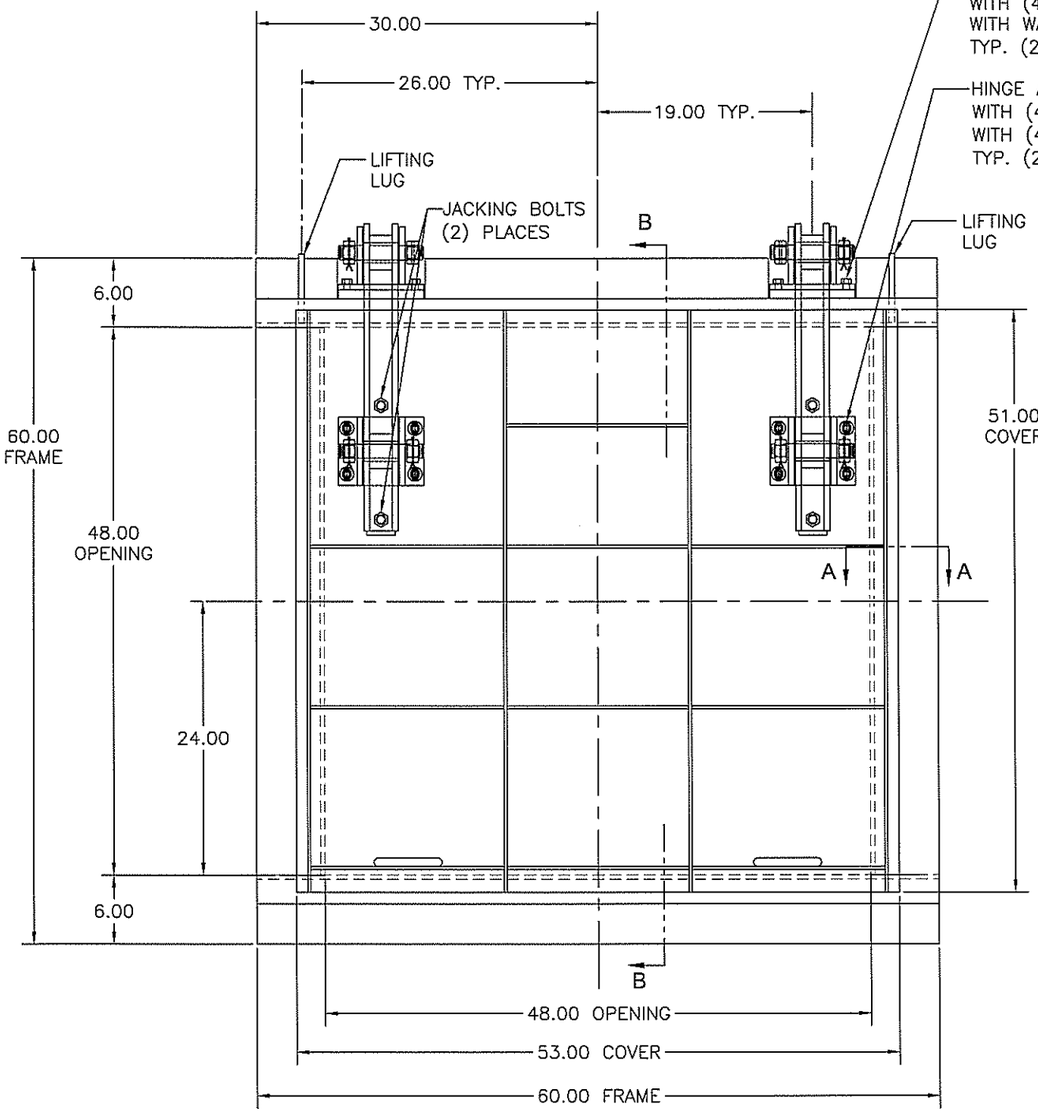
RODNEY HUNT COMPANY ORANGE, MA. 01364-1251

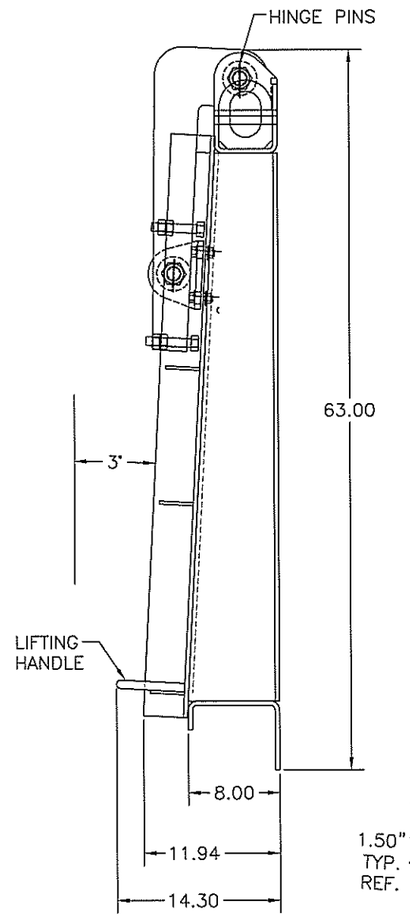
INST: 48" X 48"

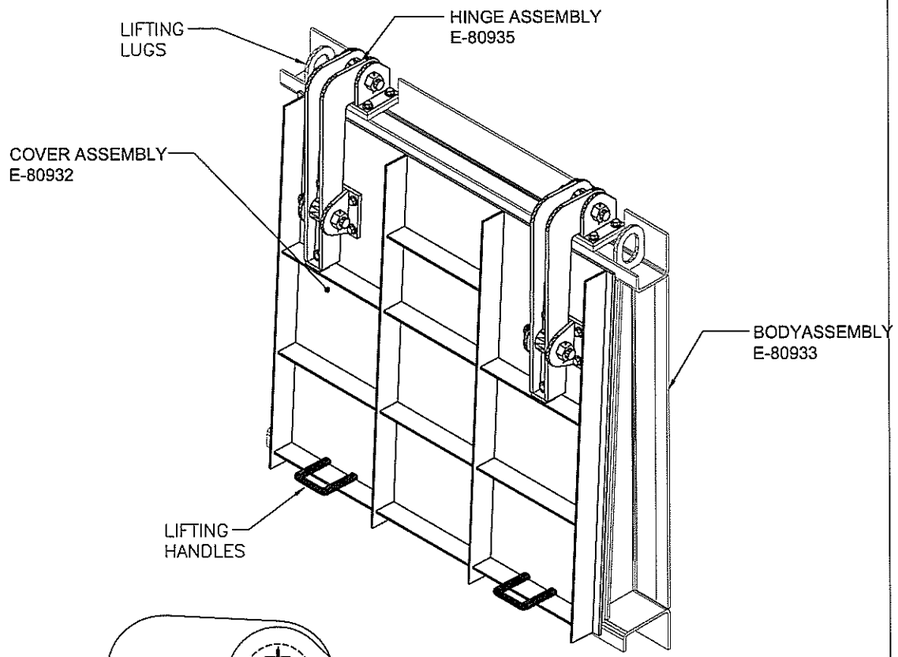
S.S. FABRICATED FLAP VALVE

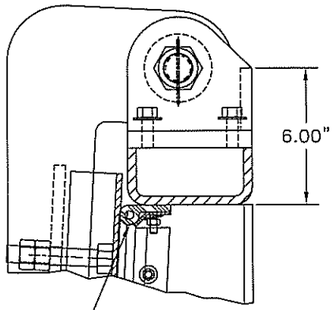
FOR: INDEPENDANT ENTERPRISES

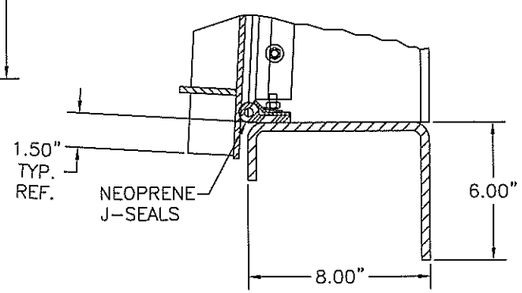
DRAWN SEP	DESIGNED JLD	DATE 2/12/15
CHECKED CHV	APPROVED	SCALE N.T.S.
ORDER NO. 5140665-3		DWG. NO. E-80936



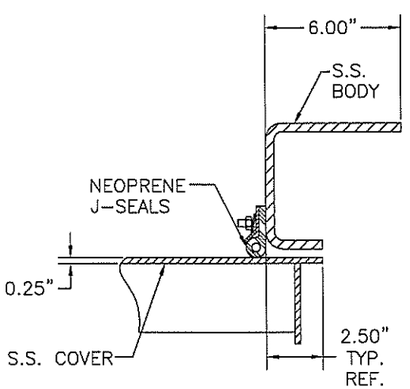








SECTION B-B



SECTION A-A

REF.
BACK FLANGE TO BE DRILLED BY THE CUSTOMER ON SITE TO MATCH EXISTING STUDS

TOLERANCE UNLESS OTHERWISE SPECIFIED			
DEC. DIM.	MACHINE	CAST	FABRICATE
1 PLACE	±0.060	±0.250	±0.250
2 PLACE	±0.030	±0.125	±0.125
3 PLACE	±0.015	±0.050	±0.060
ANGLE	±1°0'	±2'0"	±2'0"

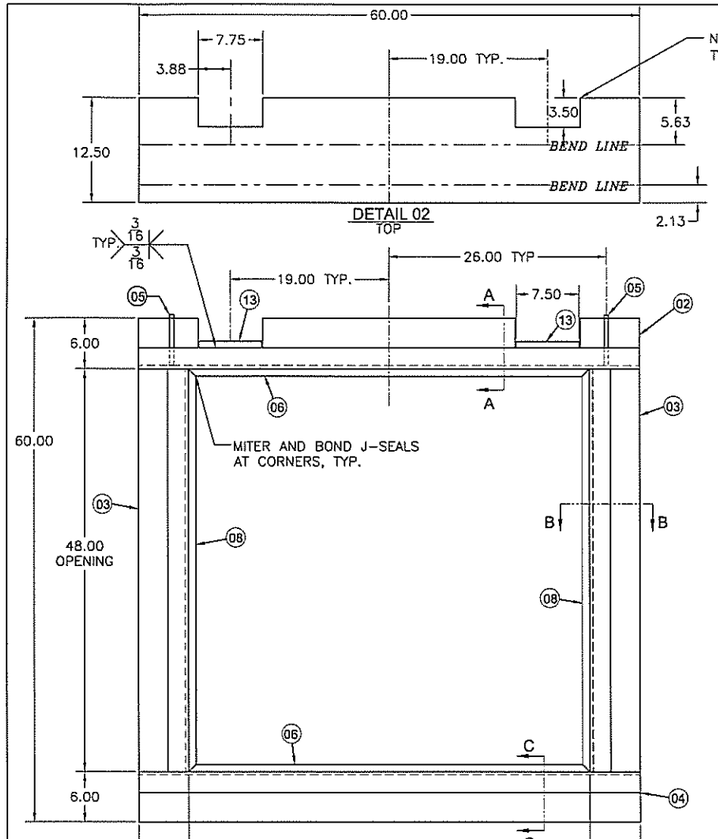
ALT	CHANGE	BY	CKD	DATE

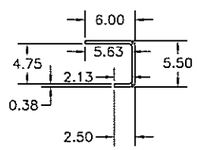
ALT	CHANGE	BY	CKD	DATE

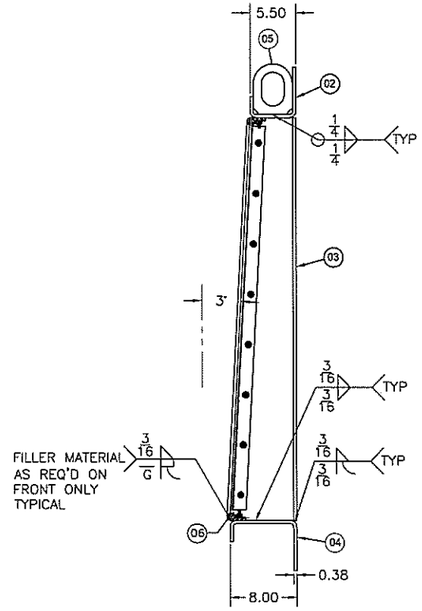
RODNEY HUNT COMPANY ORANGE, MA. 01364-1251

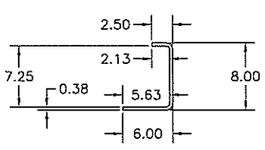
ASS'Y: 48" X 48" S.S. FABRICATED			
FLAP VALVE ASSEMBLY			
FOR: INDEPENDANT ENTERPRISES, ITEM #1			
DRAWN SEP	DESIGNED JLD	DATE 2/12/15	
CHECKED CHU	APPROVED	SCALE N.T.S.	
INDEX SYMBOL	ORDER NO. 5140665	DWG. NO. E-80934	

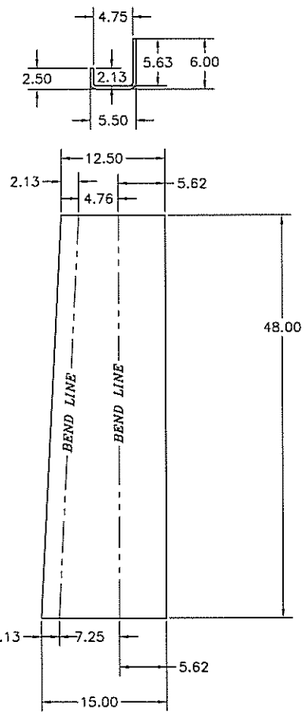
O:\Projects\Novell Transferred Data\FLEXVLV\FABRICATED\S140665 INDEPENDANT ENTERPRISES\ASSY\E80934_048X048_Item_1.dwg, 2/17/2015 9:30:51 AM, \\QOR03\POR00010 (Xerox 5335 - Engineering)

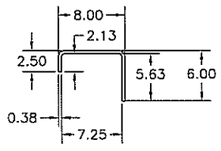




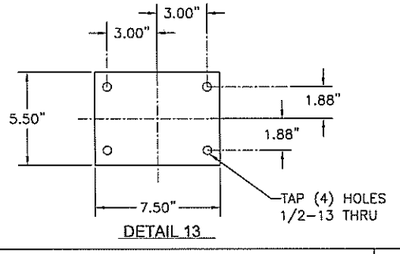




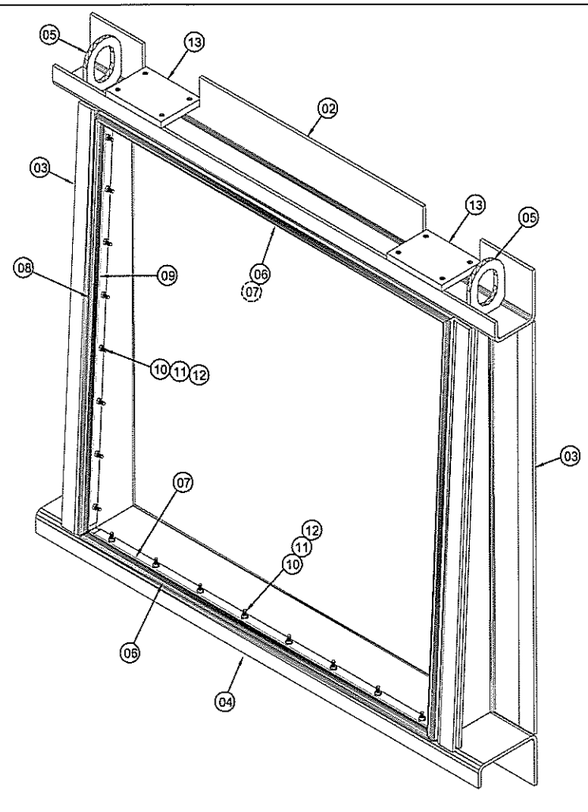




DETAIL 03 SIDES
FORM (1) L.H.
FORM (1) R.H.

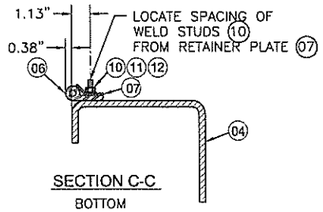


DETAIL 13



SECTION A-A
TOP

SECTION B-B
SIDES



SECTION C-C
BOTTOM

TOLERANCE UNLESS OTHERWISE SPECIFIED			
DEC. DIM.	MACHINE	CAST	FABRICATE
1 PLACE	±0.060	±0.250	±0.250
2 PLACE	±0.030	±0.125	±0.125
3 PLACE	±0.015	±0.060	±0.060
ANGLE	±1°0'	±2'0"	±2'0"

ALT	CHANGE	BY	CKD	DATE

ALT	CHANGE	BY	CKD	DATE

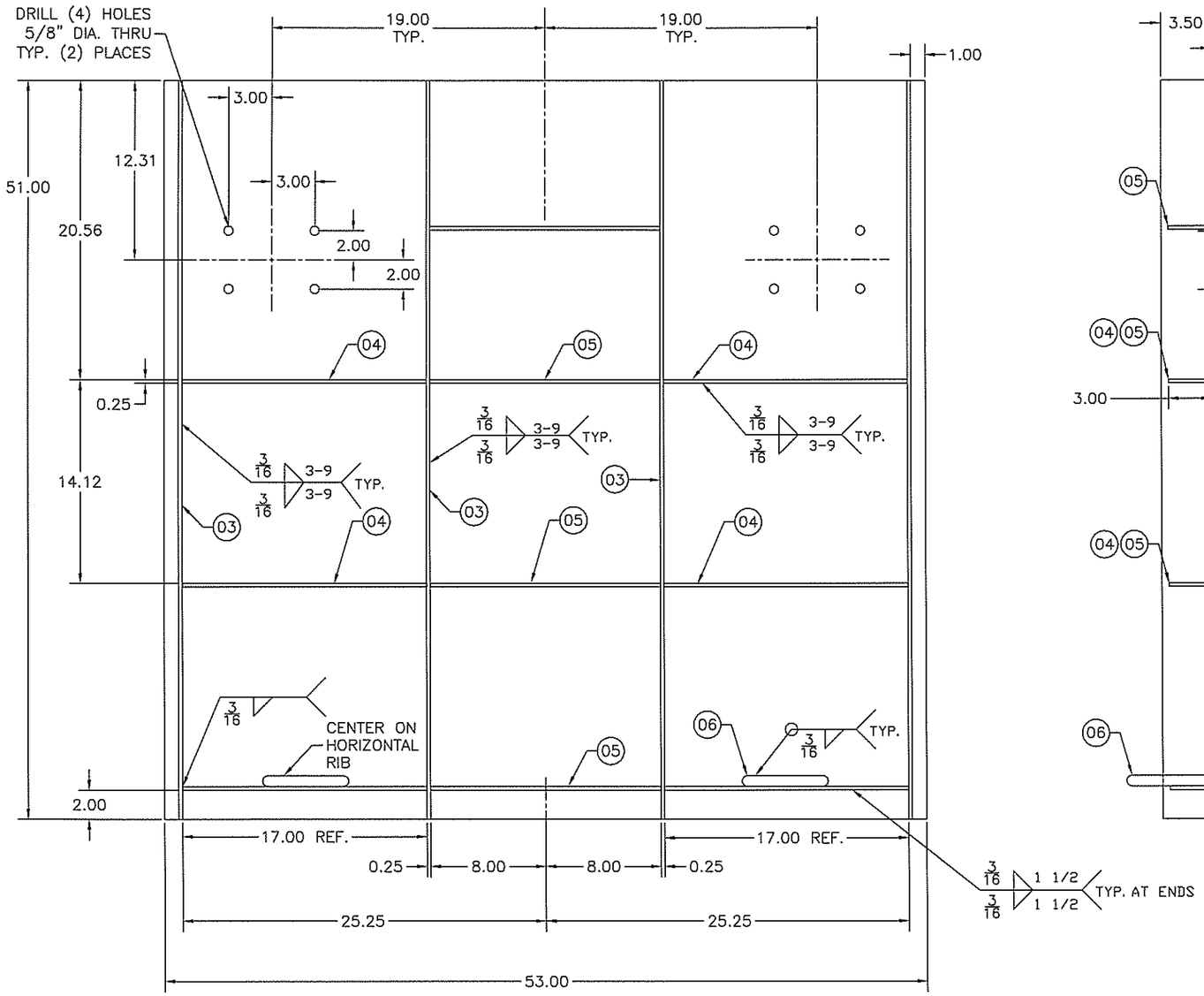
TOP	02	PLATE: 0.38 X 12.50 X 60.00" LG SHEAR CUT, FORM PER DETAIL	S. S.	1	REQ'D
SIDES	03	PLATE: 0.38 X 15.00 X 48.00" LG. SHEAR CUT FORM PER DETAIL	S. S.	2	REQ'D
BOTTOM	04	PLATE: 0.38 X 15.00 X 60.00" LG SHEAR CUT FORM PER DETAIL	S. S.	1	REQ'D
	05	LIFTING LUGS F-12777 PLATE: 0.50 X 4.75 X 6.00 LG	S. S.	2	REQ'D
	06	HORIZONTAL J-SEALS F-10586 X 48.00" LG.	NEOP	2	REQ'D
	07	HORIZONTAL RETAINER PLATE: F=11585 X 46.00" LG. A=46.00, B=6.00, C=2.00, D=8	S. S.	2	REQ'D
	08	VERTICAL J-SEALS F-10586 X 48.00" LG	NEOP	2	REQ'D
	09	VERTICAL RETAINER PLATE: F=11585 X 46.00" LG. A=46.00, B=6.00, C=2.00, D=8	S. S.	2	REQ'D
	10	WELD STUDS 0.31 X 1.25" LG.	S. S.	32	REQ'D
	11	WASHER FLAT 0.38 STD.	S. S.	32	REQ'D
	12	HEX NUT: 0.31-18 UNC	S. S.	32	REQ'D
	13	PLATE: 0.75 X 5.50 X 7.50 PROCESS PER DETAIL	S. S.	2	REQ'D

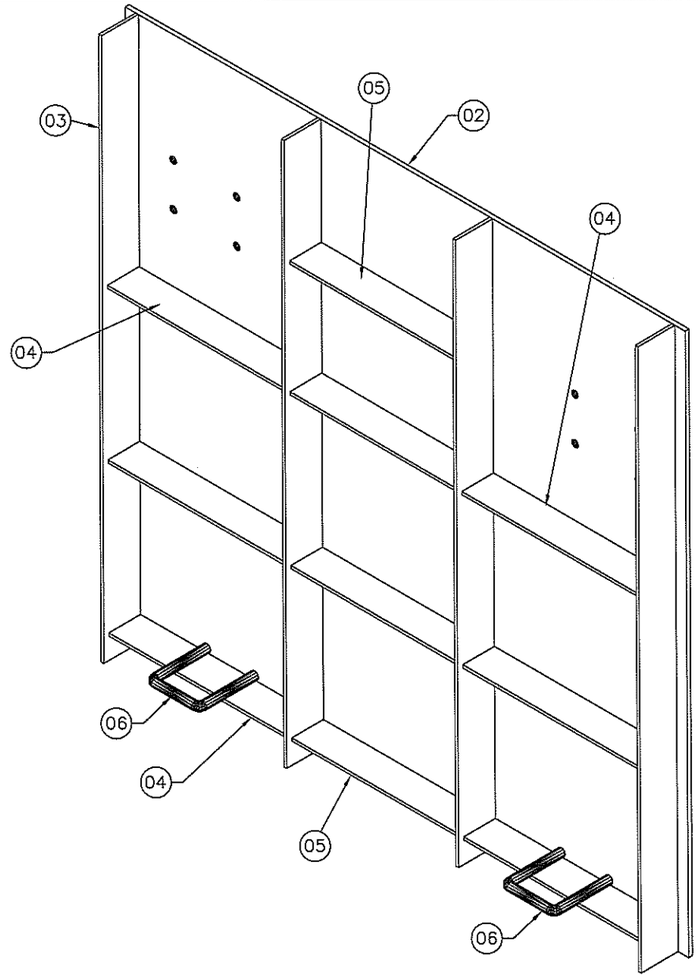
RODNEY HUNT COMPANY ORANGE, MA. 01364-1251

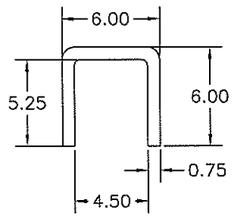
INDEX SYMBOL

ASS'Y: 48" X 48" S.S. FABRICATED
FLAP VALVE BODY WITH J-SEALS
FOR: INDEPENDANT ENTREPRISES, ITEM #1

DRAWN SEP	DESIGNED JLD	DATE	12/11/15
CHECKED CbU	APPROVED	SCALE	N.T.S.
ORDER NO. 5140665-3		DWG. NO.	E-80933







DETAIL 06

02	PLATE: 0.38 X 53.00 X 51.00" LG.	S.S.	1	REQ'D
03	BAR: 0.25 X 3.50 X 51.00" LG.	S.S.	4	REQ'D
04	BAR: 0.25 X 3.00 X 17.00" LG.	S.S.	6	REQ'D
05	BAR: 0.25 X 3.00 X 16.00" LG.	S.S	4	REQ'D
06	BAR ROUND 0.75 DIA. X 15.00" LG. BEND PER DETAIL	S.S.	2	REQ'D

TOLERANCE UNLESS OTHERWISE SPECIFIED			
DEC. DIM.	MACHINE	CAST	FABRICATE
1 PLACE	±0.060	±0.250	±0.250
2 PLACE	±0.030	±0.125	±0.125
3 PLACE	±0.015	±0.060	±0.060
ANGLE	±1°0'	±2'0"	±2'0"

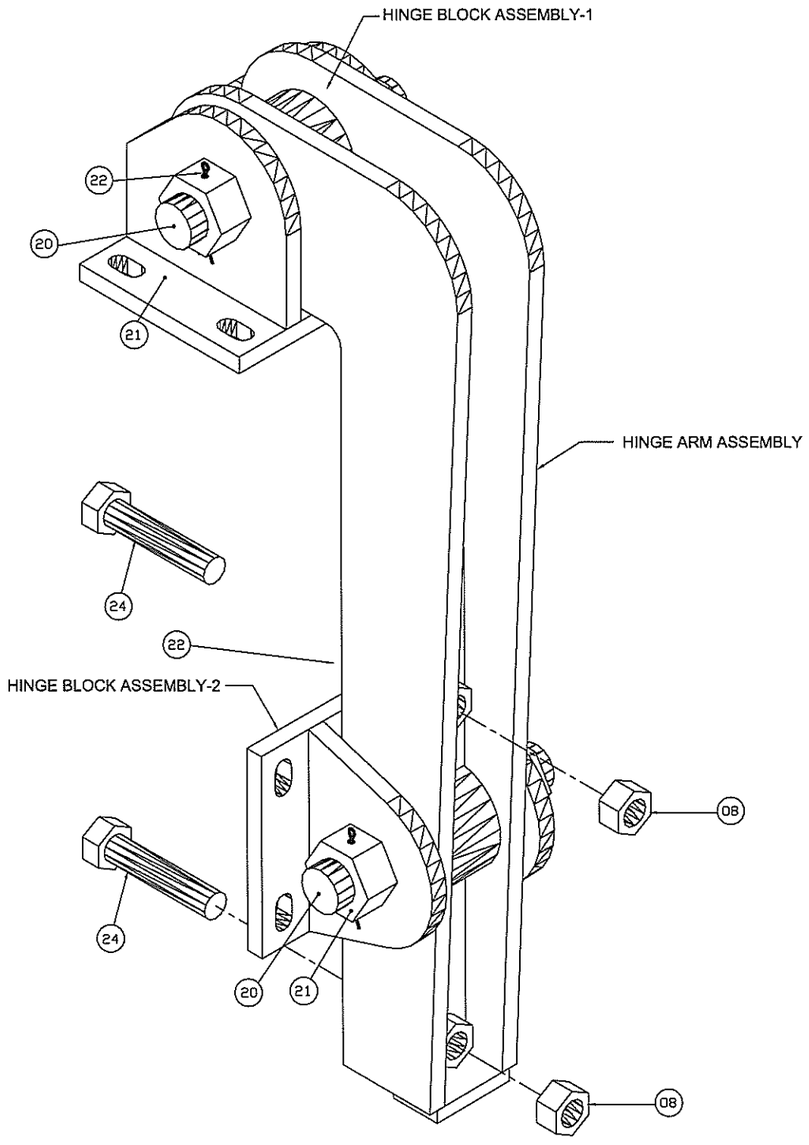
ALT	CHANGE	BY	CKD	DATE

ALT	CHANGE	BY	CKD	DATE

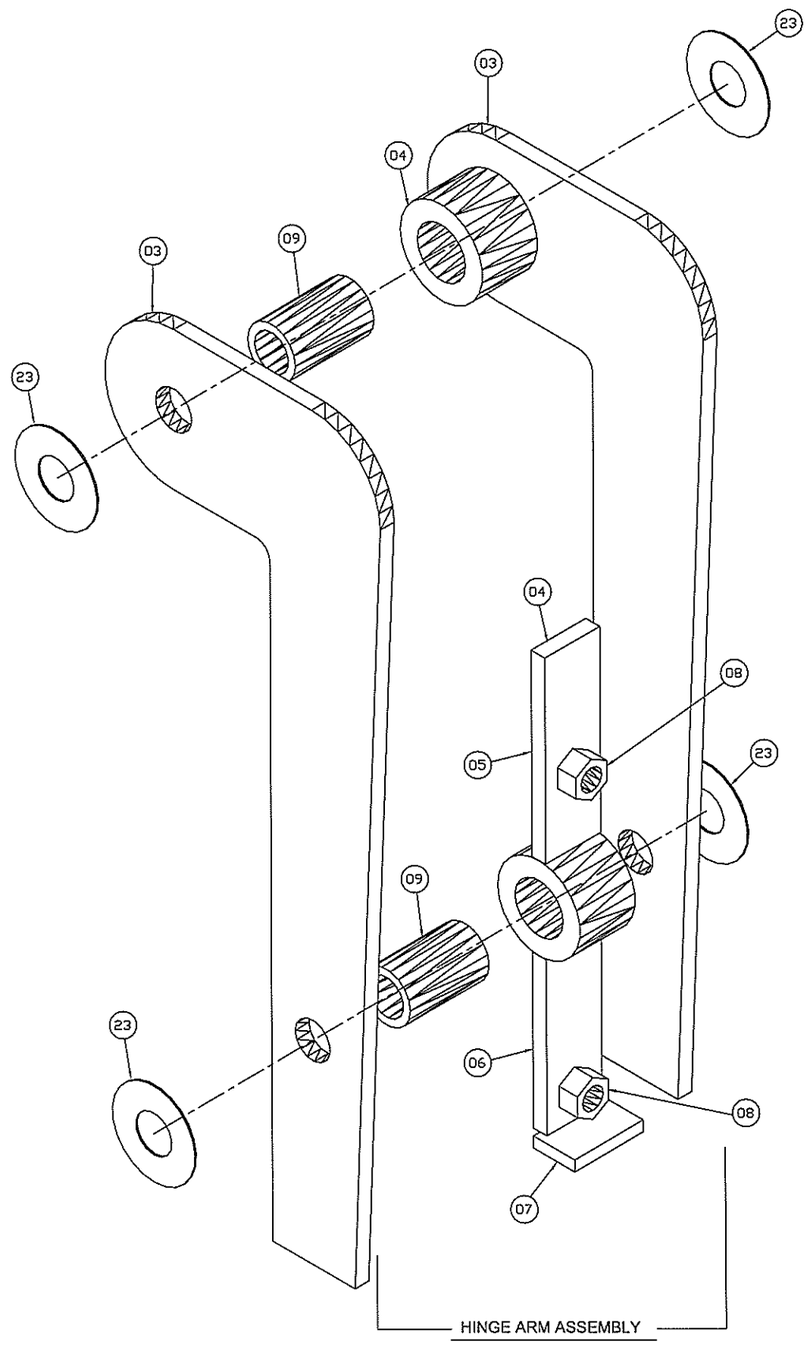
RODNEY HUNT COMPANY ORANGE, MA. 01364-1251

SUB-ASS'Y: S.S. COVER FOR FABRICATED
FLAP VALVE (48.00 X 48.00 OPENING)
FOR: INDEPENDANT ENTERPR1SES, ITEM #1

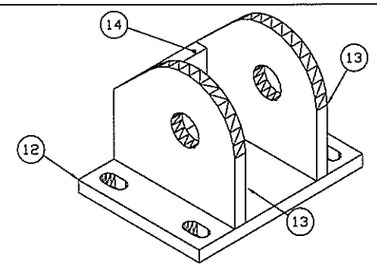
DRAWN SEP	DESIGNED JLD	DATE 2/11/15	
CHECKED CHV	APPROVED	SCALE N.T.S.	
INDEX SYMBOL	ORDER NO. 5140665-3	DWG. NO. E-80932	



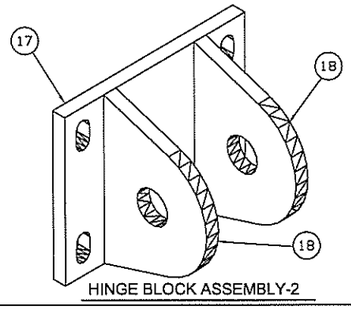
HINGE ASSEMBLY



HINGE ARM ASSEMBLY



HINGE BLOCK ASSEMBLY-1



HINGE BLOCK ASSEMBLY-2

	HINGE ARM ASSEMBLY			
03	PLATE: 0.50 X 10.00 X 26.81 LG. CUT PER DETAIL	S. S.	2	REQ'D
04	BAR ROUND: 3.00 DIA. X 2.00" LG.	S. S.	2	REQ'D
05	BAR: 0.50 X 2.00 X 5.50" LG.	S. S.	1	REQ'D
06	BAR: 0.50 X 2.00 X 5.50" LG.	S. S.	1	REQ'D
07	BAR: 0.37 X 1.50 X 2.50 LG.	S. S.	1	REQ'D
08	HEX NUT: 0.75 UNC	S. S.	4	REQ'D
09	BUSHING: 1.75" O.D. X 1.262" / 1.264 I.D. X 2.87" LG.	BRONZE ASTM ALLOY 865	2	REQ'D
	HINGE BLOCK ASSEMBLY -1			
12	PLATE: 0.50 X 5.50 X 7.50	S. S.	1	REQ'D
13	PLATE: 0.50 X 5.50 X 5.00 LG. CUT PER DETAIL	S. S.	2	REQ'D
14	PLATE: 0.50 X 3.25 X 2.75" LG.	S. S.	1	REQ'D
	HINGE BLOCK ASSEMBLY-2			
17	PLATE: 0.50 X 6.00 X 7.50" LG.	S. S.	1	REQ'D
18	PLATE: 0.50 X 4.25 X 6.00" LG. CUT PER DETAIL	S. S.	2	REQ'D
	SCRS NUTS WASHERS FOR ASSEMBLY			
20	BAR ROUND: 1.245" / 1.250 DIA. X 7.50" LG. PROCESS PER DETAIL	S. S.	2	REQ'D
21	HEX NUT: 1.25 UNC	S. S.	4	REQ'D
22	COTTER PIN: 0.12 X 2.00" LG.	S. S.	4	REQ'D
23	WASHER: 3.00" O.D. X 1.31" I.D. X 0.06" THICK	UHMWP	4	REQ'D
24	H.H.C.S. 0.75 X 4.00" LG.	S. S.	2	REQ'D

TOLERANCE UNLESS OTHERWISE SPECIFIED			
DEC. DIM.	MACHINE	CAST	FABRICATE
1 PLACE	±0.060	±0.250	±0.250
2 PLACE	±0.030	±0.125	±0.125
3 PLACE	±0.015	±0.060	±0.060
ANGLE	±1°0'	±2°0'	±2°0'

ALT	CHANGE	BY	CKD	DATE
1	CHANGED BUSHING MATERIAL FROM LUBRON AQ100	JCV		8.25.11

ALT	CHANGE	BY	CKD	DATE

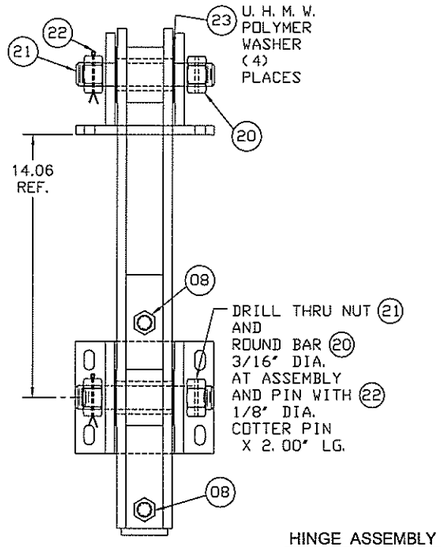
RODNEY HUNT COMPANY ORANGE, MA. 01364-1251

ASSEMBLY: HINGE FOR FABRICATED
48" X 48" FLAP VALVE, ITEM #1
FOR: INDEPENDANT ENTERPRISES

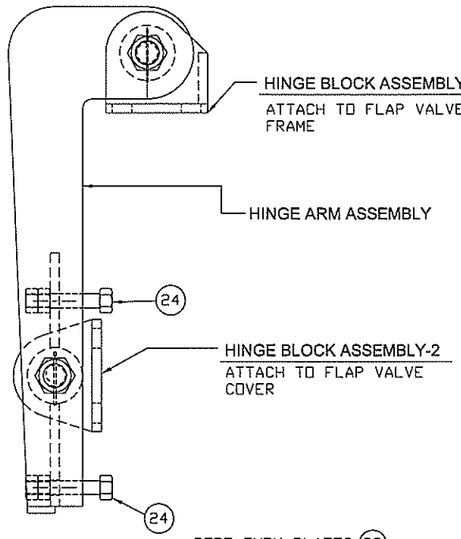
DRAWN SEP	DESIGNED JLD	DATE 2/16/15	
CHECKED CJW	APPROVED	SCALE N.T.S.	
INDEX SYMBOL	ORDER NO. 5140665-3	DWG. NO. E-80935	

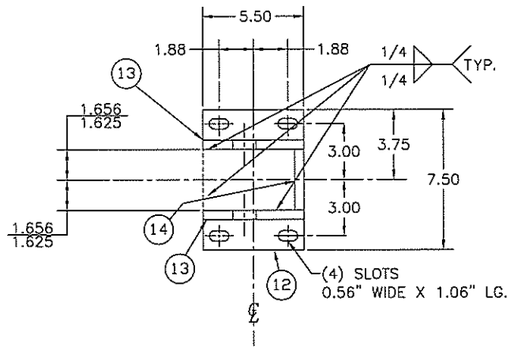
FROM: E-74949

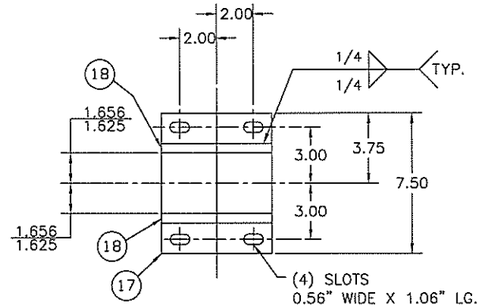
SHEET 1 OF 2

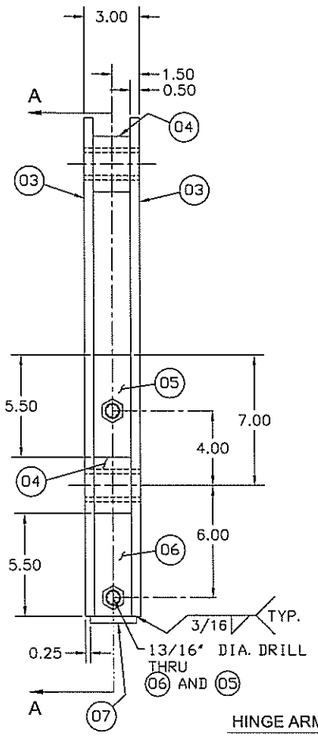


HINGE ASSEMBLY

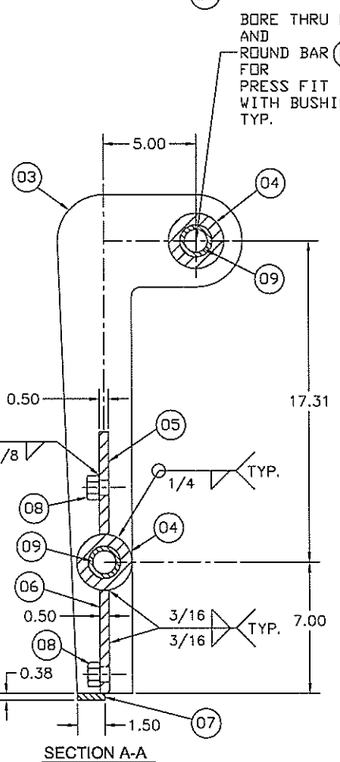




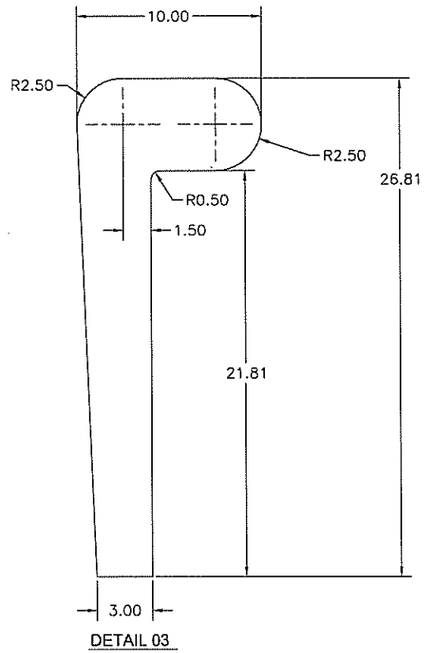




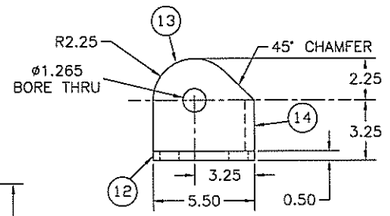
HINGE ARM ASSEMBLY



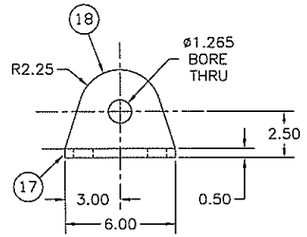
SECTION A-A



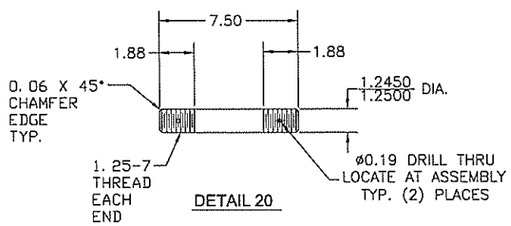
DETAIL 03



HINGE BLOCK ASSEMBLY-1



HINGE BLOCK ASSEMBLY-2



DETAIL 20

TOLERANCE UNLESS OTHERWISE SPECIFIED				ALT	CHANGE	BY	CKD	DATE	ALT	CHANGE	BY	CKD	DATE
DEC. DIM.	MACHINE	CAST	FABRICATE										
1 PLACE	±0.060	±0.250	±0.250										
2 PLACE	±0.030	±0.125	±0.125										
3 PLACE	±0.015	±0.060	±0.060										
ANGLE	±1°0'	±2'0'	±2'0'										

RODNEY HUNT COMPANY ORANGE, MA. 01364-1251

ASSEMBLY: HINGE FOR FABRICATED
48" X 48" FLAP VALVE, ITEM #1
FOR: INDEPENDANT ENTERPRISES

DRAWN	SEP	DESIGNED	JLD	DATE	2/16/15
CHECKED	CHV	APPROVED		SCALE	N.T.S.
INDEX SYMBOL		ORDER NO.	5140665-3	DWG. NO.	E-80935

FROM: E-74949