

**Project: South Battery Park City Resiliency Project:  
Pier A Plaza / Battery Site Work And Near  
Surface Isolation (“NSI”) Construction Services  
Request for Proposals (“RFP”)**

**Date: February 2, 2023**

**RE: Addendum #7  
# of Pages: 85**

---

**A) REVISIONS TO RFP:**

1) The following new or revised/updated Pier A/Battery and NSI Project (the “Project”) drawings and specifications are hereby formally incorporated into the RFP’s *Exhibit B-1 – Construction Documents (Drawings and Specifications)*. These revised/updated drawings and specifications replace and supersede all prior versions issued with the RFP. The revised Specifications content, compared to the content included in the version of the Specification of the RFP’s *Exhibit B-1 – Construction Documents (Project Drawings and Specifications)*, is yellow-highlighted in the enclosed attachments.

- **Revised Landscape Drawings – Attachment #1:** Note that the changes to the below-listed drawings are indicated via a “bubble” that circles the area of the drawings that is revised.

*L301A: Pier A Plaza Rail Plan*  
*L305: Pier A Inlet Materials/Paving Plan*  
*L347: Elevations – Pier A Inlet Veneer*  
*L349: Elevations – Pier A Platform Veneer*  
*L601: Rector Street Materials Plan*

*L900: Details – Paving and Curbs*  
*L932: Details - Handrails, Sea Rail, and Poles*  
*L936: Details – Pier A Bulk Head Guardrail*  
*L945: Details – Pier A Inlet*  
*L962: Details – Battery Paving*

- ***Revised Structural Drawing SS405: Site Structure Sections - Battery – Attachment #2***
- ***Revised Specification Table of Contents – Attachment #3***
- ***Revised Specification 044300.4: Landscape Stone Masonry – Attachment #4***
- ***Revised Specification 055301: Metal Gratings for Pier A Inlet Walkway – Attachment #5***
- ***Revised Specification 099800: Stainless Steel Protective Treatment – Attachment #6***
- ***Revised Specification 313223: Jet Grouting – Attachment #7***
- ***New Specification: Con Edison Requirements for Gas and Utility Work – Attachment #8***

**B) BPCA’S RESPONSE TO SUBSTANTIVE QUESTIONS:**

The following responses (the “Responses”) are provided to the remaining questions (“Questions”) received by Battery Park City Authority (“BPCA”) by 5:00 p.m. Eastern Standard Time on January 19, 2023, in connection with its RFP for the South Battery Park City Resiliency Pier A Plaza / Battery Site Work and Near Surface Isolation (NSI) Project (the “Project”). Note that responses to the first sixty (60) questions received by BPCA on/before January 19, 2023, were provided via the prior Addendum #6. The Responses are provided in bold, italicized print immediately following the Questions. Please note that all capitalized terms shall have the same definitions as provided in the RFP.

- 1) Referring to Specification section 313223 - Jet Grouting and Permeation Grouting, Paragraph 2.01A, Type II Portland Cement is the only cement listed within the jet grout slurry material list. From talking to cement suppliers in the New York Market, Type II cement is being phased out and replaced with type IL. Please confirm that type IL is approved for jet grouting scope of work.  
***Confirmed – Type IL cements are acceptable.***

*[NO FURTHER TEXT ON THIS PAGE]*

- 2) Specification section 313223 - Jet Grouting and Permeation Grouting, Paragraph 2.01C.1 provides a table for required grout/soil mix unit weights and strengths. The listed unit weights and strengths are not achievable via permeation grouting. Please confirm that the unit weight and Strength table provided herein refers only to the soilcrete resulting from the Jet Grouting process and not from the Permeation Grouting process.

***Confirmed; the table provided refers only to the soilcrete resulting from the jet grouting process. Please refer to the response to Question #43 included in the prior Addendum #6 for information related to permeation grout compressive strength.***

- 3) Specification section 313223 - Jet Grouting and Permeation Grouting, Paragraph 3.01D.2 and drawing sheet SF004 specify a maximum allowable grouting pressure for permeation grouting of 2 PSI. Please confirm that this is the effective pressure per foot of overburden.

***2 PSI is the maximum pressure above the existing lateral pressure of the soil to avoid damage to the Brooklyn-Battery Tunnel.***

- 4) Specification section 313223 - Jet Grouting and Permeation Grouting, Paragraph 3.04C describes a maximum spacing of 0.5 x jet grout diameter plus acceptable tolerances for both jet grout and permeation grout column spacing. This contradicts detail D on sheet SF604 depicting 3' diameter columns on 2' spacings with the verticality tolerances described within the specification and is not constructible. Please confirm that the detail D on sheet SF604 governs, or provide provisions to allow for a spacing to be proposed by the contractor based on similar job experience and accepted by the engineer.

***The purpose of the jet and permeation grouting is to prevent seepage under the floodwall. The critical performance criteria is the maximum hydraulic conductivity specified on the Drawings. The selected Proposer may propose alternate grout column spacing as long as the hydraulic conductivity criteria is met and verified through the test program and in-situ testing required by the Specifications. The Specifications have been revised to defer to the 2-foot spacing shown on the Drawings. As noted in Section A – REVISIONS TO RFP (above), a revised version of Specification Section 313223 is provided as Attachment #7. Please refer to the new Specification Section 313224: Permeation Grouting provided in response to Question #59 in the prior Addendum #6.***

- 5) Specification section 313223 - Jet Grouting and Permeation Grouting, Paragraph 3.05C requires the rod lift rate and rod RPM to be automatically set and recorded which typically applies to jet grouting. Lift and rotation are not parameters associated with permeation grouting. Please provide a separate permeation grouting specification.

***As indicated in the response to Question #4 (above), a new Specification Section 313224: Permeation Grouting was provided as part of the prior Addendum #6.***

- 6) Specification section 313223 - Jet Grouting and Permeation Grouting, Paragraph 3.05G.1.a states that "an additional wet grab sampling test suite" may be required at the direction of BPCA's QA representative. Please confirm that this additional test suite consists of the one in-situ sampling round described earlier in the same section.

***The sentence has been revised to read "Obtain up to one additional wet grab sampling round per day at the direction of BPCA's QA Representative, if required. As noted in Section A – REVISIONS TO RFP (above) and stated in the response to Question #4 (above), a revised version of Specification Section 313223 is provided as Attachment #7.***

[NO FURTHER TEXT ON THIS PAGE]

- 7) Specification section 313223 - Jet Grouting and Permeation Grouting, Paragraph 3.05G.1.b requires the use of 6 inch by 12 inch test cylinders. Please revise to allow 3 inch by 6 inch test cylinders, which are typically used for testing jet grouted soilcrete per industry standards.  
***Alternate cylinder sizes are acceptable, but must comply with the requirements of AASHTO T 208 - Standard Method of Test for Unconfined Compressive Strength of Cohesive Soil.***
- 8) Specification section 313223 - Jet Grouting and Permeation Grouting, Paragraph 3.04H.1 requires a minimum RQD of 50%. RQD is not a measurement generally associated with ground improvement as the coring process and the presence of non-native in-situ material can lead to formation of fractures.  
***Testing on the jet grout columns must be performed in accordance with the Specifications.***
- 9) Drawing SS604, Security Bollard Details, indicate Rebar by Bollard Manufacturer, Specifications Section 347113.10 – Fixed and Operable Bollards do not specify any Approved Equal Manufacturers. Could you please provide us with the name of a couple of manufacturers acceptable to the BPCA for us to contact?  
***Please refer to the revised version of Specification 347113.1 provided in response to Question #16 included with the prior Addendum #6. The basis of design is Delta Scientific DSC720. However, following Contract award, the selected Proposer may submit, for review by the Engineer, an alternate system that meets the performance criteria.***
- 10) Sheet L-932.00 is included twice with slight differences in the Contract Drawings. Please clarify which one supersedes the other.  
***Drawing L932 was included twice in error. The correct version of Drawing L932 includes cane bolts on Detail 2/L932 and Detail 4/L932. As noted in Section A – REVISIONS TO RFP (above), both versions of Drawing L932 are provided as Attachment #1. Please note the duplicate page not to be used is crossed out and labeled PAGE NOT IN USE.***
- 11) As noted in the file "12-2022\_SBPCR Package 4\_Compiled Specs", Section 055241 is referenced on pages 500, 600, and 686, but there is no separate section for it. Please advise.  
***Reference to Specification 055241 has been corrected to Specification 055214.4. As noted in Section A – REVISIONS TO RFP (above), revised versions of Specification Sections 044300.4, 055301, and 099800, along with the Specification Table of Contents, are provided in Attachments #3, 4, 5, and 6, respectively.***
- 12) On Sheet C-224.00 there is a call out for Medium Duty Vehicular Pavement (Det. 4 Sht C-811), then on Sheet C-225.00 the match line area calls out Bike Path Asphalt for the same detail. The detail is for Bike Path Asphalt. Is the call out on C-224.00 for Medium Duty Pavement wrong or the detail number?  
***Labels and pavement section hatches have been updated. Please refer to the updated versions of Drawings C-224 and C-225 provided as part of the prior Addendum #6, for additional clarification of bike path asphalt pavement section and light duty vehicular pavement section limits.***
- 13) On Sheet L-305.00, the symbol for a double door is shown with the following detail callout: “2/L932 DOUBLE GATE IN SEARAIL TYP. OF (2) PROVIDE LOCKING MECHANISM AS REQUIRED”. However, on Sheet L-932.00 detail 2 is for “SINGLE GATE IN PIER INLET GUARDRAIL”. On Sheet L-305A.00 the same double doors are called out with a different detail callout: “4/L932 DOUBLE GATE IN PIER A INLET PLATFORM GUARDRAIL, TYP OF (2)”. Please clarify which detail should be used.  
***The callout detail number on Drawing L305 has been corrected to "4/L-932 DOUBLE GATE PROVIDE LOCKING MECHANISM AS REQUIRED". As noted in Section A – REVISIONS TO RFP (above), a revised version of Drawing L305 is provided as part of Attachment #1.***

- 14) Sheet L-347.00 shows the detail callout “7/L-932 SINGLE GATE IN PIER A INLET GUARDRAIL”, but Sheet L-932 shows only detail 4 and 2 so therefore detail 7/L-932 appears to not exist. Please clarify which detail should be referenced on Sheet L-347.00.  
***The callout detail number on Drawing L347 has been corrected to "2/L932 for SINGLE GATE IN PIER A INLET GUARDRAIL". As noted in Section A – REVISIONS TO RFP (above), a revised version of Drawing L347 is provided as part of Attachment #1.***
- 15) Sheet L-347.00 calls out detail “3/L-935 “PLAZA AREA GUARDRAIL” but on Sheet L-935.00 detail 3/L-935 is titled “PIER A INLET GUARDRAIL”. The detail for Plaza Area Guardrail is shown on Sheet L-937.00 under detail 2/L-937. These details are different so please clarify which should be referenced on Sheet L-347.00.  
***The callout title for Detail 3/L935 on Drawing L347 has been corrected to "PIER A INLET GUARDRAIL". As noted in Section A – REVISIONS TO RFP (above) and in the response to Question #14, a revised version of Drawing L347 is provided as part of Attachment #1.***
- 16) Sheet L-349.00 shows a detail callout for detail “3/L935 PIER A INLET GUARDRAIL” pointing to a symbol for the guardrail with a handrail, but the detail on Sheet L-935.00 does not show a handrail. Please clarify if the Pier A inlet guardrail has a handrail.  
***The Pier A inlet guardrail does not have a handrail. The handrail linework has been removed from Drawing L349. As noted in Section A – REVISIONS TO RFP (above), a revised version of Drawing L349 is provided as part of Attachment #1.***
- 17) Reference Sheet L-301A.00: The 51’ LF Guardrail labeled as INLET AREA GUARDRAIL in the legend notes is called out as PLAZA AREA GUARDRAIL and refers to details: 2/L937 PLAZA AREA GUARDRAIL and All/L936. Please confirm if this 51’ LF guardrail is identified as the inlet area guardrail or the plaza area guardrail? Additionally, please clarify what specific detail and drawing we should refer to?  
***The guardrail labeled as 2/L937 PLAZA AREA GUARDRAIL and ALL/L936 has been corrected to 1/L936 POST LAYOUT AT INLET AREA GUARDRAIL - ELEVATION. Additional callouts labeled as 3/L935 PIER A INLET GUARDRAIL and 2/L936 INLET AREA GUARDRAIL TYPICAL HANDRAIL AT STAIRS - ELEVATION will be added to Detail 1/L936 to better differentiate multiple detail interfaces. As noted in Section A – REVISIONS TO RFP (above), revised versions of Drawings L301A and L936 are both provided a part of Attachment #1.***
- 18) We formally request a four (4) week bid extension from February 16th to March 16th.  
***See response to Question #12 in the prior Addendum #6.***
- 19) Lutron Control System one line diagram was shown in the specification. Does furnishing and installing Lutron Control System included in Package 4 scope? If not, what exact scope of work that needs to be done for the Lutron control system in Package 4?  
***It is one lighting control system for all South Battery Park City Resiliency Project (“SBPCR Project”) construction packages. The related control components are included in Package 4. Please refer to Drawing G008 for package demarcations.***
- 20) Refer to Lighting Control Schedule 2022-10-20 Conformed Set in the specification. Please highlight the type of fixtures and quantities that need to be furnished and installed in Package 4. Quantities in Drawings G-008, SE204, LC04 do not coincide with each other.  
***Please refer to the zone numbers that are included on the Lighting Drawings. Also, please see Questions #23 and 25 responses provided in the prior Addendum #6.***



- 21) There are cameras, WIFI access point and speaker in TB Poles shown in Drawing LC09. Conduit runs for these were not shown in the drawings. Will these be wireless connected to the Base station? If not, please provide a conduit run and/or one-line-diagram for communication system.  
***Please see response to Question #29 provided in the prior Addendum #6.***
- 22) Drawing UGT104 shows Electrical Utility works. Please provide specification section for this scope of work.  
***As noted in Section A – REVISIONS TO RFP (above), a new specification for the Con Edison utility work is provided hereto as Attachment #8.***
- 23) Drawing L-945.00 has some overlapping text and is not clear. Please reissue a clean copy.  
***As indicated in Section A – REVISIONS TO RFP (above), a clean PDF copy of Drawing L945 is provided as part of Attachment #1.***
- 24) Please refer the area labeled "CONC PLTR TUB TYP. SEE NOTE 3" on Drawing C-224. This points to details on drawing C-812, which indicates a concrete slab at the bottom of this planter tub. It also states to see structural drawings for details of this slab, however the structural drawings do not show this bottom slab at all. Please provide details and extents of this concrete bottom slab at the planter tub.  
***A detail has been added to Structural Drawing SS405. As noted in Section A – REVISIONS TO RFP (above), a revised version of Drawing SS405 is provided as Attachment #2.***
- 25) Refer to Specs section 275131:2.01A, Site Fire Alarm post, subbase and hardware shall be purchased by contractor at no additional cost to BPCA. Please provide quantities, locations and a One-Line-diagram for conduit runs.  
***Please refer to Drawing EGT103 which shows the existing fire alarm box and post. A new fire alarm post and associated conduit are not required, as the pole has recently been replaced with a solar-powered unit. The existing fire alarm post is to be protected in place. Any work that may require removal of the fire alarm post during construction must be coordinated with FDNY.***
- 26) Refer to Drawing LC09, TB Pole Elevation; there are batteries inside the Manhole. Please provide details and specs for these.  
***Please coordinate with the pole manufacturer (HEI) or approved equal to obtain this information during the Pier A/Battery and NSI Project's shop drawing phase.***
- 27) Drawings L-601 indicates hatched area as "Salvage Stone Pavement" and refers to detail 9/L962, however detail 9/L962 "Salvaged Stone Flush Pavement" is crossed out indicating "NIC". Please advise as to the Stone TYPE, Quarry, Thickness to replace existing damaged or new configured and required stone at Rector Park to allow for new CSO Chamber Manholes and construction.  
***Field conditions related to the existing granite stone pavers at Rector Street have not been verified. The thickness of granite pavers should be verified in the field by the selected Proposer. The callout 9/L962 SALVAGE STONE PAVEMENT REPLACE IN KIND, MATCH ADJACENT PIECES, PATTERN AND FINISH on Drawing L601 has been revised to 7/L900 SITE SALVAGE GRANITE PAVING, REPLACE IN KIND, MATCH JOINING ADJACENT PIECES, PATTERN AND FINISH. A new detail for Site Salvage Granite Paving will be added to Drawing L900 as Detail 7/L-900. As noted in Section A – REVISIONS TO RFP (above), revised versions of Drawings L601 and L900 are both provided as part of Attachment #1.***
- 28) Exhibit C-2 (Form of Bid Breakdown) contains Item No. 10.0: Division 23 – Heating, Venting and Air Conditioning. Please advise if this item is part of the scope of work for this contract? If so, please provide missing Division 23 specifications.  
***See response to Question #8 in the prior Addendum #6.***

- 29) Provide information for the Warranties and Maintenance Period for this contract.  
***Please see Article 20 of the RFP's Exhibit H - Standard Form of Contract for the selected Proposer's warranty obligations. Specific warranty and guarantee periods for the materials or work provided under the Contract (such as manufacturers' warranties) are set forth in the relevant portions of the Specifications.***
- 30) Is there any retainage or retainage percentage under this contract?  
***Yes. Please see, e.g., Article 5.1 of Exhibit H- Standard Form of Contract, along with other provisions referencing retainage.***
- 31) We are assuming this is a Tax-Exempt project. Please confirm.  
***BPCA is exempt from payment of sales and compensating use taxes of the State of New York and of cities and counties thereof on all materials that will become an integral component of the completed SBPCR Project.***
- 32) Please confirm no Temporary Field Office for the Owner or any supplies are required under this Contract?  
***The relevant requirements are as documented in Specification 015000: Temporary Facilities, Services, and Controls.***
- 33) How many total Photos are required for this contract?  
***Requirements for photographs are provided in the Specifications. A total amount of photographs will not be provided.***
- 34) Exhibit F New York State Diversity Forms requires the proposer to submit a completed MWBE Utilization Plan (Exhibit F-2) with its Proposal. Given that it is difficult to finalize the MWBE subcontracts prior to the Proposal submission, will BPCA permit the Proposer to insert to be determined ("TBD") instead of the MWBE subcontractor's name? ***Yes.***
- 35) Exhibit F New York State Diversity Forms requires the proposer to submit a completed SDVOB Utilization Plan (Exhibit F-3) with its Proposal. Given that it is difficult to finalize the SDVOB subcontracts prior to the Proposal submission, will BPCA permit the Proposer to insert to be determined ("TBD") instead of the SDVOB subcontractor's name? ***Yes.***
- 36) Specification 3471113.1 Fixed and Operable Bollard are referenced in this document and contract drawings. Please provide acceptable Manufacturer(s) for this scope. Specially for Operable Bollards which includes mechanical and electrical components not shown in contract drawings and referenced specifications.  
***See response to Question #16 in the prior Addendum #6.***
- 37) Specification 015000, paragraph 3.14 Security Guards. Please acknowledge (1) Security Guard is required when the Contractor is not present on the work site?  
***Confirmed.***
- 38) Specification 015000, paragraph 3.11 Rodent and Insect Control. Please advise how many site visits per month a Rodent/Insect Control representative will be required to maintain the project site?  
***See response to Question #32, above.***
- 39) This project requires Site Utility work as well as Roadway Resurfacing along city streets, specifically West Highway Rt. 9A which is also governing by NYCDOT. Provide Traffic Stipulations for the reference section of the work (Route 9A) as the Provided OCMC stipulations (Supporting Documents) fail to identify traffic stipulations for this area.  
***Any traffic lane closures required for work on Route 9A must be done during overnight hours.***
- 40) Exhibit D, Section 4-3 List of Key Personnel lists 4-3.1 Project Executive as part of the key team members for this project. Please advise if this member will be required as a Full-Time representative for this project?  
***See response to Question #5 in the prior Addendum #6.***

- 41) Exhibit D, Section 4-3 List of Key Personnel lists 4-3.4 Project Scheduler as part of the key team members for this project. Please advise if this member will be required as a Full-Time representative for this project?  
***See response to Question #6 in the prior Addendum #6.***
- 42) Exhibit D, Section 4-3 List of Key Personnel lists 4-3.5 Project Estimator as part of the key team members for this project. Please advise if this member will be required as a Full-Time representative for this project?  
***See response to Question #7 in the prior Addendum #6.***
- 43) Exhibit D, Section 4-3 List of Key Personnel lists 4-3.6 Quality Manager as part of the key team members for this project. Please advise if this member will be required as a Full-Time representative for this project?  
***A full-time Quality Manager is not required.***
- 44) Exhibit D, Section 4-3 List of Key Personnel lists 4-3.7 Sustainability Representative as part of the key team members for this project. Please advise if this member will be required as a Full-Time representative for this project?  
***A full-time Sustainability Representative is not required.***
- 45) Exhibit D, Section 4-3 List of Key Personnel lists 4-3.8 Safety Manager as part of the key team members for this project. Please advise if this member will be required as a Full-Time representative for this project?  
***A full-time safety manager is required, as detailed in Specification 013526 – Safety and Health Requirements.***
- 46) Exhibit D, Section 4-3 List of Key Personnel lists 4-3.10 Additional Personnel as part of the key team members for this project. Please elaborate further how many more additional key personnel & their duties for this project?  
***The selected Proposer may identify/propose additional personnel for performance of the Work that are not specifically identified in the Project requirements.***
- 47) With regards to Specification 055005 Flood Gate Inlaid Panels. Please provide a list of approved manufacturer/fabricator's.  
***Please refer to Specification Section 055005 – Flood Gate Inlaid Panels, Subsection 2.03 – Slip Resistant Surface.***
- 48) For specification 013233: Photographic documentation, please advise how many:  
a. Construction Photograph (Monthly prints)  
b. Periodic Construction Photographs (how many bi-weekly)  
c. Special Photographs  
d. Final Completion Photographs  
***No additional information will be provided other than what is already provided in the referenced Specification.***
- 49) Addendum # 3 extends the date to receive responses from the Owner to our RFI questions. We would like to request an extension of time for the Proposal due date from February 16th to February 23rd; as our vendors and subcontractors will need this time to digest and execute any responded clarifications.  
***See response to Question #12 in the prior Addendum #6.***
- 50) Table of Contents for Division specification 013300 does not match with provided specification 013250: Critical Path Method (CPM) Schedule.  
***As noted in Section A – REVISIONS TO RFP (above) and stated in the response to Question #11 (above), a revised version of Specification Table of Contents is provided as Attachment #3.***

[NO FURTHER TEXT ON THIS PAGE]

- 51) Table of Contents for Division specification 013526 does not match with provided specification 013300: Submittal Procedure.  
*See response to Question #50, above.*
- 52) Table of Contents for Division specification 01400 does not match with provided specification 013526: Safety & Health Requirements.  
*See response to Question #50, above.*
- 53) Specification 014000: Quality Requirements is not listed in specification Table of Contents  
*See response to Question #50, above.*
- 54) Provide a list of Special Inspection since “the Contractor shall be responsible for the cost of any retesting or re-inspection of work which fails....” as described in 04100-3 Special Inspections, paragraph 1.6 C.  
*Please refer to Drawing SF003 for a list of special inspections.*
- 55) Please confirm the Owner will not require any monthly Office Supplies or any office expenses incidentals as part of specification 0150000-Temporary Facilities. If there is any requirement; please provide a list of items.  
*See response to Question #32, above.*
- 56) Specification 015528, Part 3-C., directs contractor to use Traffic Agents as stipulated by OCMC and/or directed by Construction Manager. Provided OCMC stipulations (Supporting Documents) *Please consult the draft Traffic Stipulations which were included in the RFP as part of Exhibit B-2 – Supporting Documents (Informational Purposes). The name of the draft Traffic Stipulations file is: “12-2022\_SBPC Traffic Stipulations.” As noted in General Note 1 of the draft Traffic Stipulations, the selected Proposer is responsible for coordinating and submitting plans with the NYC Department of Transportation’s (“NYCDOT”) Office of Construction Mitigation and Coordination (OCMC) to obtain final Traffic Stipulations and construction permits for this Pier A/Battery and NSI Project.*
- 57) Can you elaborate on Asphalt Block Pavers on Concrete Base set on Bike Path Asphalt sections? The cross sections seem to override each other.  
*For additional clarification of Bike Path Asphalt Pavement Section and Light Duty Vehicular Pavement Section limits, please refer to the updated versions of Drawings C-224 and C-225 provided as part of Question #57 included in the prior Addendum #6.*
- 58) Can you elaborate on Granite Paver Swale on Concrete Base set on Bike Path Asphalt sections? Same as above.  
*Please see response to Question #57, above.*
- 59) Can you elaborate on the Granite Edging (Curb) set adjacent to the Granite Paver Swale on Concrete Base? Does the cradle tie into the concrete base, or is there a space like shown on the detail? What would the space be filled with? Is it a joint material?  
*Call out MORTAR SETTING BED has been added to Detail 8/L962. Setting bed is as indicated on Specification 321499.4, Section 2.16 D. As noted in Section A – REVISIONS TO RFP (above), a revised version of Drawing L962 is provided as part of Attachment #1.*
- 60) Is the Granite Cobble alongside Battery Place where the monument installation but outside the Limit of Work part of Package 4?  
*The granite cobble alongside Battery Place is part of Package 4 and within this Project’s Limit of Work. Please refer to L.O.W. on Drawing L-403: Battery Paving Plan A.*

[NO FURTHER TEXT ON THIS PAGE]

- 61) In Addendum 5 for SBPR Pier A, Battery Work and NSI, it appears that BPC is replacing two drawings from Exhibit B-1 and B-2. Can you provide us with the revised Exhibit B-1 and B-2, or confirm where we can find these updated documents? They were not included as attachments to Addendum 5.

***In accordance with the prior Addendum #5, the final Pier A and Castle Clinton Construction Protection Plans have been added to the Exhibit B-1 Dropbox sub-folder, located within the Exhibits A-I Dropbox link.***

By signing the line below, I am acknowledging that all pages of this Addendum #7 have been received, reviewed and understood, and will be incorporated into the Proposal submitted. This document must be attached to the Proposal for consideration.

---

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

Number of pages received: \_\_\_\_\_ <fill in>

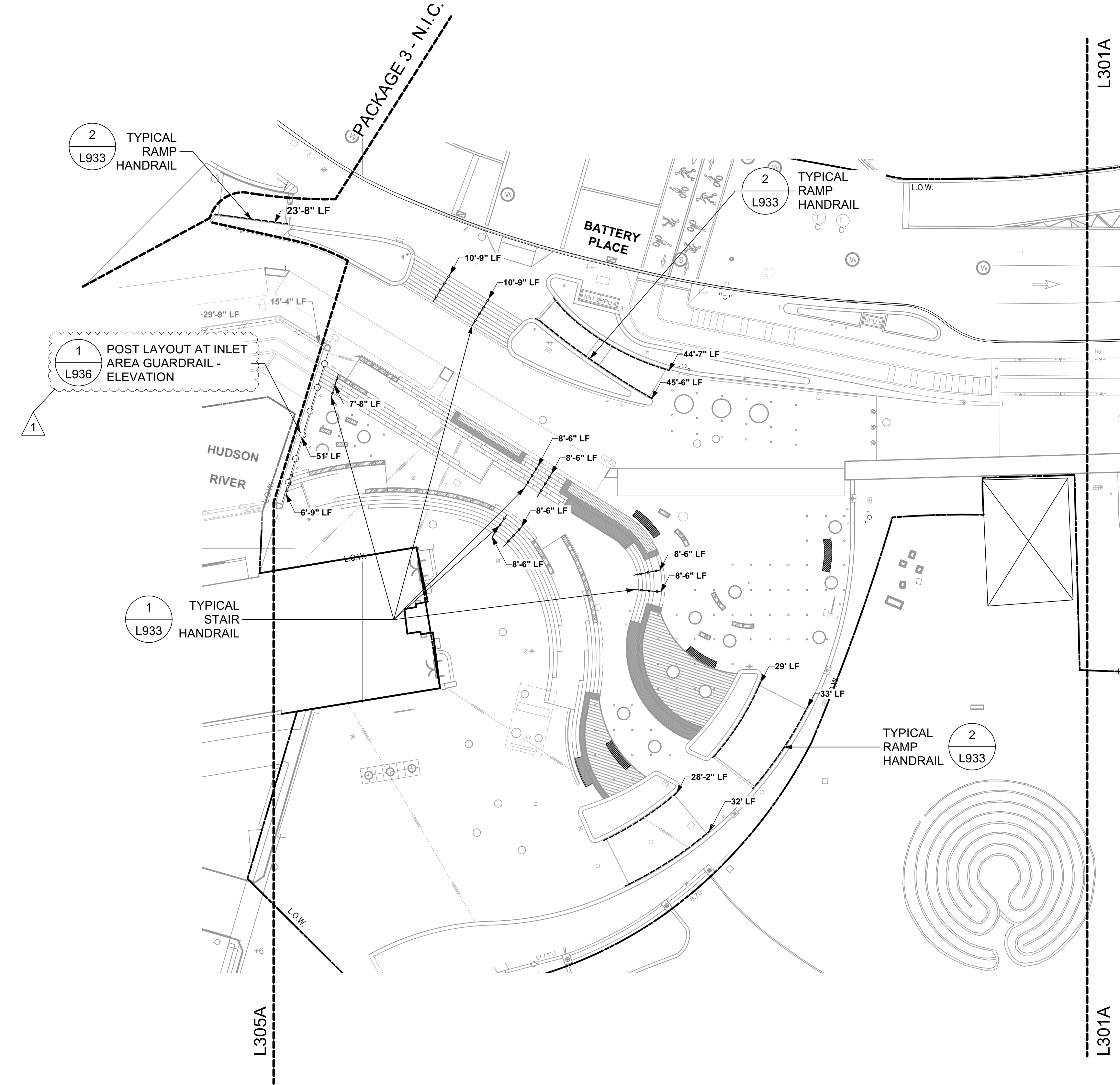
Distributed to: All prospective Proposers

*[NO FURTHER TEXT ON THIS PAGE]*

**ATTACHMENT #1**  
**REVISED LANDSCAPE DRAWINGS**  
*L301A: Pier A Plaza Rail Plan*  
*L305: Pier A Inlet Materials/Paving Plan*  
*L347: Elevations – Pier A Inlet Veneer*  
*L349: Elevations – Pier A Platform Veneer*  
*L601: Rector Street Materials Plan*  
*L900: Details – Paving and Curbs*  
*L932: Details - Handrails, Sea Rail, and Poles*  
*L936: Details – Pier A Bulk Head Guardrail*  
*L945: Details – Pier A Inlet*  
*L962: Details – Battery Paving*

(ATTACHED)

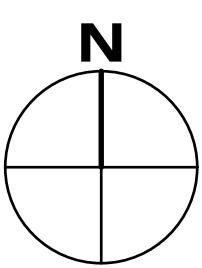




1 PIER A RAIL PLAN  
L-301A.00 SCALE: 1" = 20'-0"

RAIL LEGEND

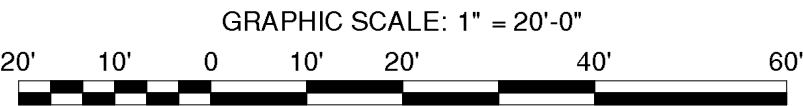
- INLET AREA GUARDRAIL
- TYPICAL STAIR HANDRAIL
- TYPICAL RAMP HANDRAIL



- 2 L933
- 1 L933
- 2 L937

NOTES:

- SEE L001 FOR GENERAL NOTES AND LEGEND.
- SEE CIVIL DRAWINGS FOR DRAINAGE AND GRADING PLANS.
- V.I.F LENGTH OF ALL RAILS. COORDINATE ALL POST LAYOUTS WITH SHOP DRAWINGS AND PROVIDE TO L.A. FOR APPROVAL PRIOR TO INSTALLATION.
- RAILINGS TO COMPLY WITH ALL CODE AND GUIDELINES. PROVIDE SHOP DRAWINGS FOR APPROVAL BY L.A. PRIOR TO INSTALLTION.
- SEE L305 FOR PIER A INLET MATERIALS PLAN.
- SEE PAGE L300 FOR PACAKGE DELINEATION.



PROJECT

SOUTH BATTERY PARK CITY  
RESILIENCY DESIGN  
SERVICES

CLIENT

HUGH L. CAREY  
BATTERY PARK CITY AUTHORITY

CONSULTANT

AECOM

AECOM USA  
605 3rd Ave, 2nd Floor, New York, NY 10158  
212.973.2900 tel www.aecom.com

SUB-CONSULTANT

MAGNUSON KLEMENCIC ASSOCIATES  
1301 Fifth Avenue, Suite 3200, Seattle, WA 98101-2699  
206.292.1200 tel 206.292.1201 fax www.mka.com

SITE WORKS  
150 West 28th St., Suite 605  
New York, NY 10001 212.255.8350 siteworkscm.com

MILHOUSE  
333 South Wabash Ave., Suite 2901,  
Chicago, IL 60604 312.387.0061 milhouseinc.com

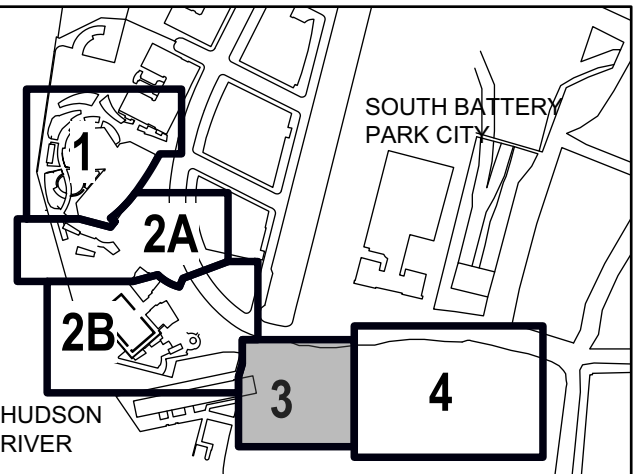
TILLOTSON DESIGN ASSOCIATES  
40 North St., Rm 705, New York, NY 10013  
212.675.7760 tilloftsondesign.com

THOMAS PHIFER AND PARTNERS  
180 Varick St., New York, NY 10014  
212.337.0334 thomaspheifer.com

NAIK CONSULTING GROUP, PC  
111 West 33rd St., Suite 605 New York, NY 10120  
212.576.2701 naikgroup.com

OWEIS  
100 East Hanover Ave., Suite 101, Cedar Knolls, NJ 07927  
973.539.440 oweisengineering.com

KEY PLAN



REGISTRATION



NYC SBS JOB NUMBER

20220059

ISSUE/REVISION

NO.	DATE	DESCRIPTION
1	2023-01-25	ADDENDUM REVISION 1
I	2022-11-11	BID SET
I/R	DATE	DESCRIPTION

PROJECT/TERM CONTRACT NUMBER

Contract No. 18-2586

SHEET TITLE

PIER A PLAZA RAIL PLAN

SHEET NUMBER

L-301A.00

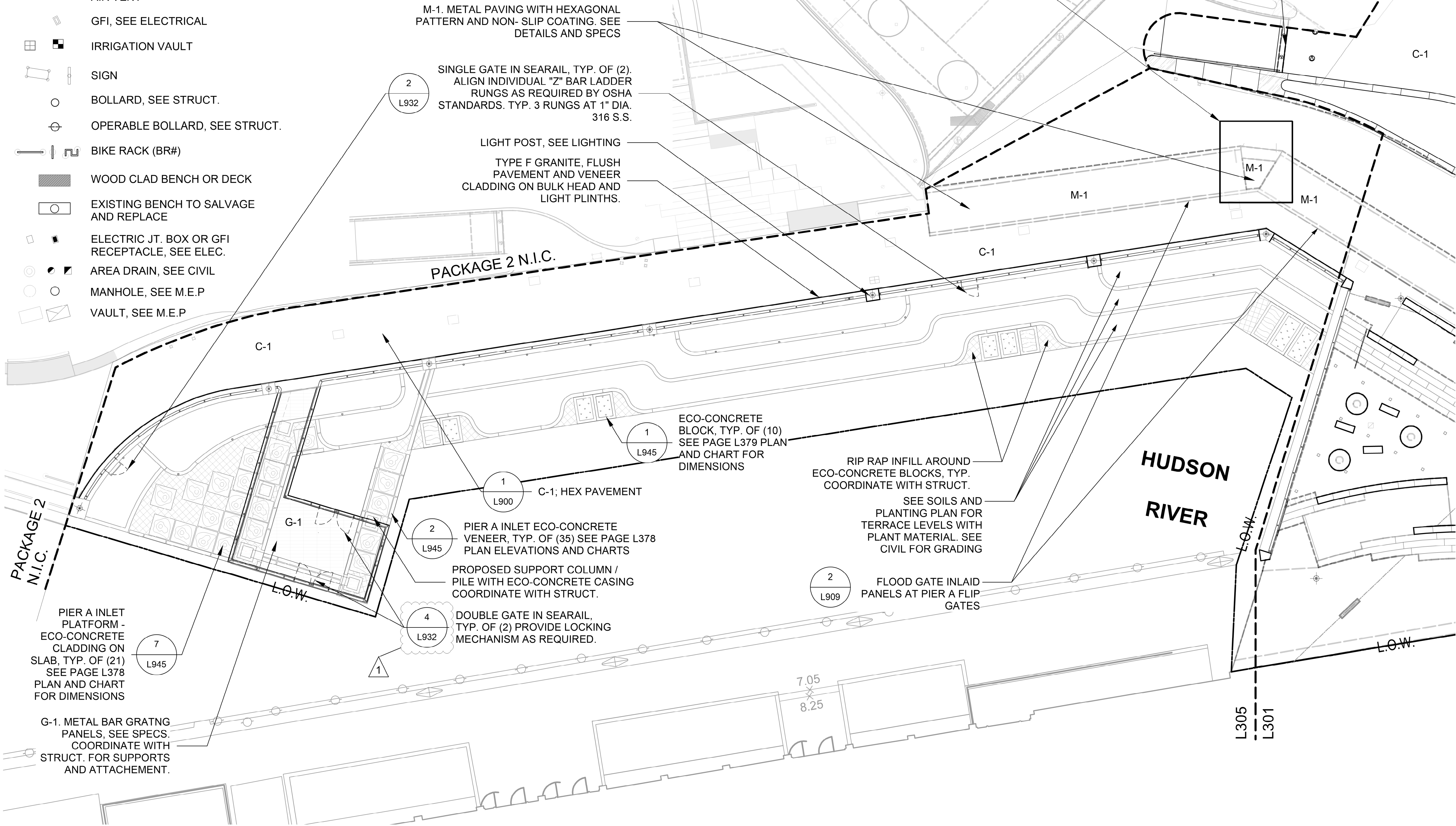


LEGEND

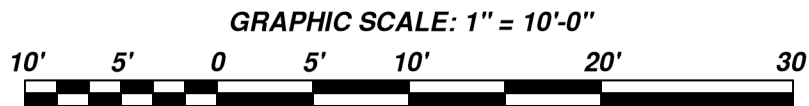
- WALL
- RAILING
- LIGHT POLE, SEE LIGHTING
- SCULPTURE OR MONUMENT
- AIR VENT
- GFI, SEE ELECTRICAL
- IRRIGATION VAULT
- SIGN
- BOLLARD, SEE STRUCT.
- OPERABLE BOLLARD, SEE STRUCT.
- BIKE RACK (BR#)
- WOOD CLAD BENCH OR DECK
- EXISTING BENCH TO SALVAGE AND REPLACE
- ELECTRIC JT. BOX OR GFI RECEPTACLE, SEE ELEC.
- AREA DRAIN, SEE CIVIL
- MANHOLE, SEE M.E.P
- VAULT, SEE M.E.P

PAVING LEGEND

- C-# HEX ASPHALT PAVEMENT
- M-# METAL PANEL INCISED HEXOGANAL PAVEMENT
- G-# METAL BAR GRATING, SEE SPECIFICATION.



1 PIER A INLET MATERIALS PLAN  
SCALE: 1" = 10'-0"



PROJECT

SOUTH BATTERY PARK CITY  
RESILIENCY DESIGN  
SERVICES

CLIENT

HUGH L. CAREY  
BATTERY PARK CITY AUTHORITY

CONSULTANT



AECOM USA  
605 3rd Ave, 2nd Floor, New York, NY 10158  
212.973.2900 tel www.aecom.com

SUB-CONSULTANT

MAGNUSON KLEINOWIC ASSOCIATES  
1301 Fifth Avenue, Suite 3200, Seattle, WA 98101-2699  
206.292.1200 tel 206.292.1201 fax www.mka.com

SITE WORKS  
150 West 28th St, Suite 605  
New York, NY 10001 212.255.8350 siteworks.com

MILHOUSE  
333 South Wabash Ave, Suite 2901  
Chicago, IL 60604 313.987.0061 milhouseinc.com

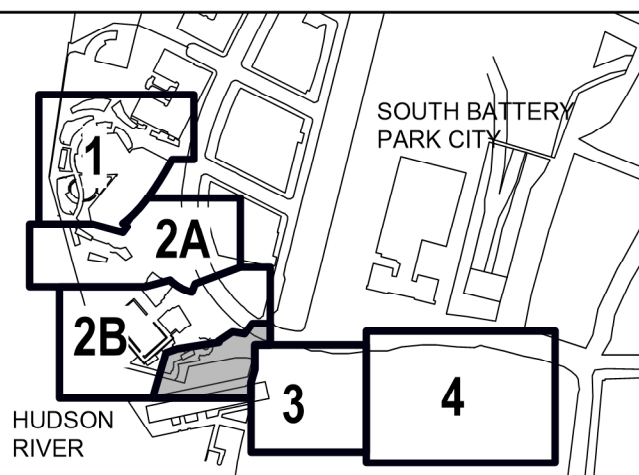
TILLOTSON DESIGN ASSOCIATES  
40 North St, Rm 703, New York, NY 10013  
212.675.7760 tillotsondesign.com

THOMAS PHIFER AND PARTNERS  
180 Varick St, New York, NY 10014  
212.337.0334 thomasphifer.com

NAIK CONSULTING GROUP, PC  
111 West 33rd St, Suite 605 New York, NY 10120  
212.575.2701 naikgroup.com

OWEIS  
100 East Hanover Ave., Suite 101, Cedar Knolls, NJ 07927  
973.539.440 oweisengineering.com

KEY PLAN



REGISTRATION



NYC SBS JOB NUMBER

20220059

ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	2023-01-25	ADDENDUM REVISION 1
I	2022-11-11	BID SET

PROJECT/TERM CONTRACT NUMBER

Contract No. 18-2586

SHEET TITLE

PIER A INLET  
MATERIALS/PAVING PLAN

SHEET NUMBER

L-305.00



LEGEND:

5

L945

TYPE A VENEER SEGMENT  
TYP OF (4)

6

L945

TYPE B VENEER SEGMENT  
TYP. OF (5)

4

L945

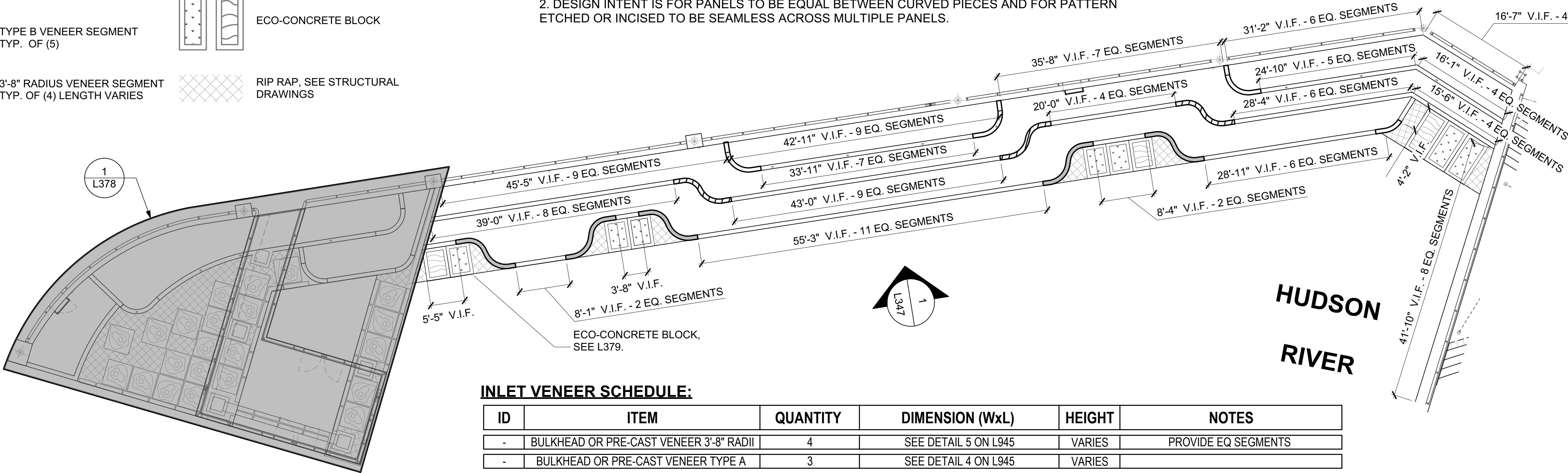
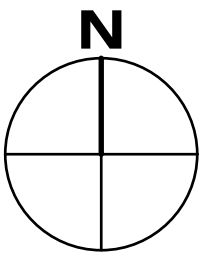
3'-8" RADIUS VENEER SEGMENT  
TYP. OF (4) LENGTH VARIES

ECO-CONCRETE BLOCK

RIP RAP, SEE STRUCTURAL  
DRAWINGS

NOTES:

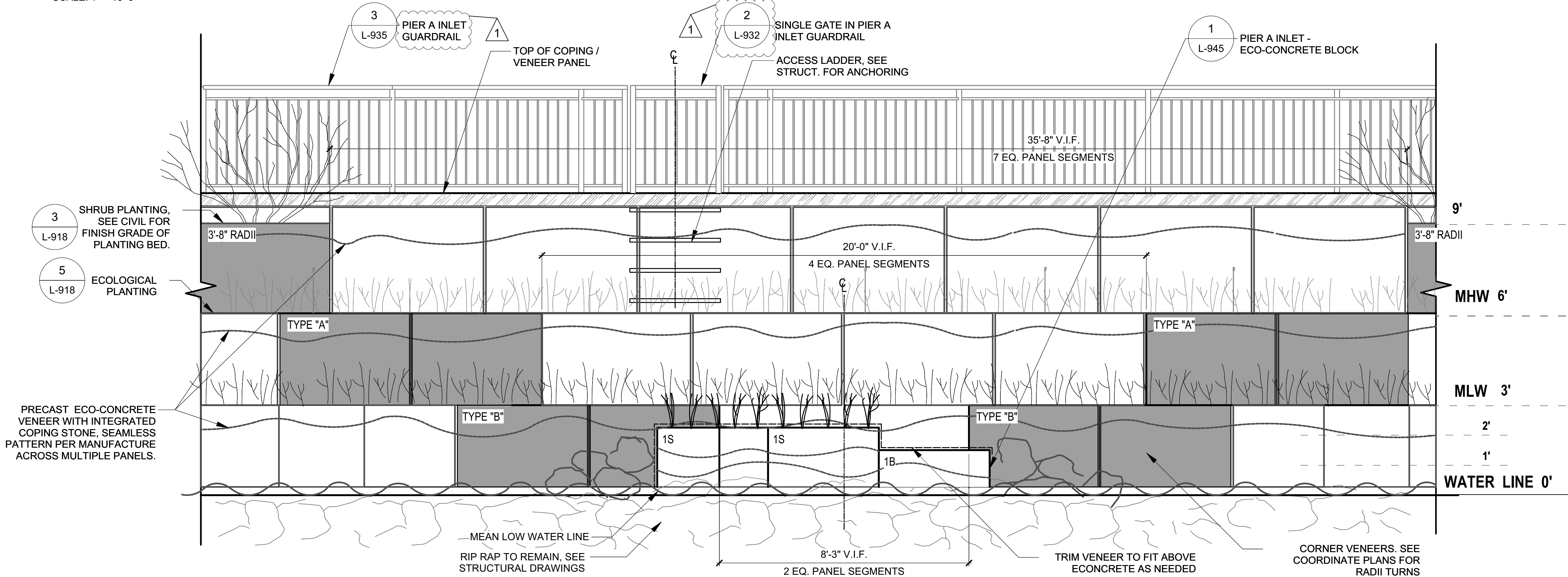
1. SEE LAYOUT PLAN FOR COORDINATES, VARY ALL DIMENSIONS IN FIELD AND WITH SHOP DRAWINGS WITH FABRICATORS AS REQUIRED.
2. DESIGN INTENT IS FOR PANELS TO BE EQUAL BETWEEN CURVED PIECES AND FOR PATTERN ETCHED OR INCISED TO BE SEAMLESS ACROSS MULTIPLE PANELS.



KEY PLAN - PIER A INLET WALLS  
SCALE: 1" = 10'-0"

INLET VENEER SCHEDULE:

ID	ITEM	QUANTITY	DIMENSION (WxL)	HEIGHT	NOTES
-	BULKHEAD OR PRE-CAST VENEER 3'-8" RADII	4	SEE DETAIL 5 ON L945	VARIES	PROVIDE EQ SEGMENTS
-	BULKHEAD OR PRE-CAST VENEER TYPE A	3	SEE DETAIL 4 ON L945	VARIES	
-	BULKHEAD OR PRE-CAST VENEER TYPE B	5	SEE DETAIL 6 ON L945	VARIES	
-	BULKHEAD OR PRE-CAST VENEER	V.I.F	SEE DETAIL 1 ON L945	VARIES	



1 ELEVATION - SOUTH PIER A INLET WALL WITH PLANTING  
SCALE: 1/2" = 1'-0"

PROJECT

SOUTH BATTERY PARK CITY  
RESILIENCY DESIGN  
SERVICES

CLIENT

HUGH L. CAREY  
BATTERY PARK CITY AUTHORITY

CONSULTANT

AECOM

AECOM USA  
605 3rd Ave, 2nd Floor, New York, NY 10158  
212.973.2900 tel www.aecom.com

SUB-CONSULTANT

MAGNUSON KLEMENCIC ASSOCIATES  
1301 Fifth Avenue, Suite 3200, Seattle, WA 98101-2699  
206.292.1200 tel 206.292.1201 fax www.mka.com

SITE WORKS  
150 West 28th St., Suite 605  
New York, NY 10001 212.255.8350 siteworkscm.com

MILHOUSE  
333 South Wabash Ave, Suite 2901,  
Chicago, IL 60604 313.987.0061 milhouseinc.com

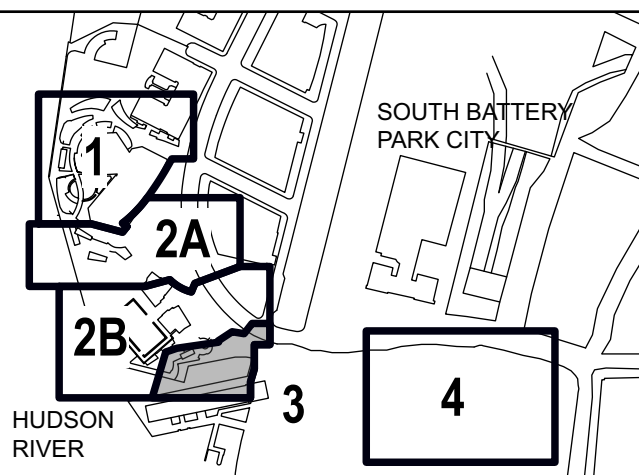
TILLOTSON DESIGN ASSOCIATES  
40 Worth St, Rm 705, New York, NY 10013  
212.675.7760 tilotsondesign.com

THOMAS PHIFER AND PARTNERS  
180 Varick St, New York, NY 10014  
212.337.0334 thomaspifer.com

NAIK CONSULTING GROUP, PC  
111 West 33rd St., Suite 605 New York, NY 10120  
212.576.2701 naikgroup.com

OWEIS  
100 East Hanover Ave., Suite 101, Cedar Knolls, NJ 07927  
973.539.440 oweisengineering.com

KEY PLAN



REGISTRATION



NYC SBS JOB NUMBER

20220059

ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	2023-01-25	ADDENDUM REVISION 1
1	2022-11-11	BID SET

PROJECT/TERM CONTRACT NUMBER

Contract No. 18-2586

SHEET TITLE

ELEVATIONS - PIER A  
INLET VENEER

SHEET NUMBER

L-347.00

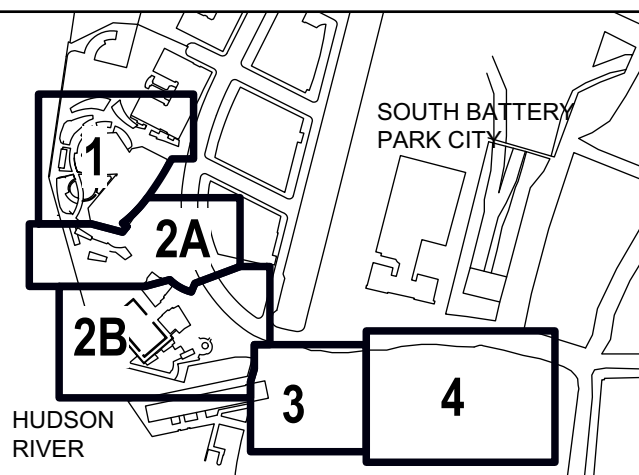
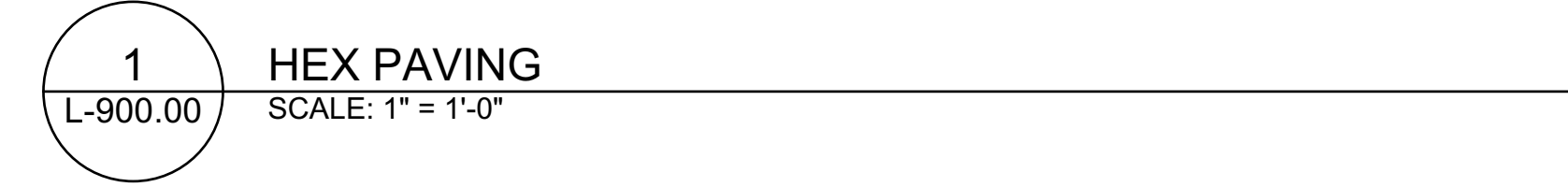
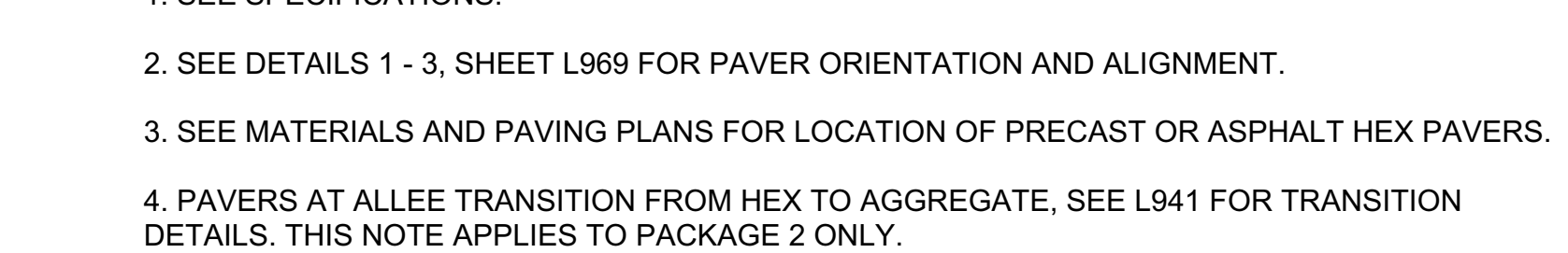
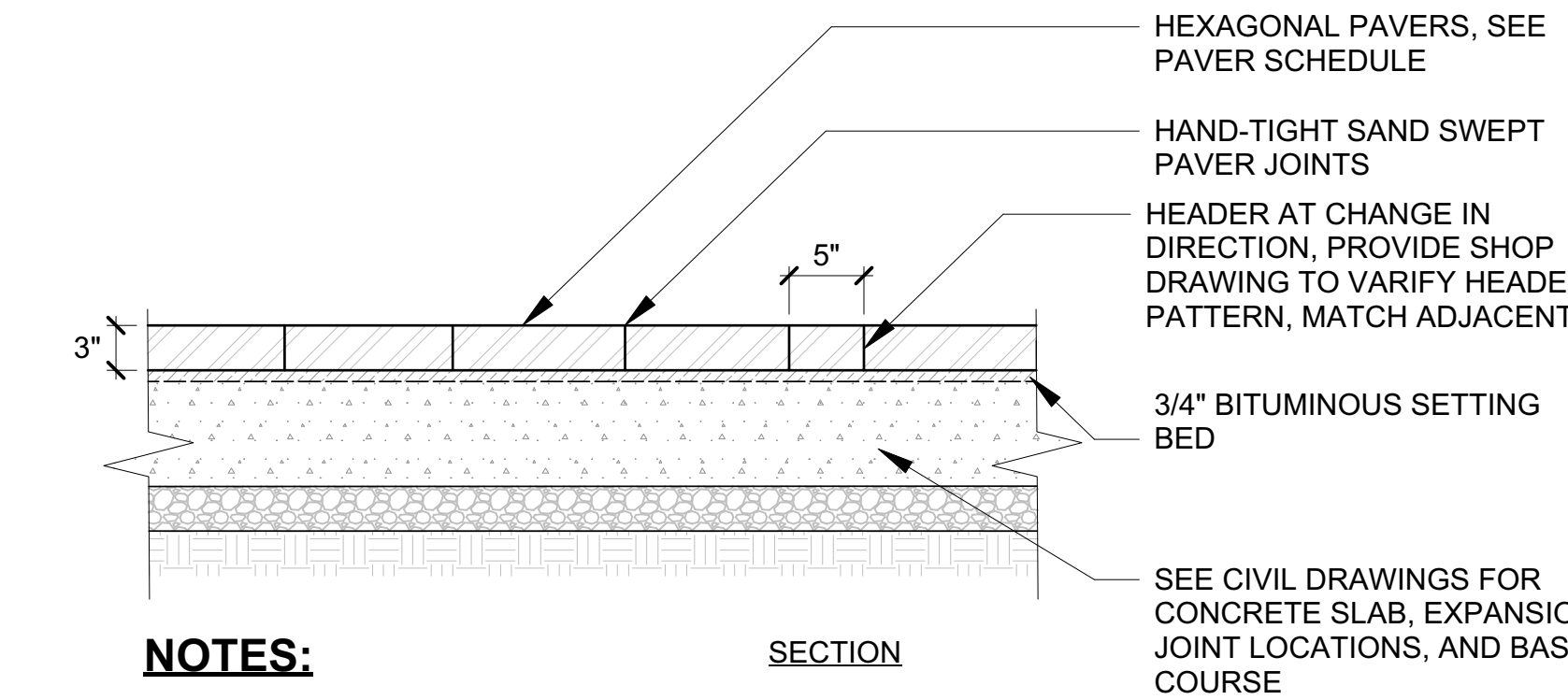
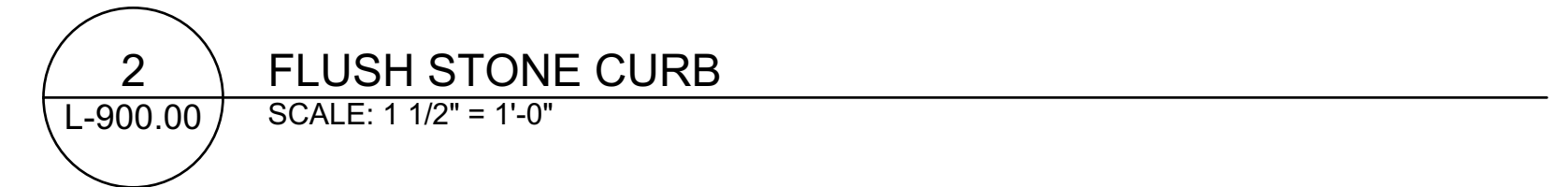
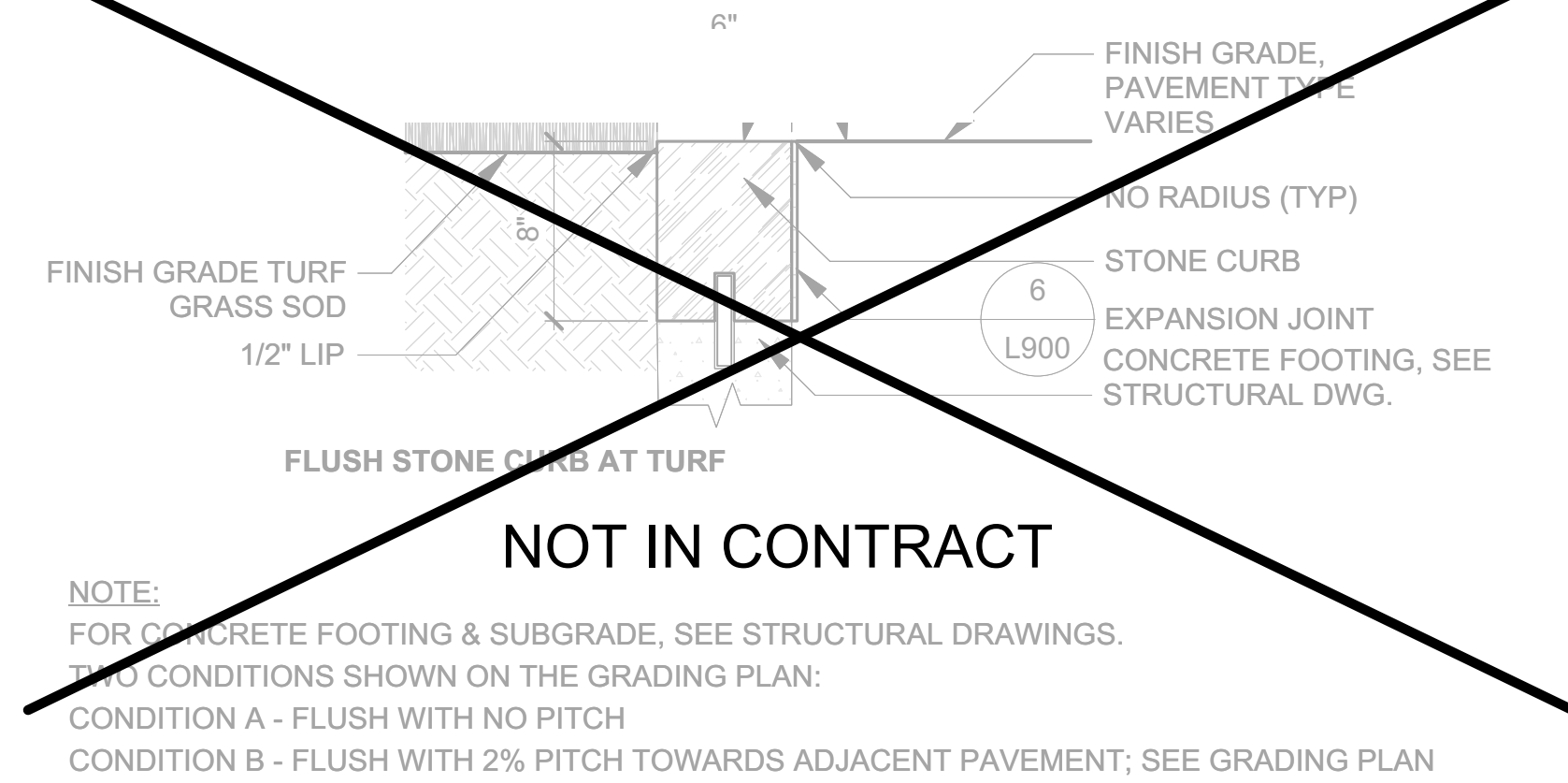
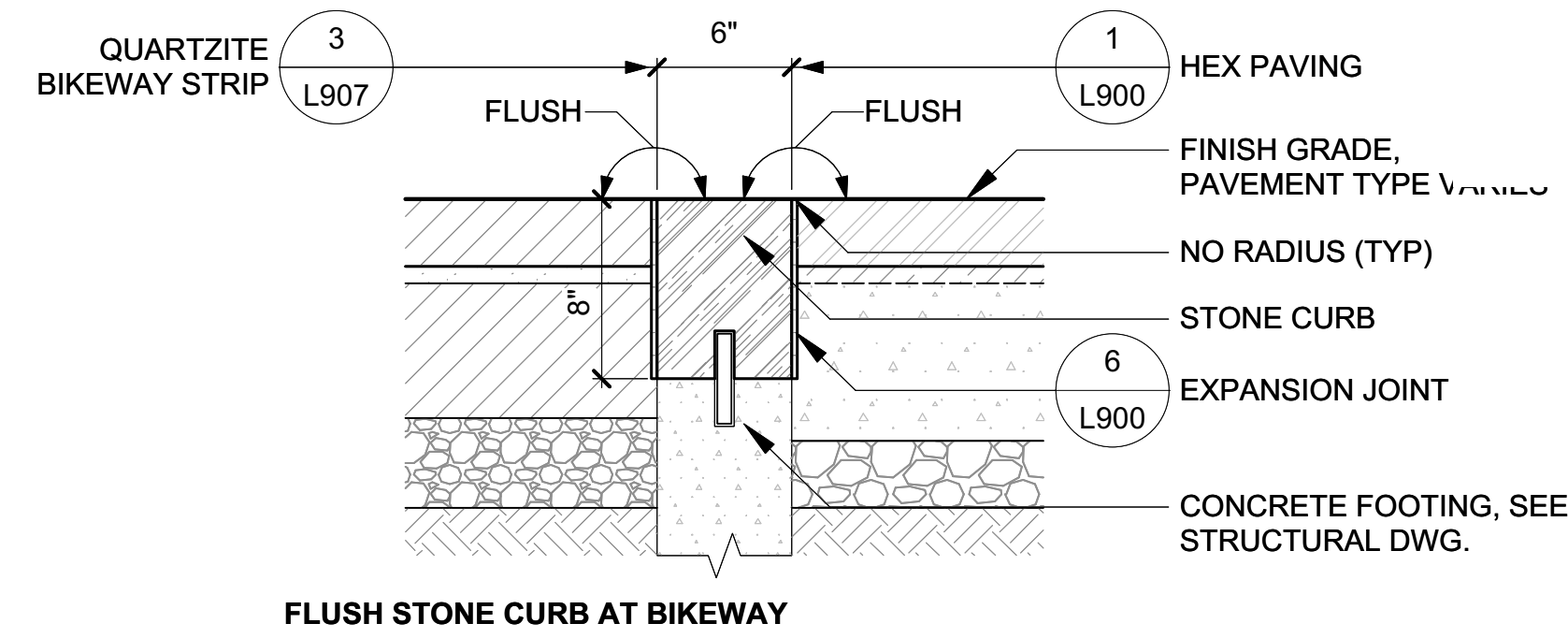
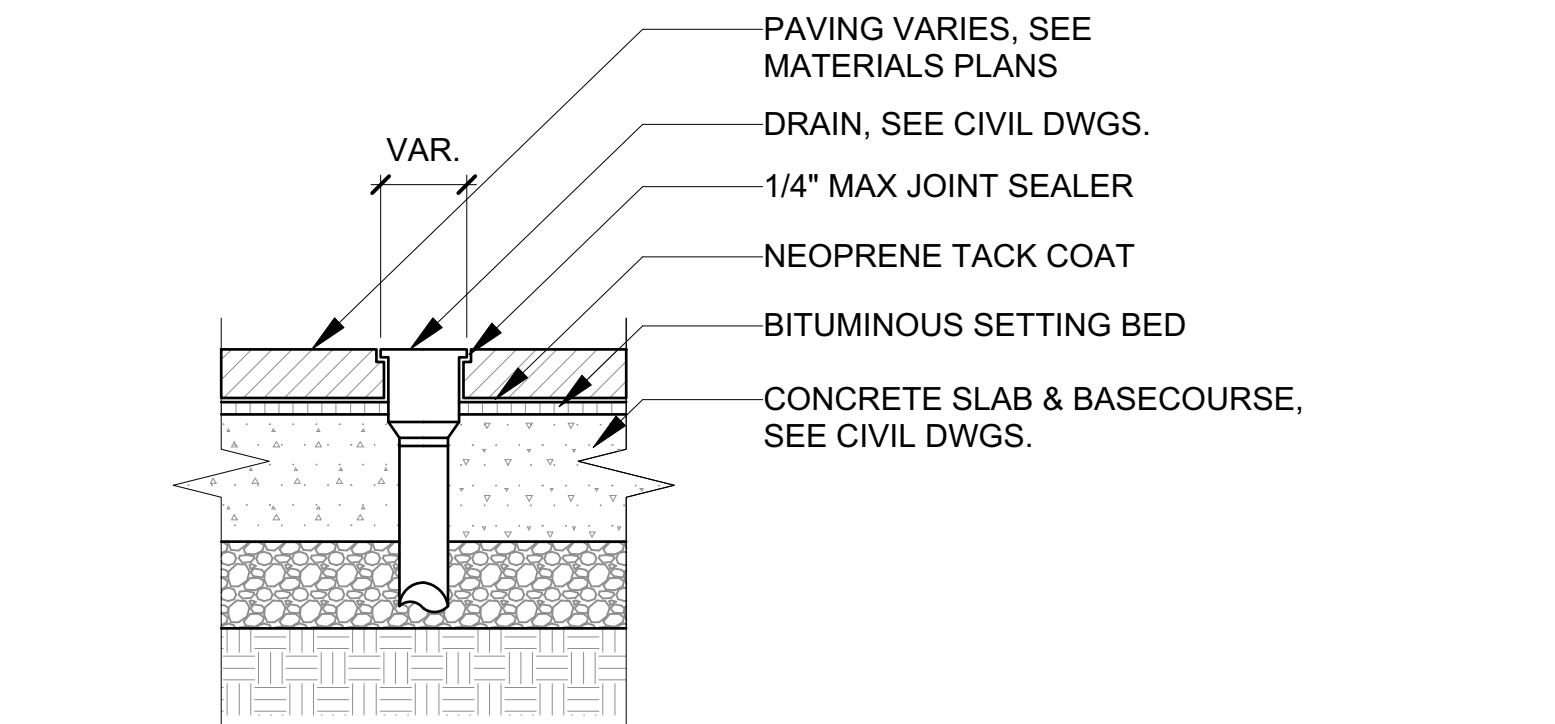
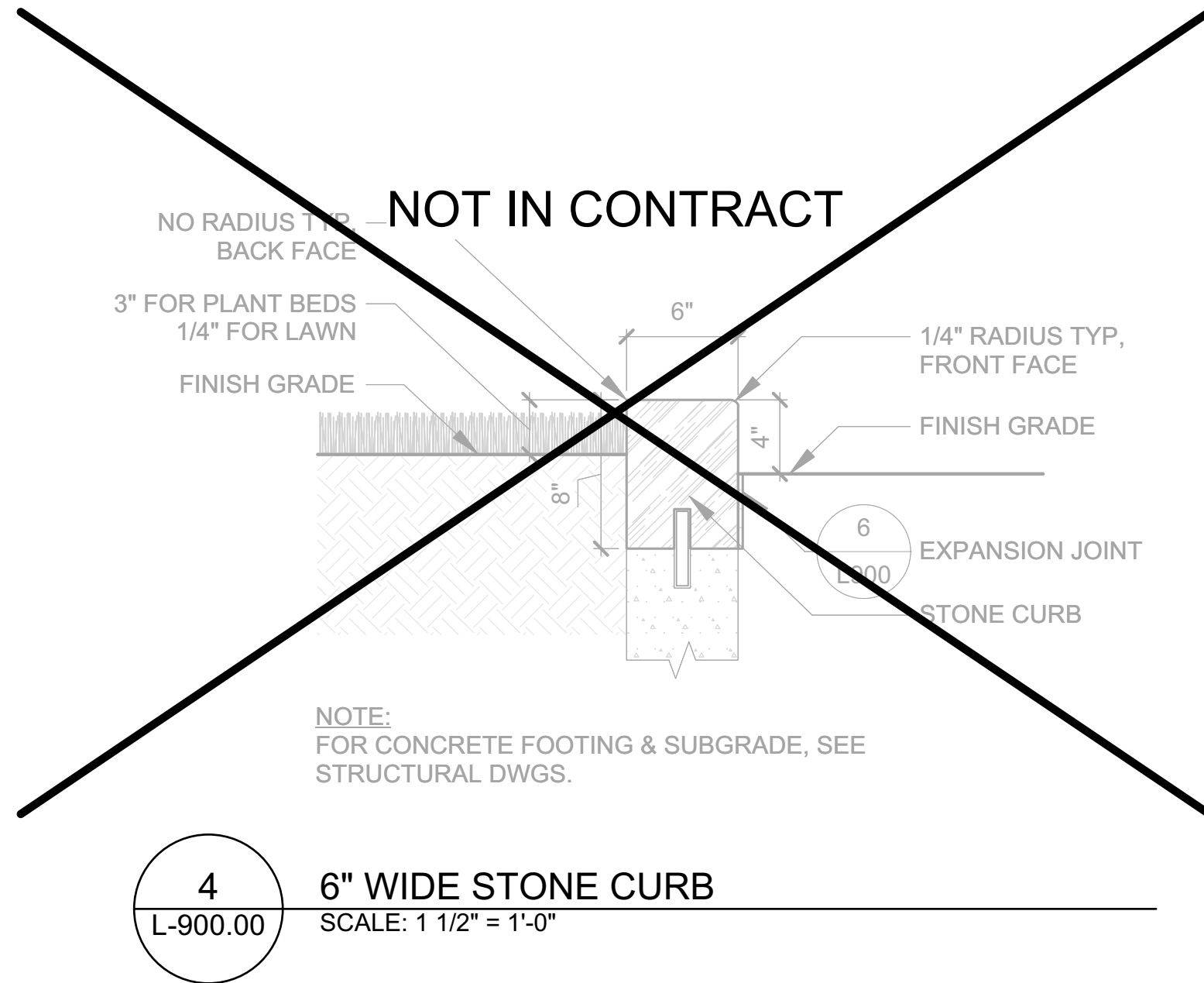
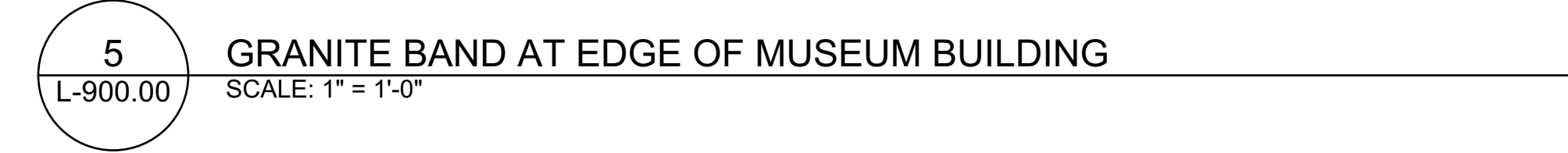
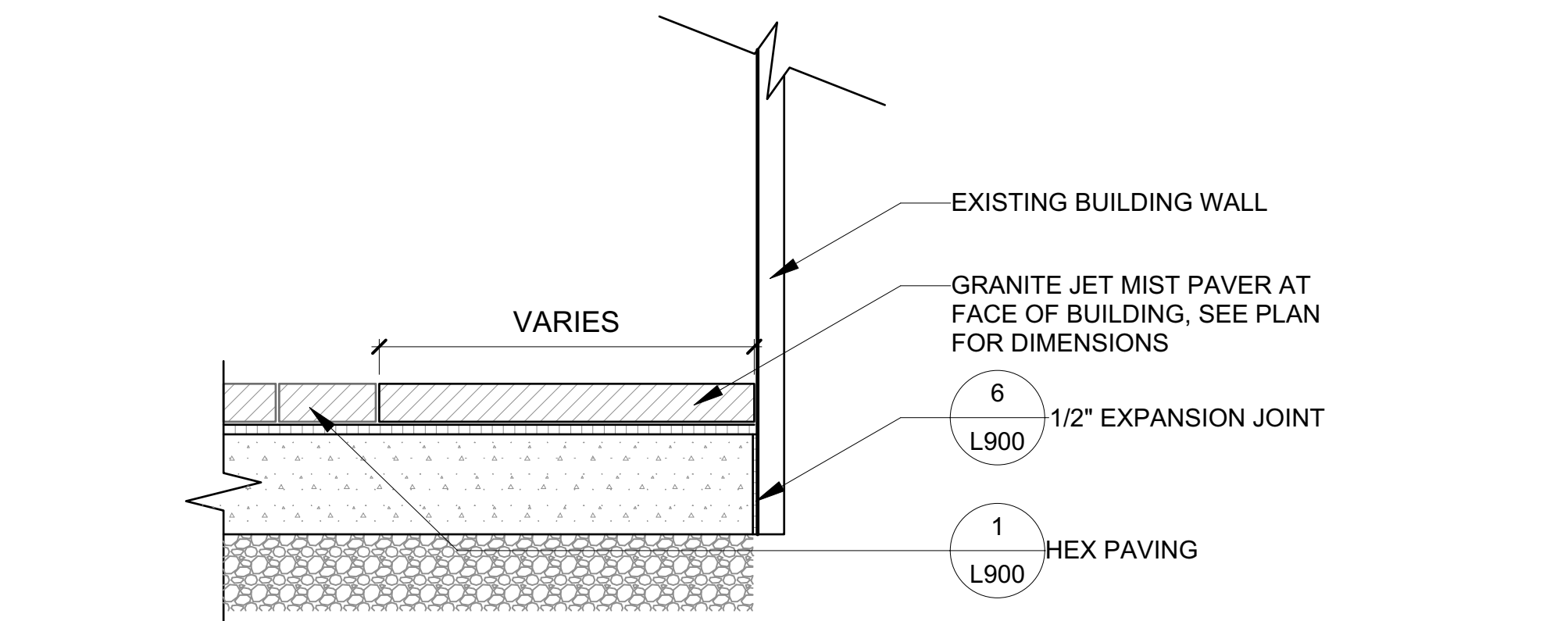
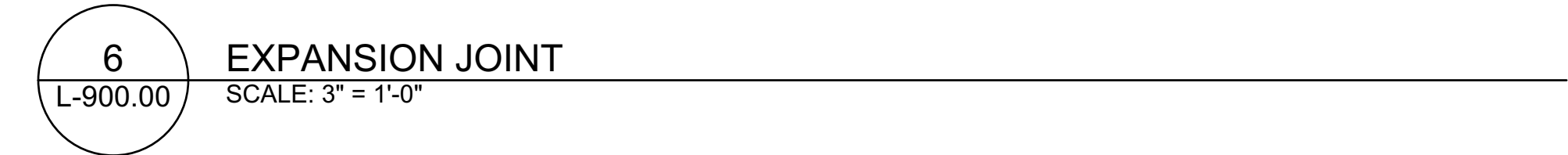
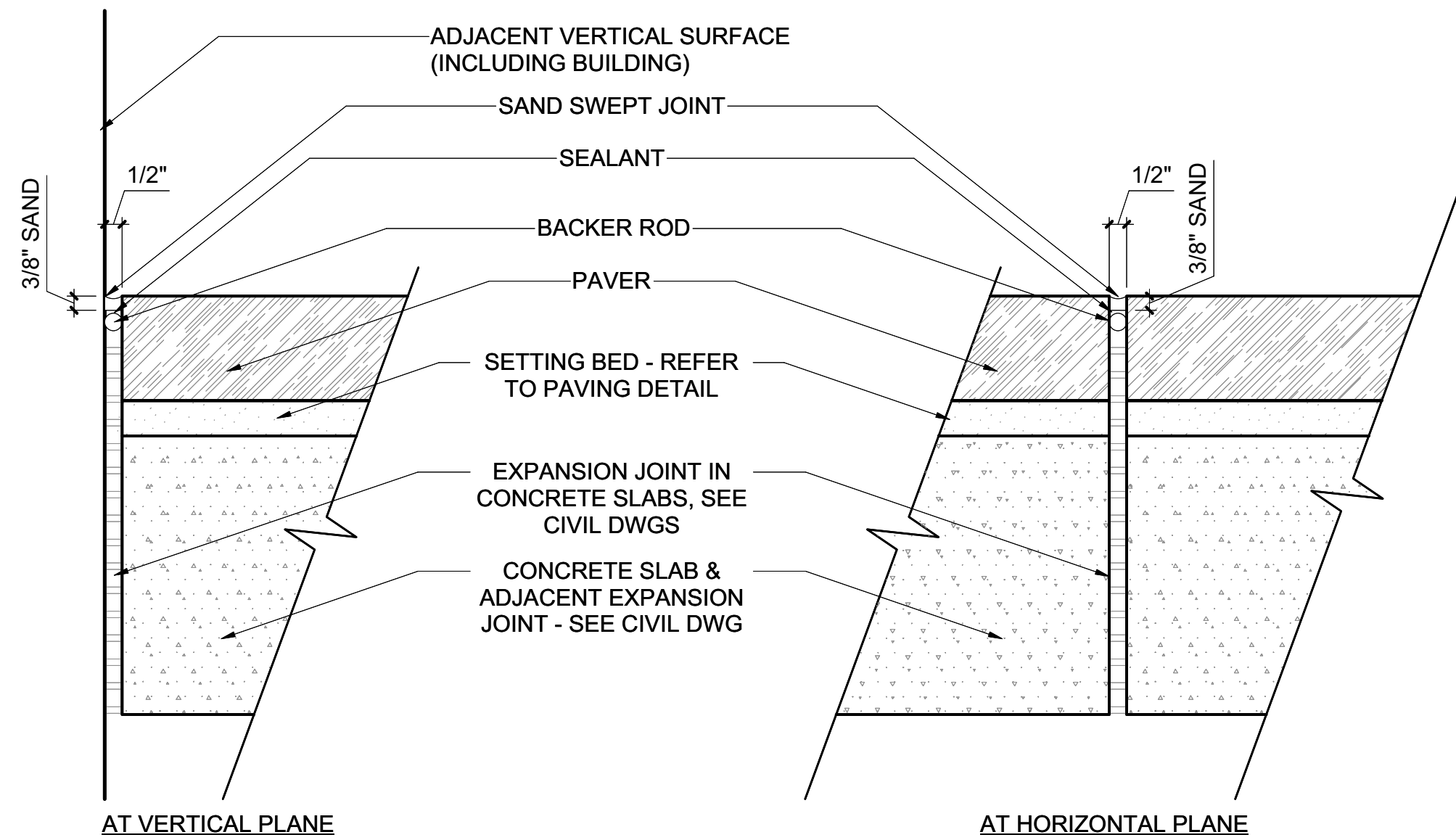
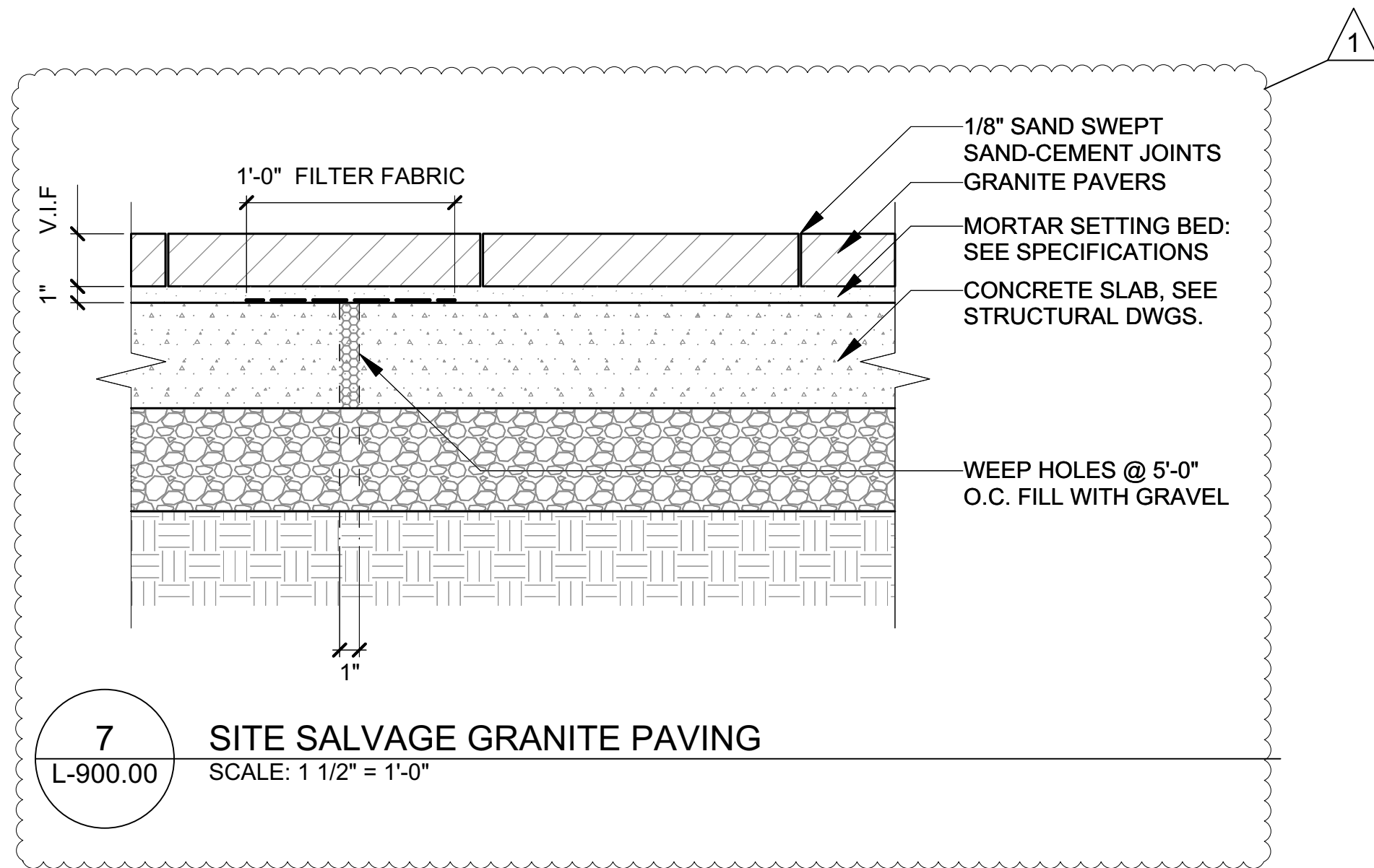


## PAGE NUMBER OF







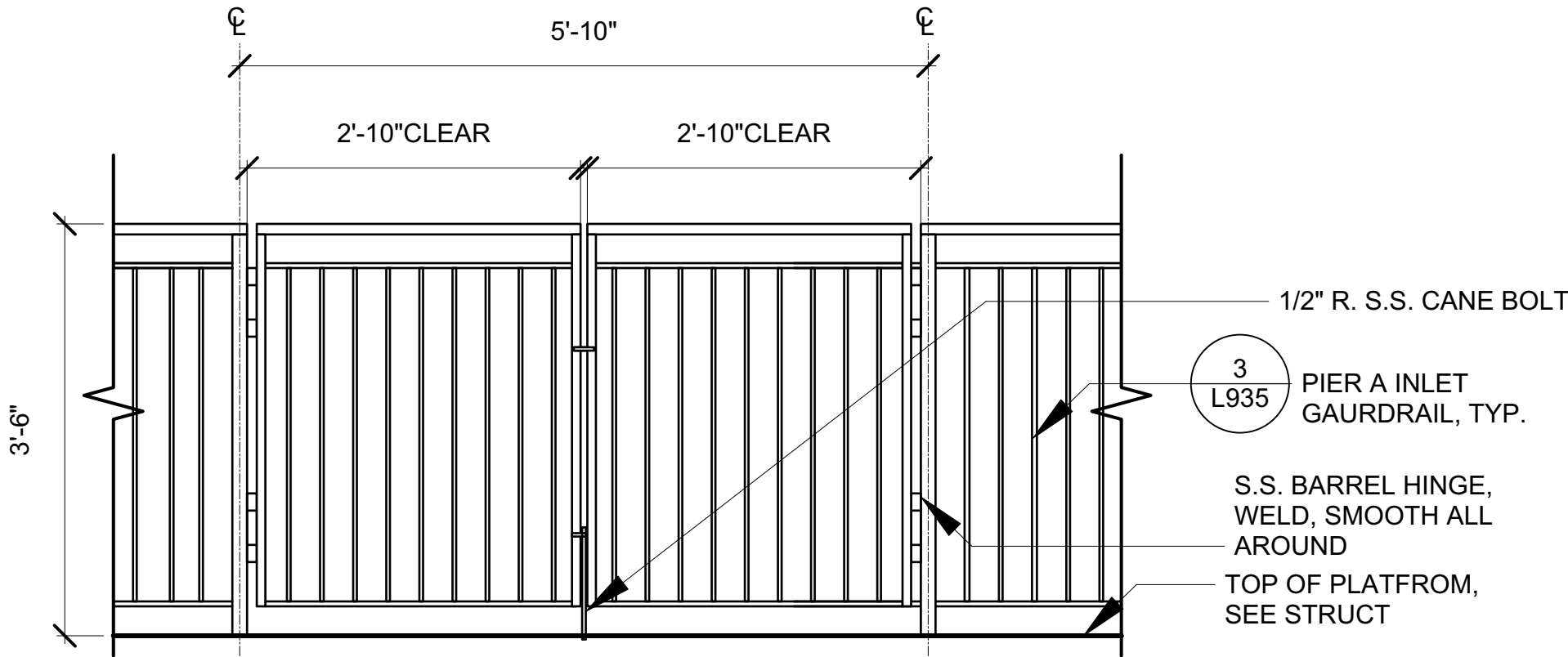


NO.	DATE	DESCRIPTION
1	2023-01-25	ADDENDUM REVISION 1
I	2022-11-11	BID SET
I/R	DATE	DESCRIPTION



NOTES:

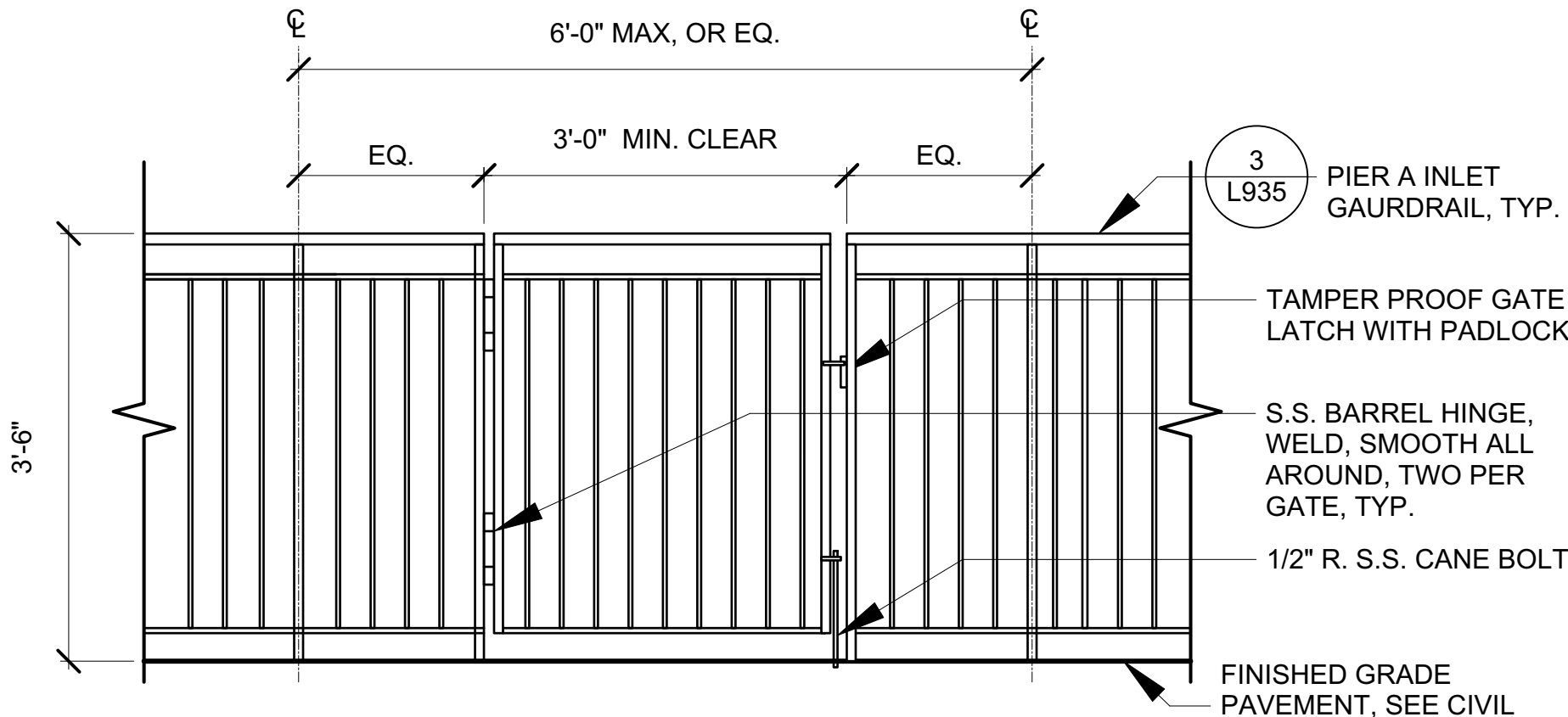
1. CONTRACTOR TO PROVIDE ALL S.S. ATTACHEMENTS AND FIXTURES REQUIRED. PROVIDE SHOP DRAWINGS FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
2. MATCH POST SPACING WITH STRUCT. MIN. AND MAX. AS REQUIRED



4 DOUBLE GATE IN PIER A INLET PLATFORM GUARDRAIL  
L-932.00 SCALE: 3/4" = 1'-0"

NOTES:

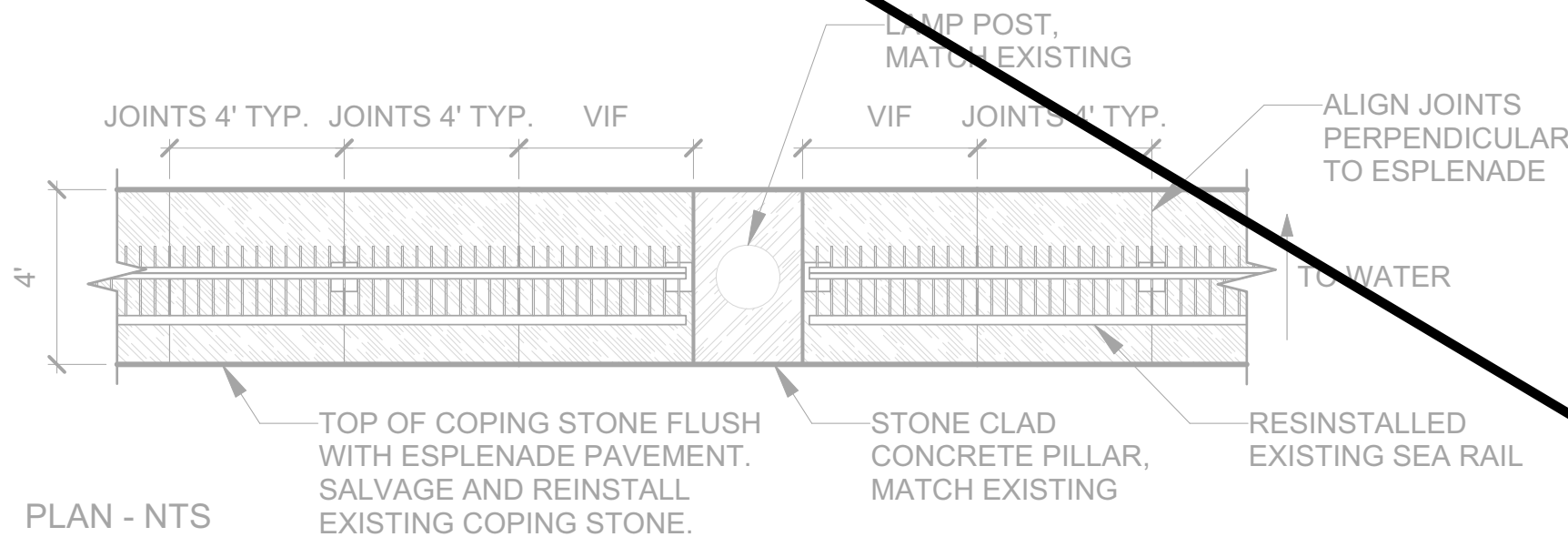
1. CONTRACTOR TO PROVIDE ALL S.S. ATTACHEMENTS AND FIXTURES REQUIRED. PROVIDE SHOP DRAWINGS FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
2. MATCH POST SPACING WITH STRUCT. MIN. AND MAX. AS REQUIRED



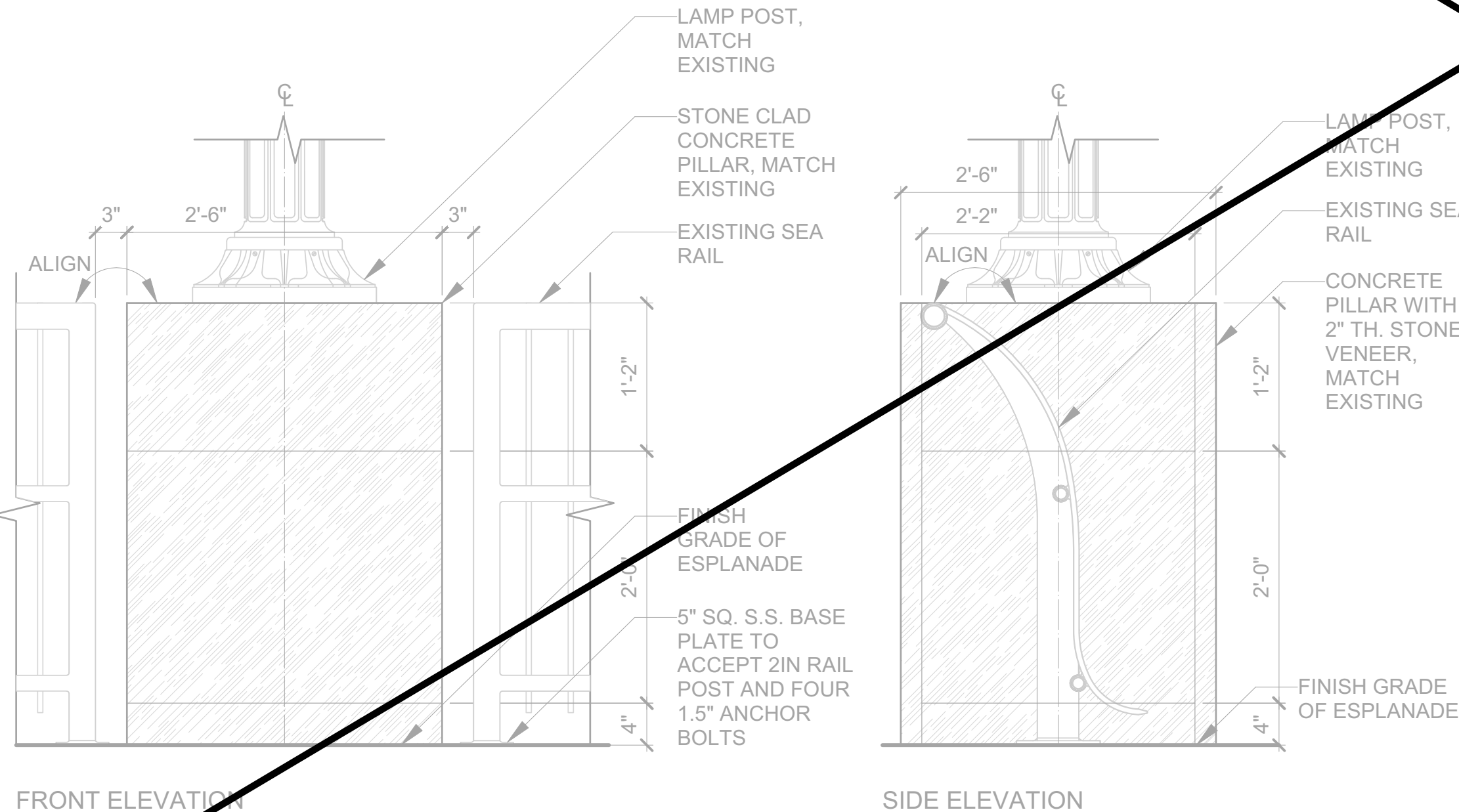
2 SINGLE GATE IN PIER A INLET GUARDRAIL  
L-932.00 SCALE: 3/4" = 1'-0"

NOTES:

1. PIER A INLET BULK-HEAD COPING STONE AND LIGHT COLUMN VENEER TO BE TYPE F GRANITE.
2. COORDINATE WITH CONTRACTOR PROVIDED SALVAGE INVENTORY AND SHOP DRAWINGS.
3. COORDINATE WITH STRUCTURAL AS REQUIRED .



PLAN - NTS



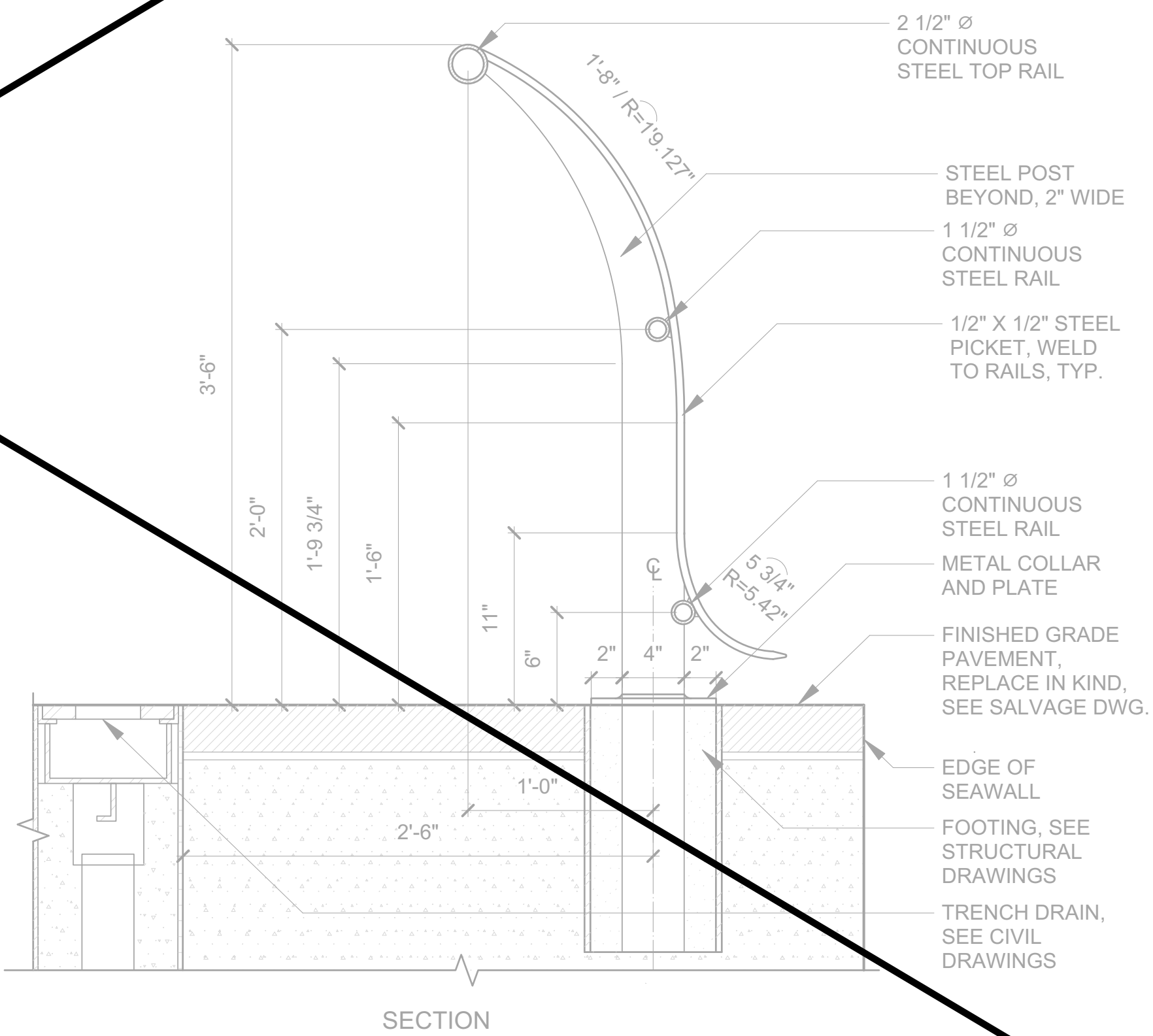
FRONT ELEVATION

SIDE ELEVATION

3 SEA RAIL PILLAR WITH LIGHT  
L-932.00 SCALE: 1" = 1'-0"

POSTS @ 7'-0" O.C.  
MATCH EXISTING

ELEVATION - SCALE 1" = 1'-0"



1 SEA RAIL  
L-932.00 SCALE: 1 1/2" = 1'-0"

NIC

PROJECT

SOUTH BATTERY PARK CITY  
RESILIENCY DESIGN  
SERVICES

CLIENT

HUGH L. CAREY  
BATTERY PARK CITY AUTHORITY

CONSULTANT

AECOM

AECOM USA  
605 3rd Ave, 2nd Floor, New York, NY 10158  
212.973.2900 tel www.aecom.com

SUB-CONSULTANT

MAGNUSON KLEMENCIC ASSOCIATES  
1301 Fifth Avenue, Suite 3200, Seattle, WA 98101-2699  
206.292.1200 tel 206.292.1201 fax www.mka.com

SITE WORKS

150 West 28th St., Suite 605  
New York, NY 10001 212.255.8350 siteworkscm.com

MILHOUSE

333 South Wabash Ave., Suite 2901,  
Chicago, IL 60604 313.987.0061 milhouseinc.com

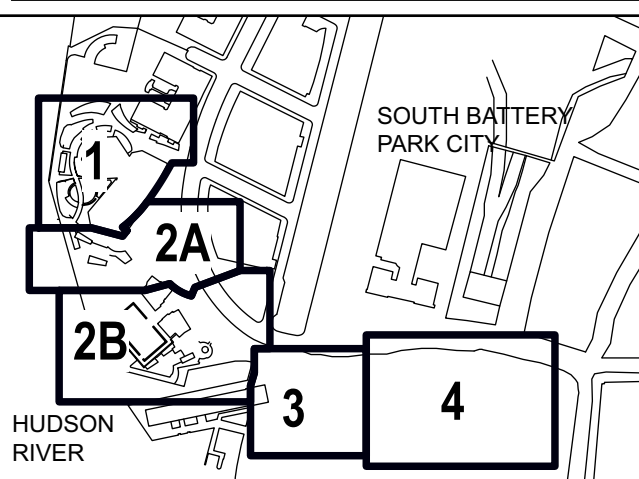
TILLOTSON DESIGN ASSOCIATES  
40 Worth St. Rm 705, New York, NY 10013  
212.675.7760 tillotsondesign.com

THOMAS PHIFER AND PARTNERS  
180 Varick St. New York, NY 10014  
212.337.0334 thomasphifer.com

NAIK CONSULTING GROUP, PC  
111 West 33rd St., Suite 605 New York, NY 10120  
212.576.2701 naikgroup.com

OWEIS  
100 East Hanover Ave., Suite 101, Cedar Knolls, NJ 07927  
973.539.440 oweisengineering.com

KEY PLAN



REGISTRATION



NYC SBS JOB NUMBER

20220059

ISSUE/REVISION

I/R	DATE	DESCRIPTION
1	2023-01-25	ADDENDUM REVISION 1
I	2022-11-11	BID SET
I/R	DATE	DESCRIPTION

PROJECT/TERM CONTRACT NUMBER

Contract No. 18-2586

SHEET TITLE

DETAILS - HANDRAILS,  
SEA RAIL, AND POLES

SHEET NUMBER

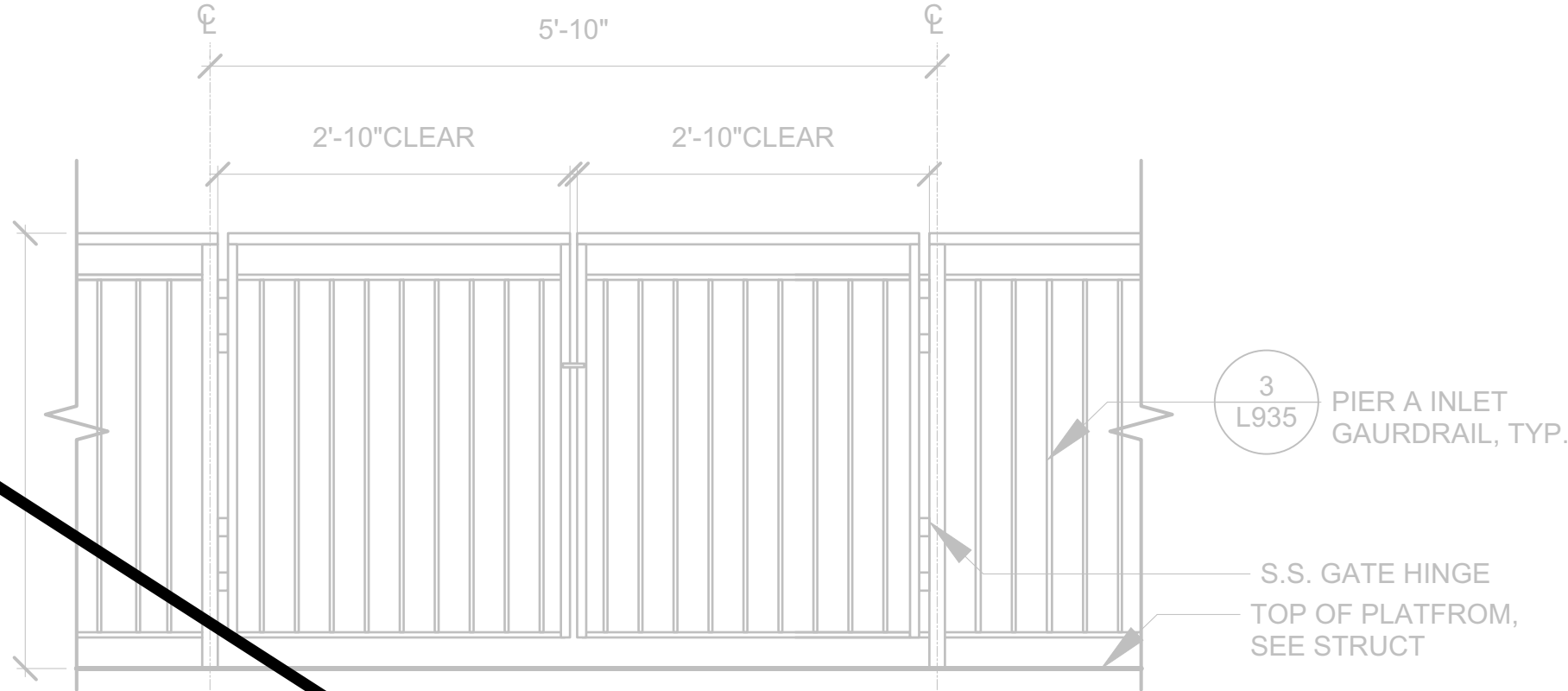
L-932.00



ANSI D 22' x 33'

NOTES:

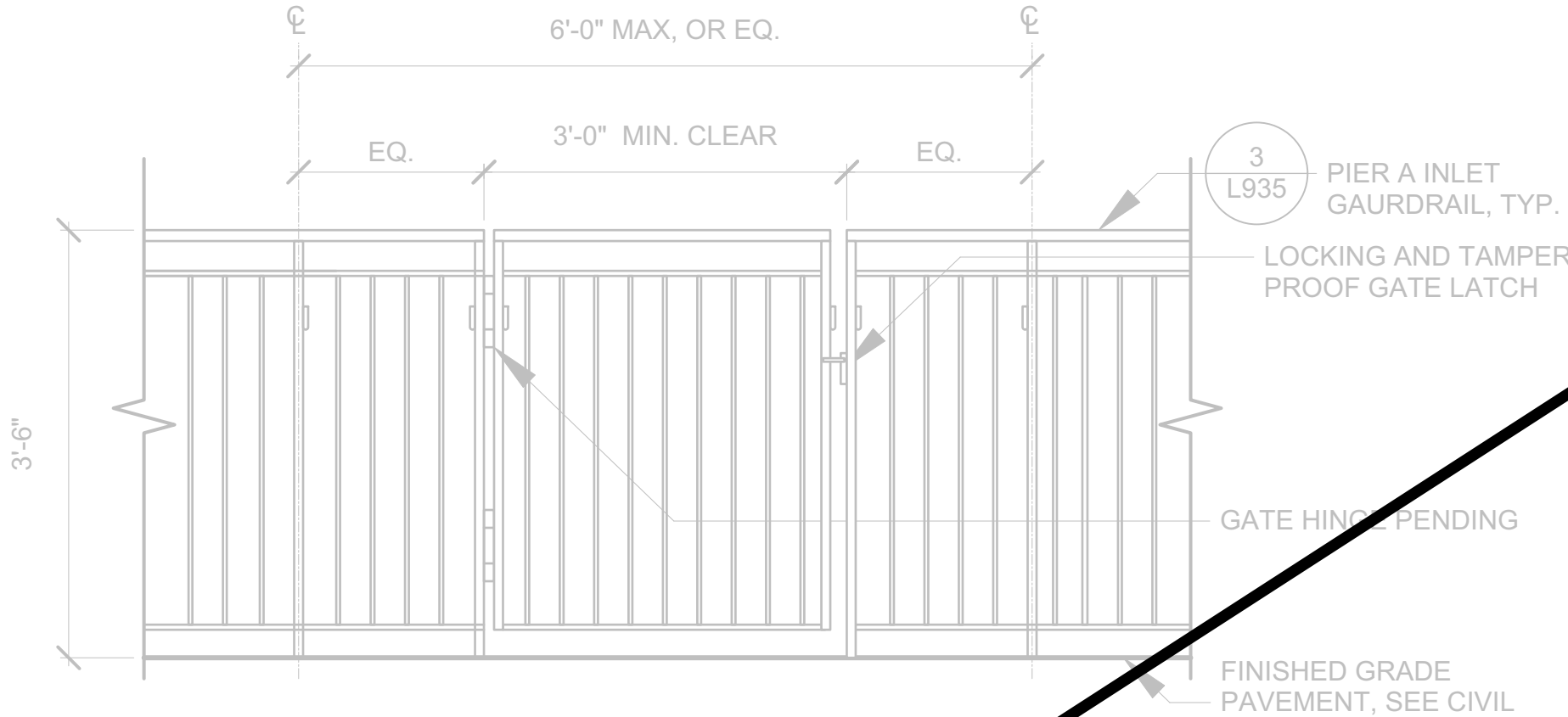
1. CONTRACTOR TO PROVIDE ALL S.S. ATTACHEMENTS AND FIXTURES REQUIRED. PROVIDE SHOP DRAWINGS FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
2. MATCH POST SPACING WITH STRUCT. MIN. AND MAX. AS REQUIRED



4 DOUBLE GATE IN PIER A INLET PLATFORM GUARDRAIL  
L-932.00 SCALE: 3/4" = 1'-0"

NOTES:

1. CONTRACTOR TO PROVIDE ALL S.S. ATTACHEMENTS AND FIXTURES REQUIRED. PROVIDE SHOP DRAWINGS FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
2. MATCH POST SPACING WITH STRUCT. MIN. AND MAX. AS REQUIRED

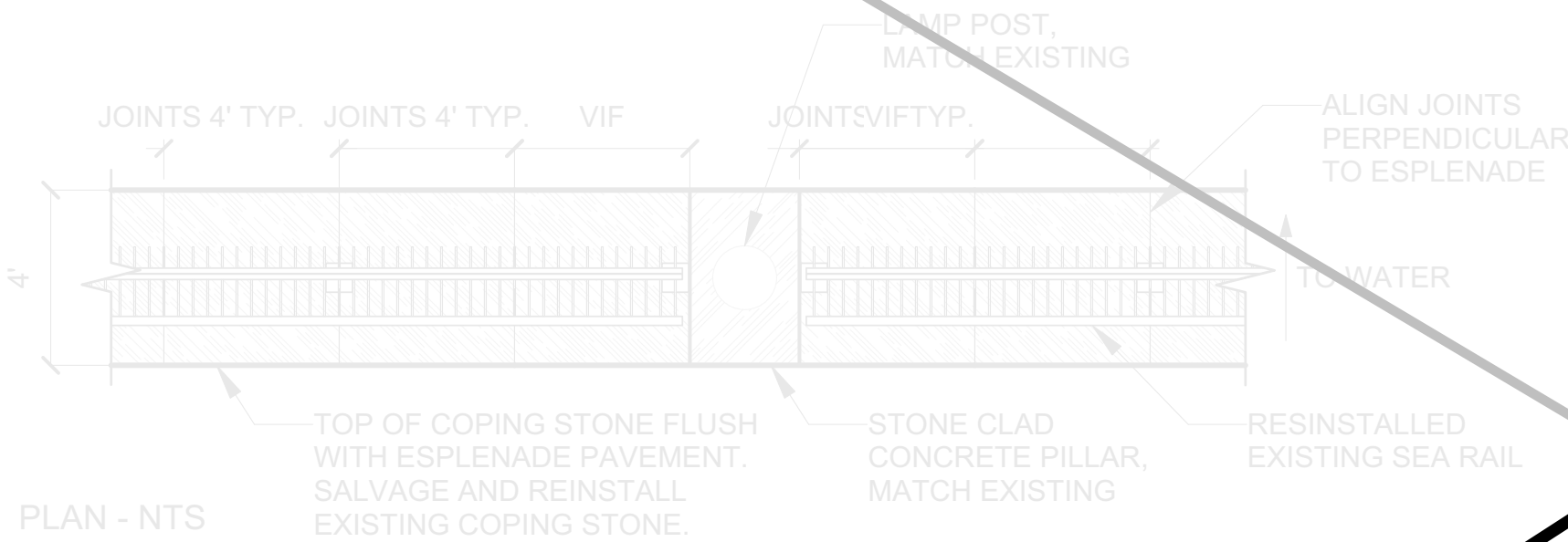


2 SINGLE GATE IN PIER A INLET GUARDRAIL  
L-932.00 SCALE: 3/4" = 1'-0"

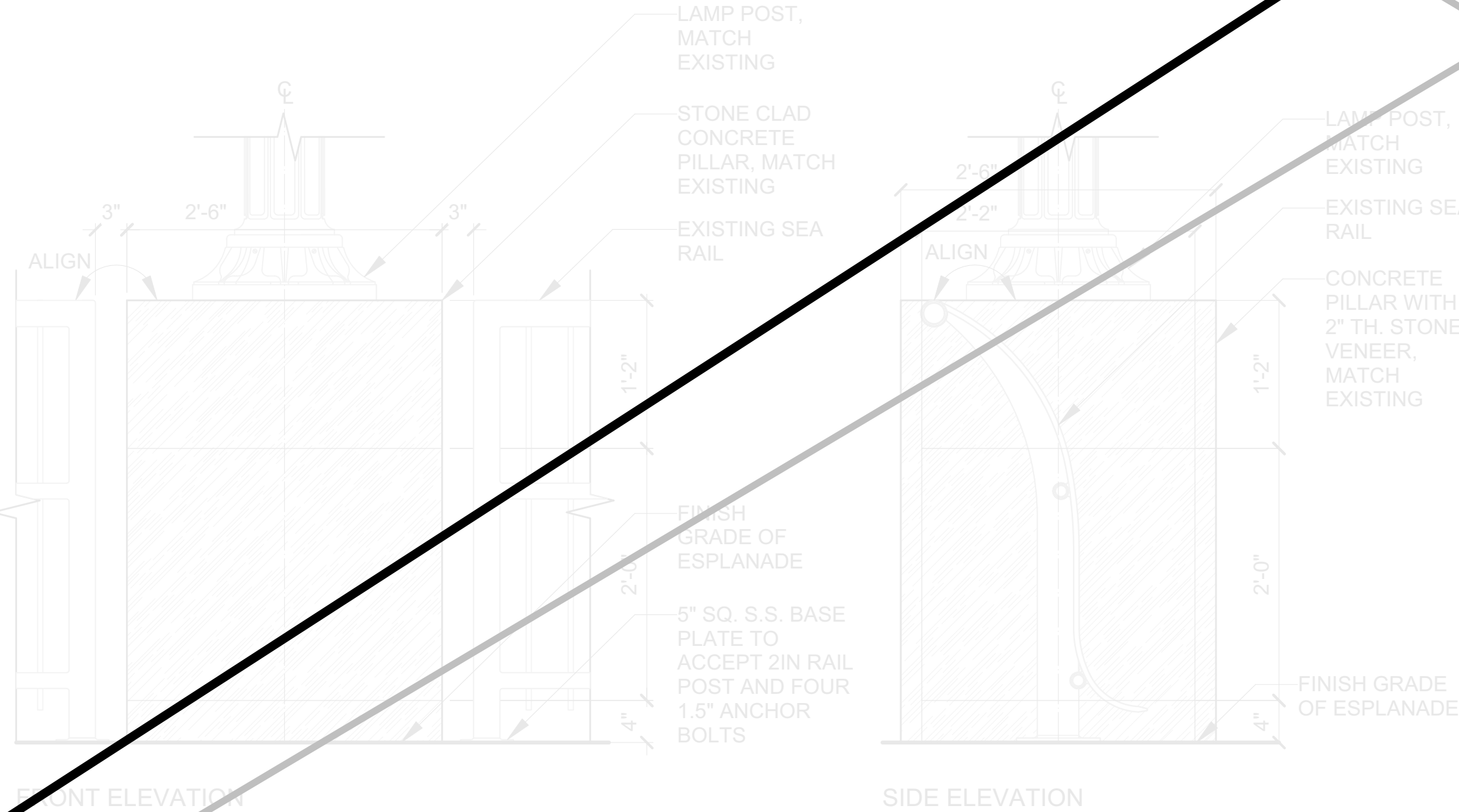
PAGE NOT IN USE

NOTES:

1. PIER A INLET BULK-HEAD COPING STONE AND LIGHT COLUMN VENEER TO BE TYPE F GRANITE.
2. COORDINATE WITH CONTRACTOR PROVIDED SALVAGE INVENTORY AND SHOP DRAWINGS.
3. COORDINATE WITH STRUCTURAL AS REQUIRED.



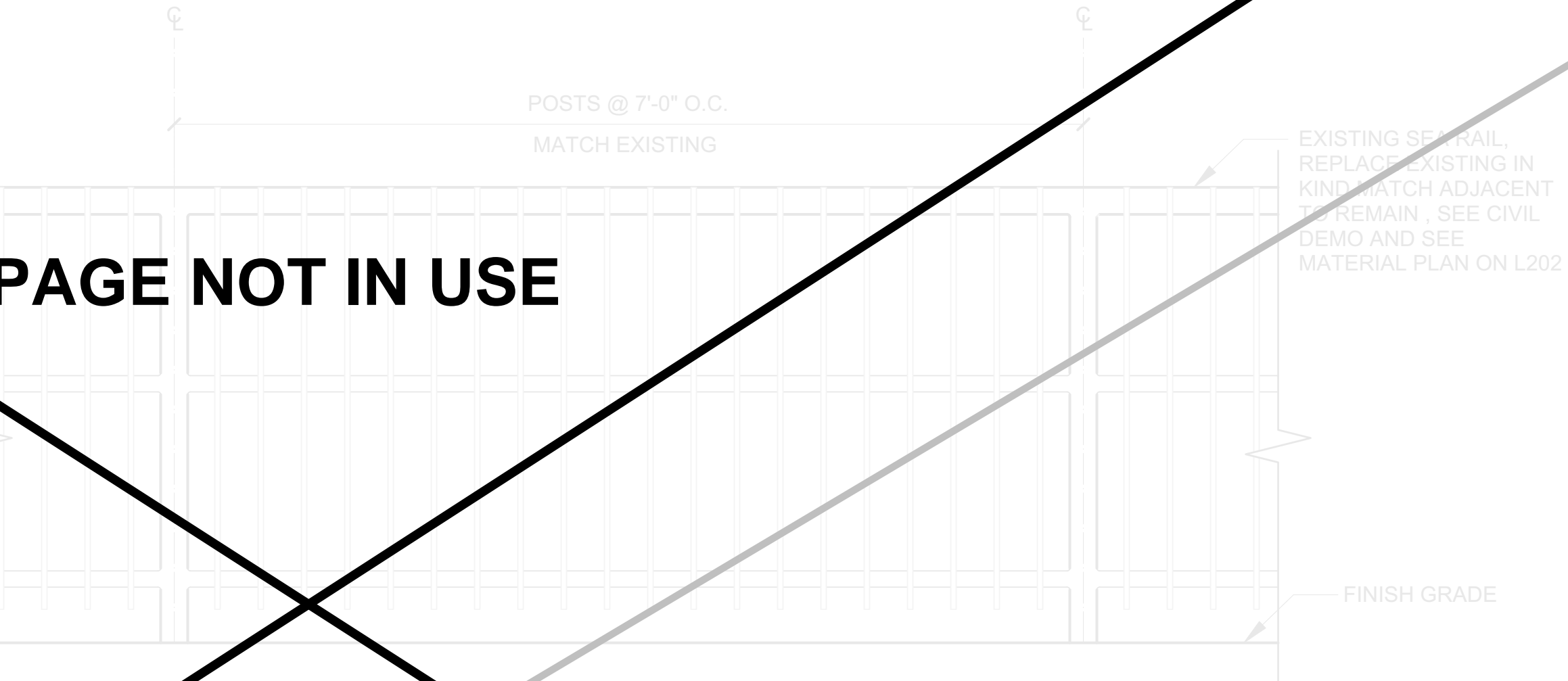
PLAN - NTS



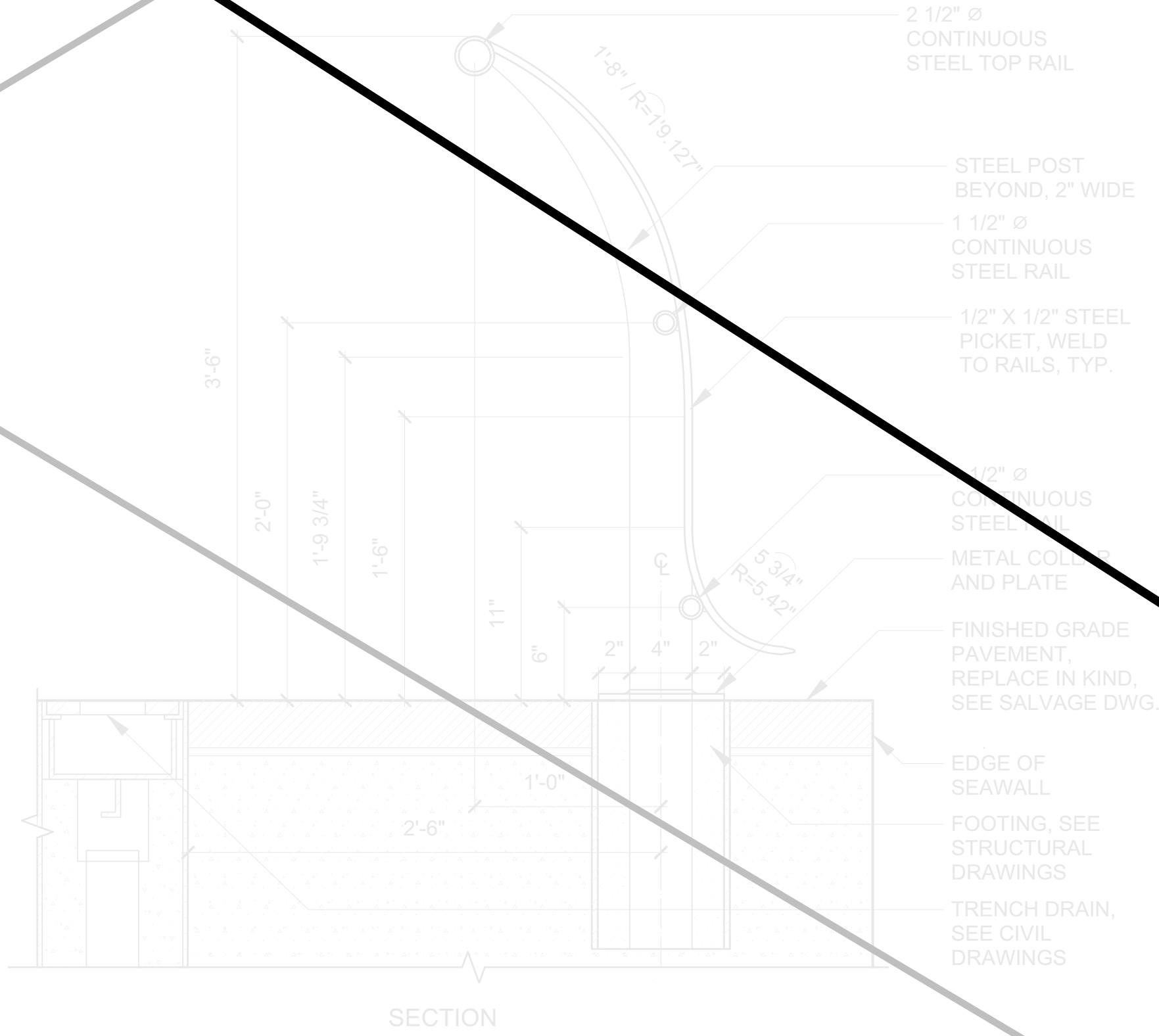
FRONT ELEVATION

SIDE ELEVATION

3 SEA RAIL PILLAR WITH LIGHT  
L-932.00 SCALE: 1" = 1'-0"



ELEVATION - SCALE 1" = 1'-0"



1 SEA RAIL  
L-932.00 SCALE: 1 1/2" = 1'-0"

NIC

AECOM

PROJECT

SOUTH BATTERY PARK CITY  
RESILIENCY DESIGN  
SERVICES

CLIENT

HUGH L. CAREY  
BATTERY PARK CITY AUTHORITY

CONSULTANT

AECOM

AECOM USA  
605 3rd Ave, 2nd Floor, New York, NY 10158  
212.973.2900 tel www.aecom.com

SUB-CONSULTANT

MAGNUSON KLEMENCIC ASSOCIATES  
1301 Fifth Avenue, Suite 3200, Seattle, WA 98101-2699  
206.292.1200 tel 206.292.1201 fax www.mka.com

SITE WORKS  
150 West 28th St., Suite 605  
New York, NY 10001 212.255.8350 siteworkscm.com

MILHOUSE  
333 South Wabash Ave, Suite 2501  
Chicago, IL 60604 313.987.0061 milhouseinc.com

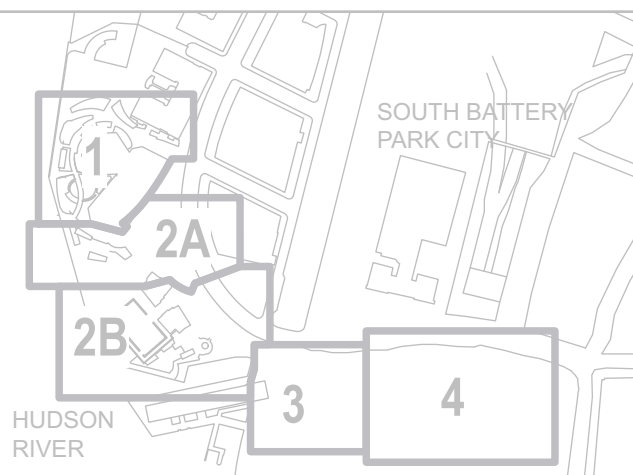
TILLOTSON DESIGN ASSOCIATES  
40 Worth St. Rm 705, New York, NY 10013  
212.675.7760 tillotsondesign.com

THOMAS PHIFER AND PARTNERS  
180 Varick St. New York, NY 10014  
212.337.0334 thomasphifer.com

NAIK CONSULTING GROUP, PC  
111 West 33rd St., Suite 605 New York, NY 10120  
212.576.2701 naikgroup.com

OWEIS  
100 East Hanover Ave., Suite 101, Cedar Knolls, NJ 07927  
973.539.440 oweisengineering.com

KEY PLAN



REGISTRATION



NYC SBS JOB NUMBER

ISSUE/REVISION

I	DATE	BID SET
I/R	DATE	DESCRIPTION

PROJECT/TERM CONTRACT NUMBER

Contract No. 18-2586

SHEET TITLE

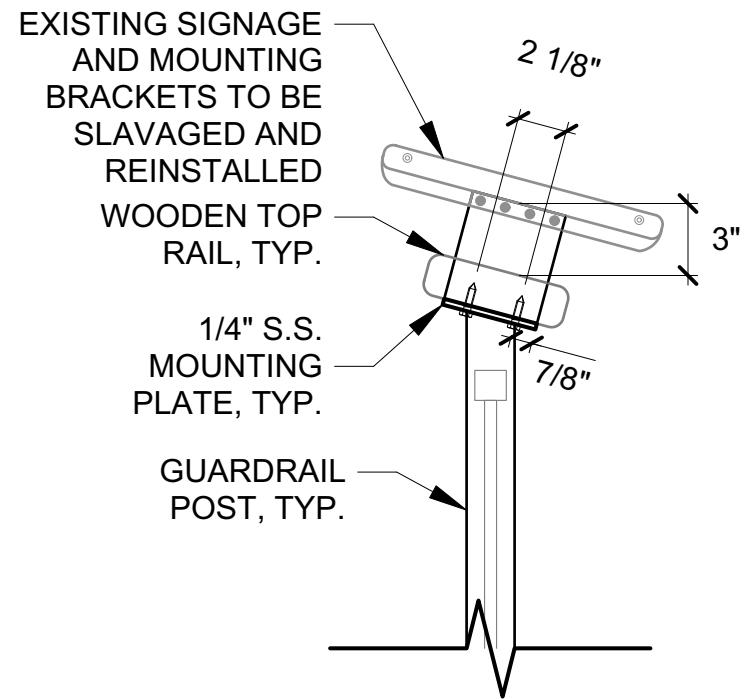
DETAILS - HANDRAILS,  
SEA RAIL, AND POLES

SHEET NUMBER

L-932.00

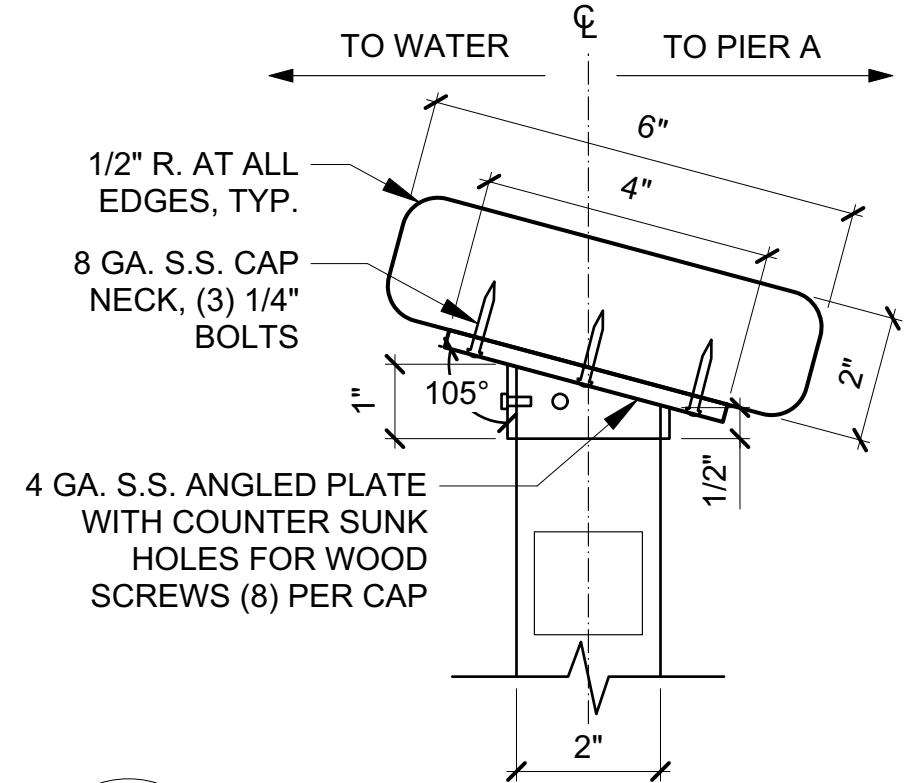
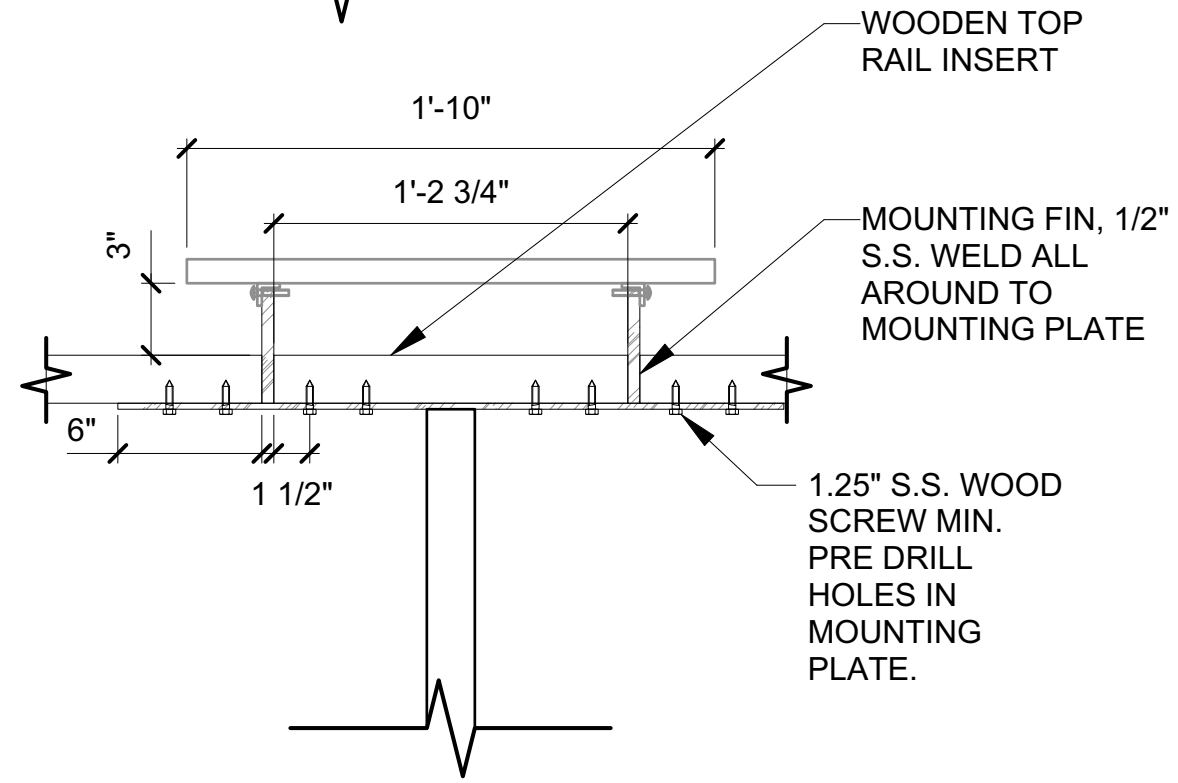
PAGE NUMBER 144 OF 170





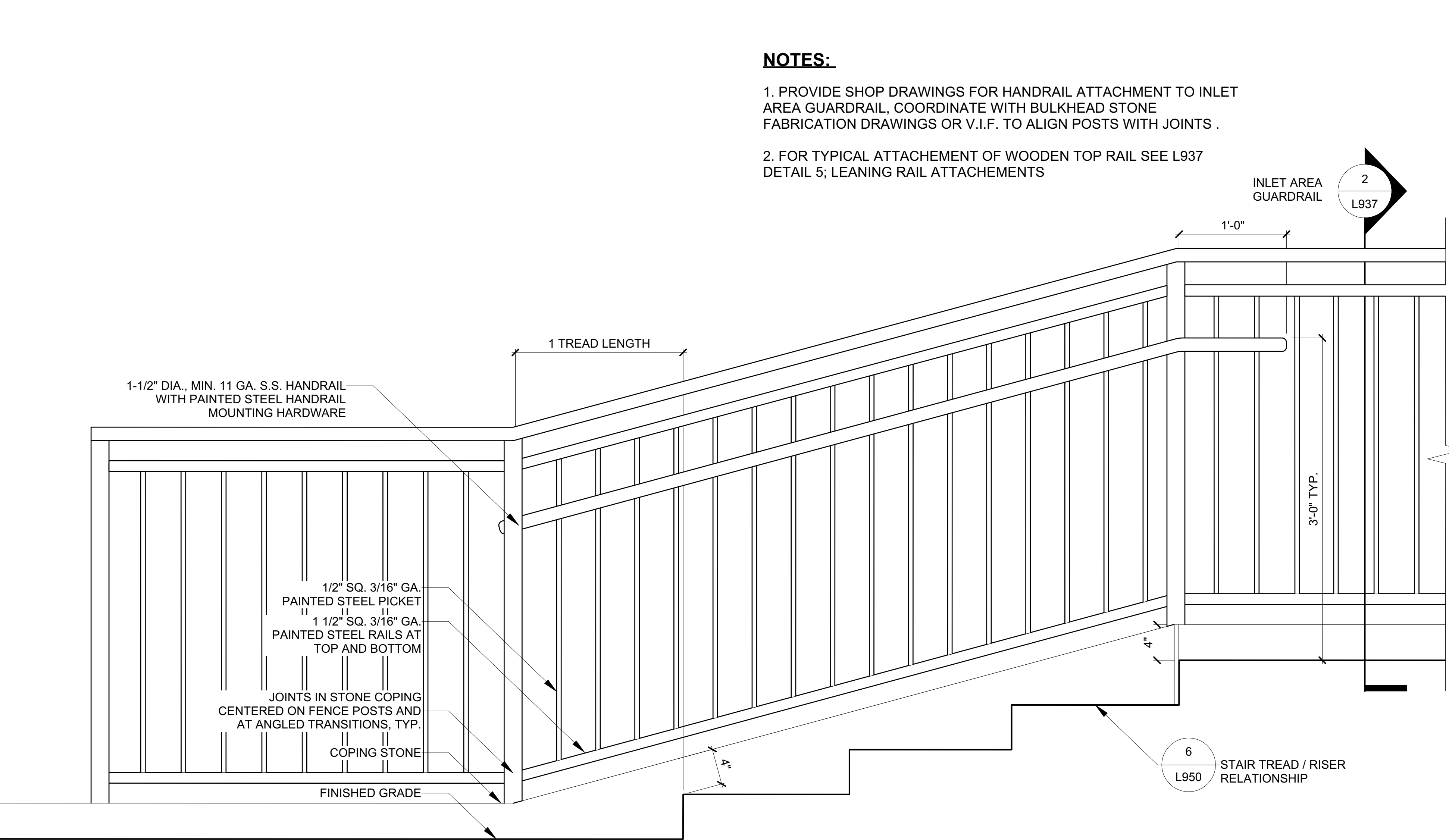
NOTES:

1. COORDINATE WOODEN SCREWS, MOUNTING PLATE, FIN AND GUARDRAIL SHOP DRAWINGS AS NEEDED TO MEET DESIGN INTENT PROVIDED.
2. PROVIDE STAMPED AND SEALED ENG. DRAWINGS AS REQUIRED. VERIFY DEFLECTION AND TOP RAIL MOUNTING.



3 PIER A HISTORICAL SIGN. MOUNTING  
SCALE: 1 1/2" = 1'-0"

2 INLET AREA GAURDRAIL TYPICAL HANDRAIL AT STAIRS- ELEVATION  
SCALE: 1 1/2" = 1'-0"



NOTES:

1. PROVIDE SHOP DRAWINGS FOR HANDRAIL ATTACHMENT TO INLET AREA GUARDRAIL, COORDINATE WITH BULKHEAD STONE FABRICATION DRAWINGS OR V.I.F. TO ALIGN POSTS WITH JOINTS .
2. FOR TYPICAL ATTACHEMENT OF WOODEN TOP RAIL SEE L937 DETAIL 5; LEANING RAIL ATTACHEMENTS

PROJECT

SOUTH BATTERY PARK CITY  
RESILIENCY DESIGN  
SERVICES

CLIENT

HUGH L. CAREY  
BATTERY PARK CITY AUTHORITY

CONSULTANT

AECOM

AECOM USA  
605 3rd Ave, 2nd Floor, New York, NY 10158  
212.973.2900 tel www.aecom.com

SUB-CONSULTANT

MAGNUSON KLEMENCIC ASSOCIATES  
1301 Fifth Avenue, Suite 3200, Seattle, WA 98101-2699  
206.292.1200 tel 206.292.1201 fax www.mka.com

SITE WORKS  
150 West 28th St., Suite 605  
New York, NY 10001 212.255.8350 siteworkscm.com

MILHOUSE  
333 South Wabash Ave, Suite 2901,  
Chicago, IL 60604 313.987.0061 milhouseinc.com

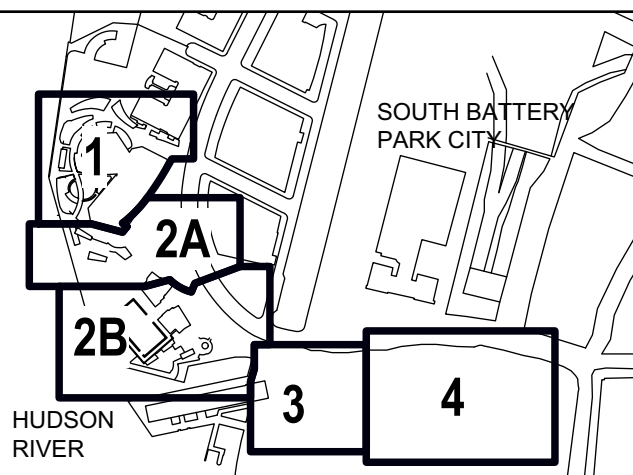
TILLOTSON DESIGN ASSOCIATES  
40 Worth St, Rm 705, New York, NY 10013  
212.675.7760 tilotsondesign.com

THOMAS PHIFER AND PARTNERS  
180 Varick St, New York, NY 10014  
212.337.0334 thomaspheifer.com

NAIK CONSULTING GROUP, PC  
111 West 33rd St., Suite 605 New York, NY 10120  
212.576.2701 naikgroup.com

OWEIS  
100 East Hanover Ave., Suite 101, Cedar Knolls, NJ 07927  
973.539.440 oweisengineering.com

KEY PLAN



REGISTRATION



NYC SBS JOB NUMBER

20220059

ISSUE/REVISION

NO.	DATE	DESCRIPTION
1	2023-01-25	ADDENDUM REVISION 1
I/R	2022-11-11	BID SET
I/R	DATE	DESCRIPTION

PROJECT/TERM CONTRACT NUMBER

Contract No. 18-2586

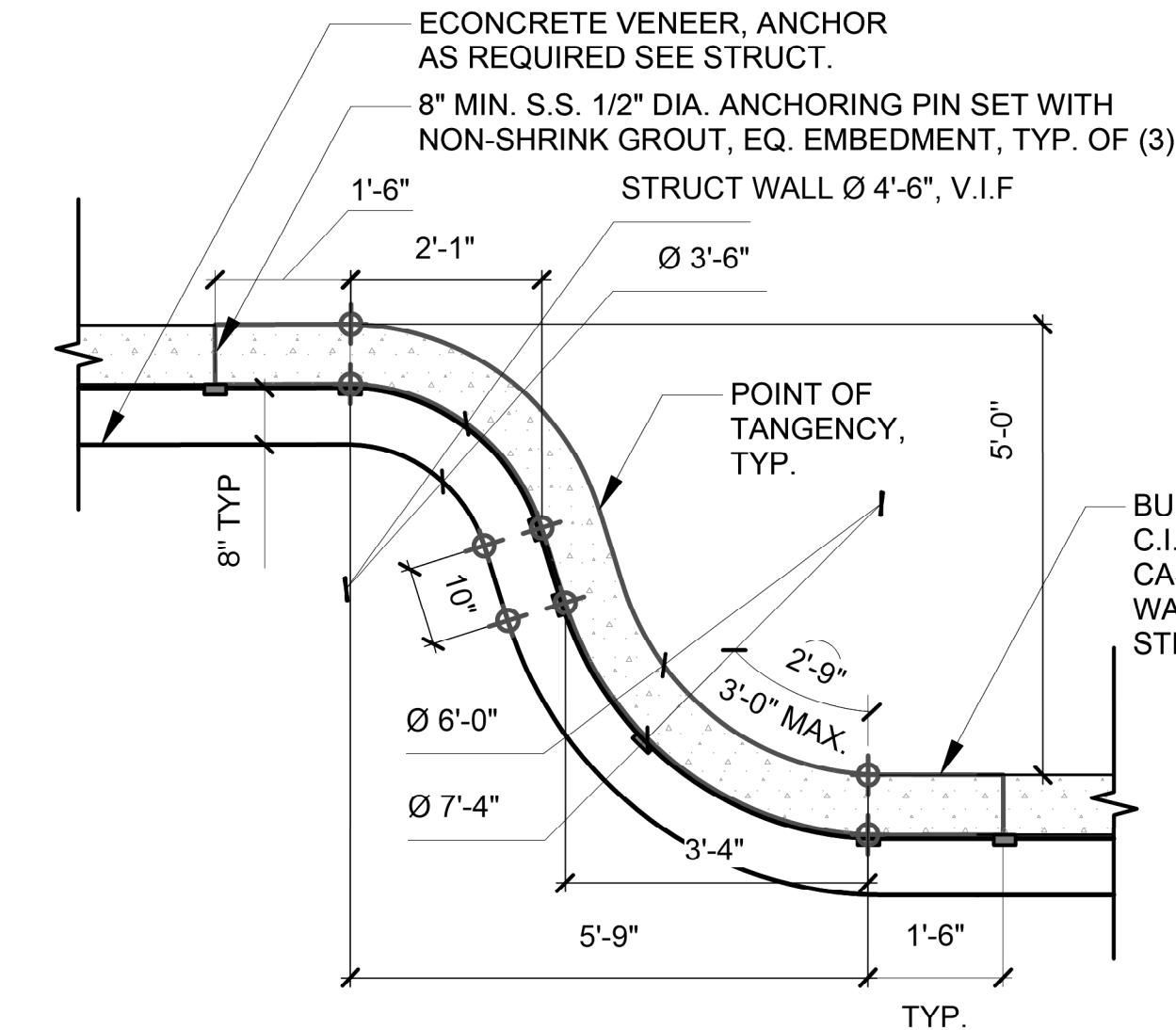
SHEET TITLE

DETAILS - PIER A BULK  
HEAD GUARDRAIL

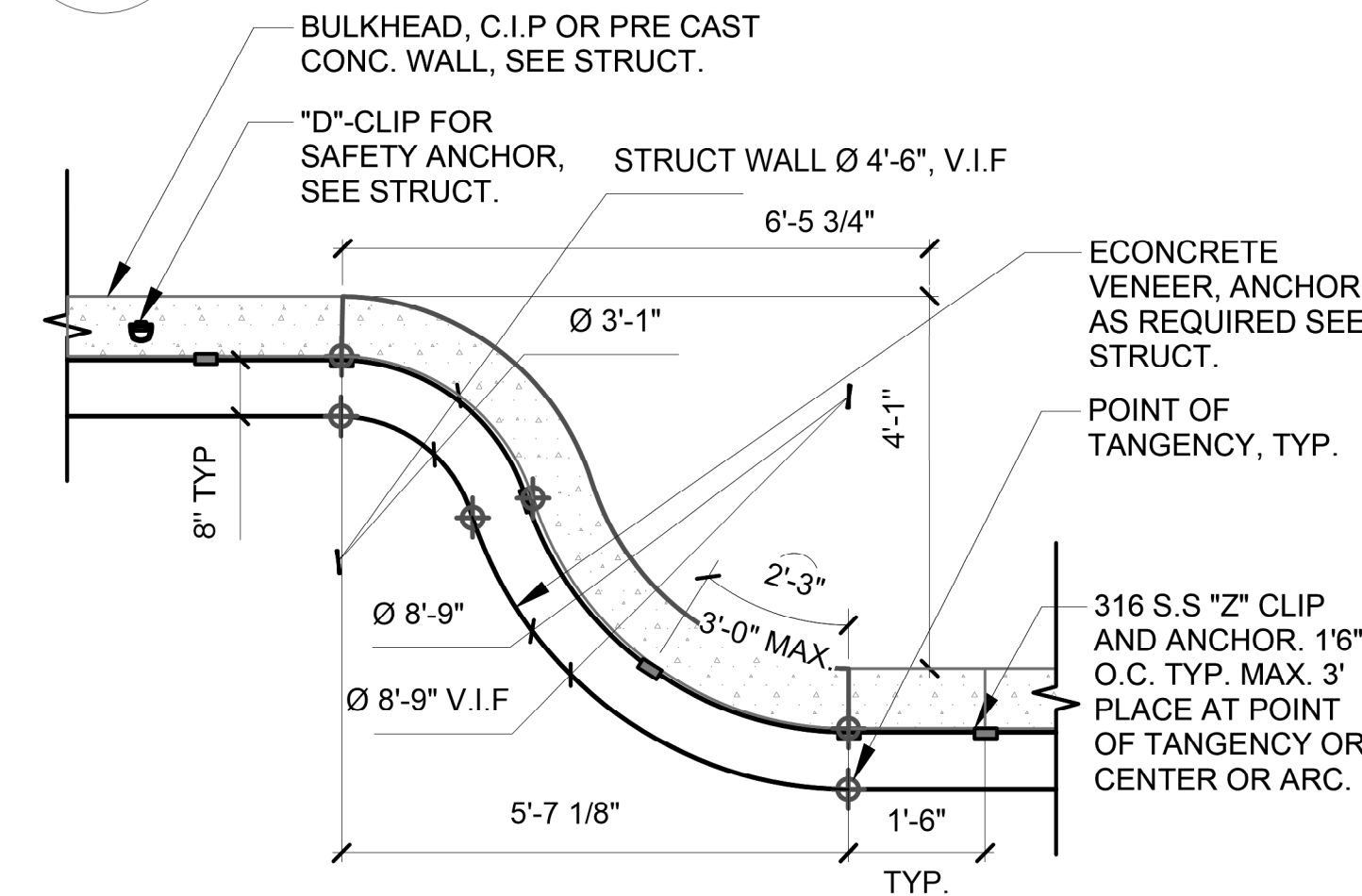
SHEET NUMBER

L-936.00

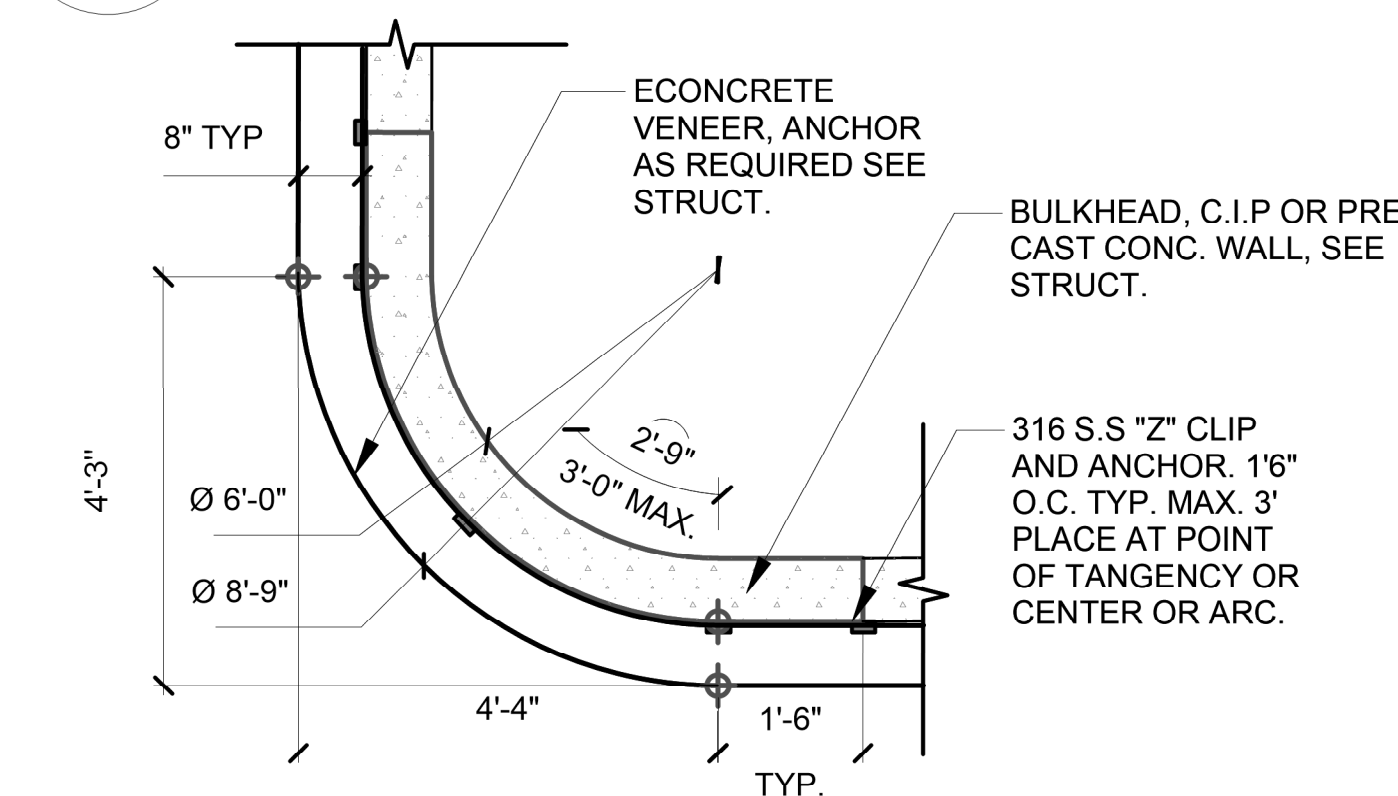




6 PIER A INLET - ECO-CONCRETE "TYPE B" VENEER  
L-945.00 SCALE: 1/2" = 1'-0"



5 PIER A INLET - ECO-CONCRETE "TYPE A" VENEER  
L-945.00 SCALE: 1/2" = 1'-0"



4 PIER A INLET - ECO-CONCRETE VENEER 3'-8" RADIUS  
L-945.00 SCALE: 1/2" = 1'-0"

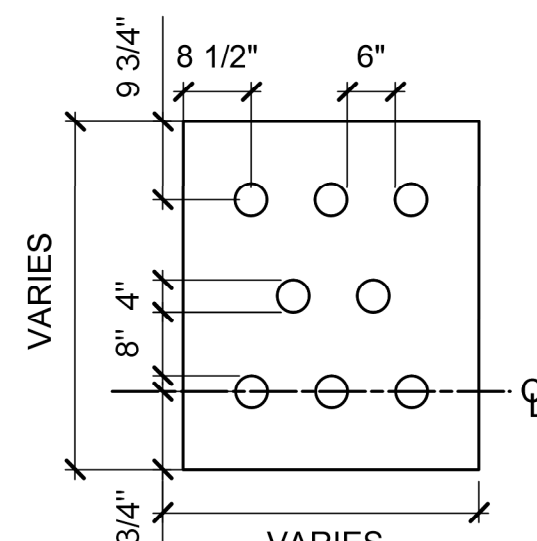
**NOTES:**  
1. INTENT IS FOR PRE-CAST & ENHANCED CONCRETE CLADDING BE ATTACHED TO THE EXISTING OR NEW RELIEVING PLATFORM AN ELEVATION WHERE TIDAL AND WAVE ACTION WILL INUNDATE AND DRAIN. ITEMS PLACED AT THE EXPOSED SLAB BELOW THE METAL WALKWAY.  
2. COORDINATE WITH STRUCT. AS BUILTS AND WITH FABRICATOR'S FOR MOUNTING ANCHORS FOR VENEER CLADDING WITH SIGNED AND SEALED SHOP DRAWINGS FOR APPROVAL.  
3. INTERIOR PATTERN AND ELEVATION TO BE APPROVED PRIOR TO FABRICATION.SEE DETAIL AND CHART FOR DIMENSION AND HEIGHTS.

7 PIER A INLET PLATFORM - ECO-CONCRETE CLADDING ON SLAB  
L-945.00 SCALE: 1/2" = 1'-0"



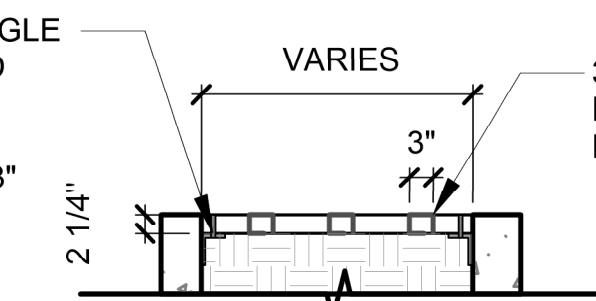
**NOTES:**  
1. IMAGE REPRESENTS ONE OF THE FORM WORK OPTIONS FROM MANUFACTURE. PROVIDE SHOP DRAWING DURING PRE-CAST FABRICATION TO ENSURE MIX ADDITIVES AND SEAMLESS PATTERN ACROSS MULTIPLE PANELS  
2. SEE SPECIFICATIONS

2 PIER A INLET - ECO-CONCRETE VENEER  
L-945.00 SCALE: 1/2" = 1'-0"



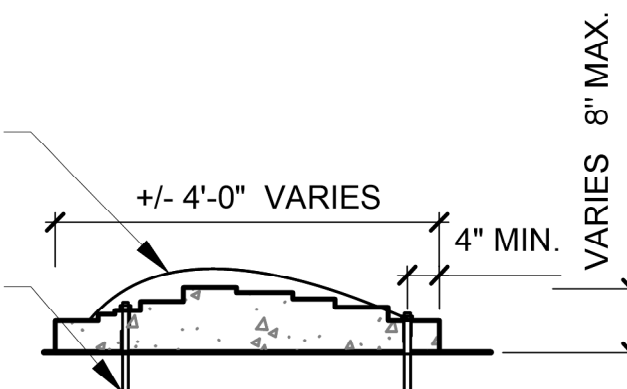
PLAN A

S.S. 4" X 3" "L" ANGLE ANCHORED INTO ECO-CONCRETE BLOCK FOR PRECAST SLAB 3" S.S. 1/2" DIA. CONNECTION BOLTS,

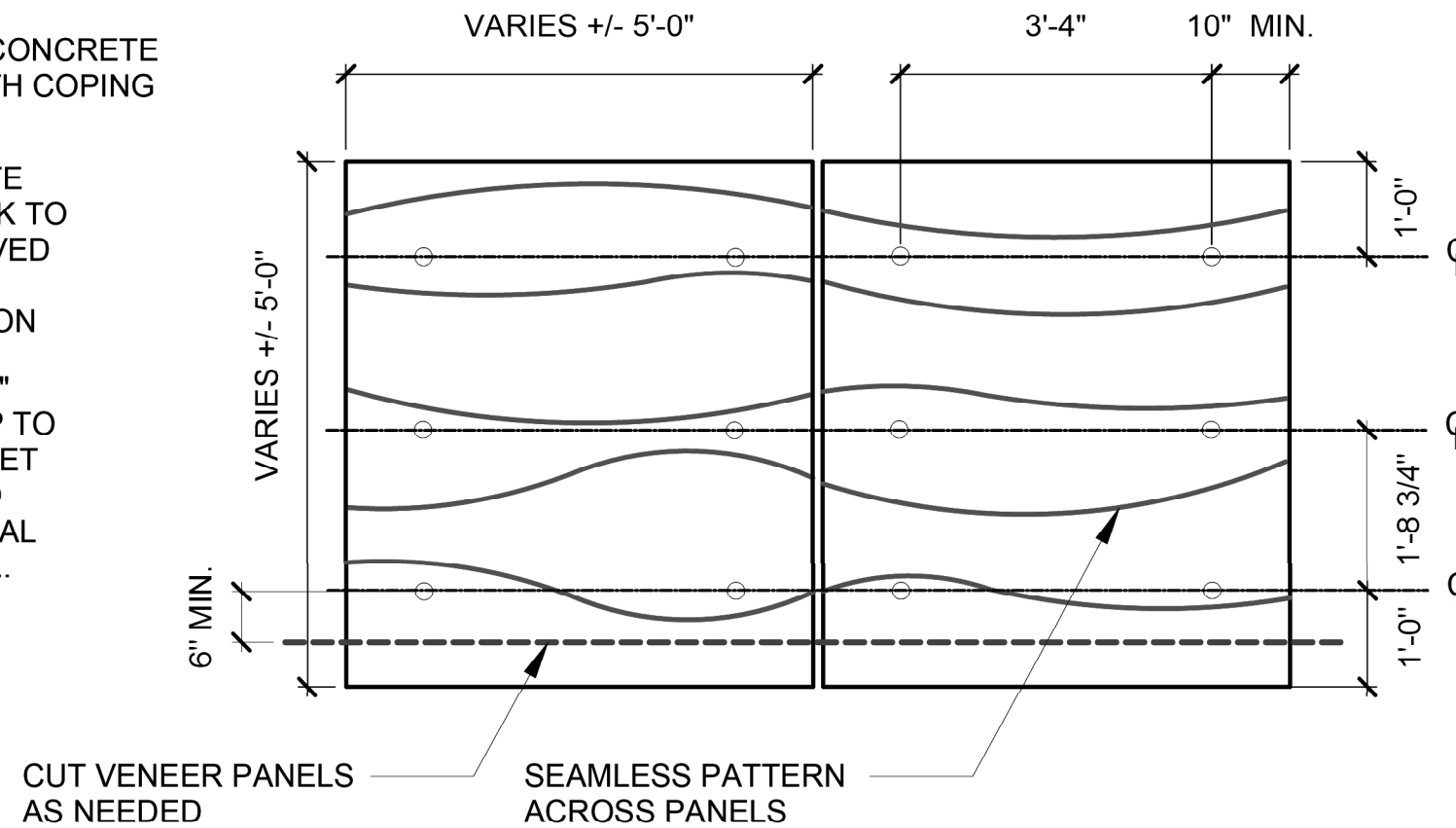
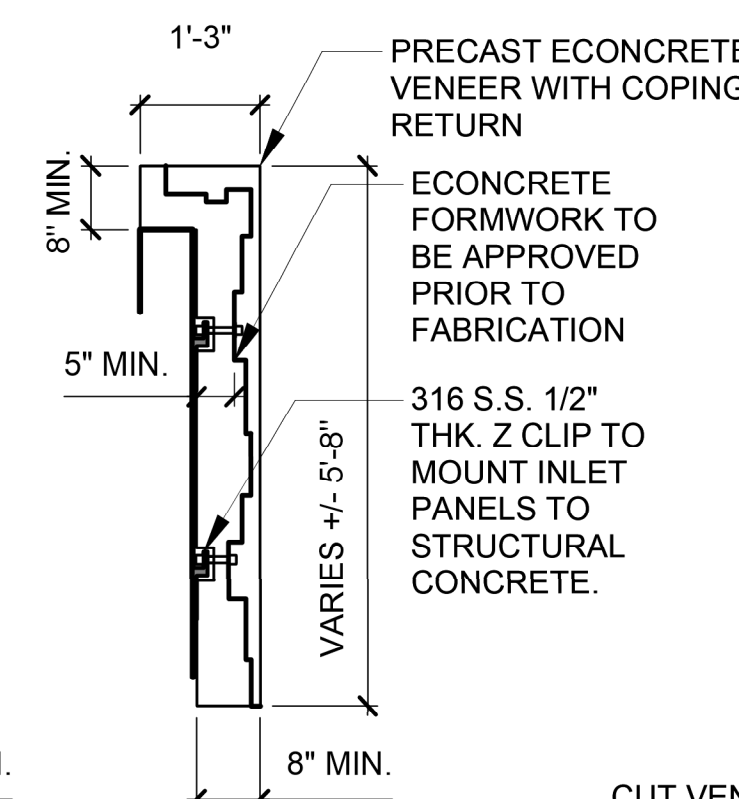
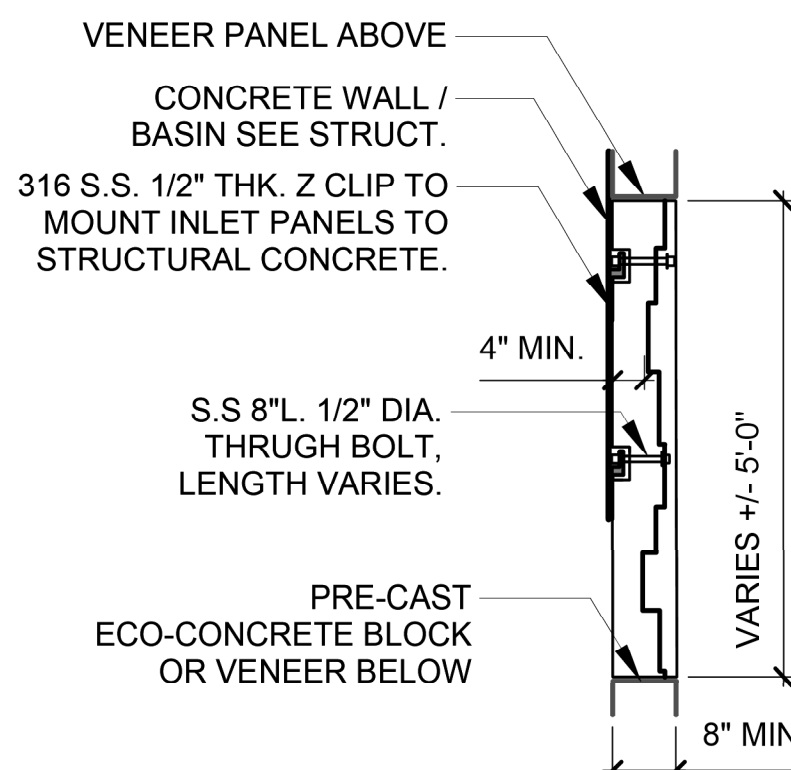


1 PIER A INLET - ECO-CONCRETE BLOCK  
L-945.00 SCALE: 1/2" = 1'-0"

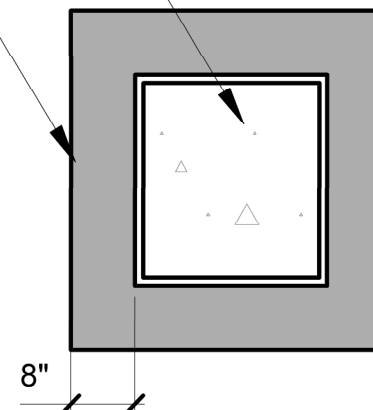
ELEVATION VARIES PER MOLD  
316 S.S. 1/2" DIA. 8" MIN. EQ EMBEDMENT IN NON-SHRINK GROUT ANCHORING PINS AS REQUIRED FOR INLET BLOCKS TO STRUCT. CONCRETE SLAB



**NOTES:**  
1. INTENT IS FOR PRE CAST VENEER AND COPING PIECES TO BE ATTACHED TO PRECAST CONCRETE, SEE STRUCT. DRAWINGS. FORMWORK AND ADD MIXTURES CAN BE PROVIDED BY FABRICATOR FOR INTERGRATED SOLUTION OF VENEER AND STRUCT. WALL, COORDINATE STAMPED AND SEALED SHOP DRAWINGS PRIOR TO INSTALLATION  
2. INTERIOR PATTERN TO BE APPROVED PRIOR TO FABRICATION. DESIGN INTENT IS TO HAVE A SEAMLESS PATTERN ACROSS MULTIPLE PANELS. PANELS ARE SHOW AS A CONSISTANT MODULAR FOR ESTIMATING PURPOSES, PANELS SIZE MAY VARIE TO CREATE EQUAL SEGMENTS AS NEEDED.  
3. VENEER OR C.I.P CLADDING TO COVER THE RELIEVING PLATFORM SLAB (NEW OR EXISTING), STRUCTURAL BENTS AND ENCASE ALL SUPPORTING PILES. VENEER TO EXTEND AT MIN. TO THE MEAN LOW WATER LEVEL. COORDINATE WITH STRUCT. DRAWING AND CIVIL DRAWINGS AS REQUIRED FOR CRITICAL ELEVATION. COORDINATE WITH STRUCT AS REQUIRED FOR MOUNTING/ ANCHORING. SEE NOTE 1.  
4. BOLT LOCATIONS TO BE ALIGNED ACROSS MULTIPLE PANELS AS NEEDED. TYP. ANCHOR TO BE S.S. 8" MIN. 1/2" DIA. 'I' BOLT W. EQ. EMBEDMENT IN BULKHEAD OR CONC. WALL.  
5. PROVIDE PUSH LOCK, "D" CLIPS OR EQUALFOR SAFETY ANCHORS. TYP. 12'-0" O.C. SPACING, AND MEET ALL OSHA REQUIREMENTS.  
6. COORDINATE WITH STAMPED AND SEALED SHOP DRAWINGS AS REQUIRED AND SUBMIT FOR APPROVAL FROM LA AND ENGINEER FOR ALL ITEMS

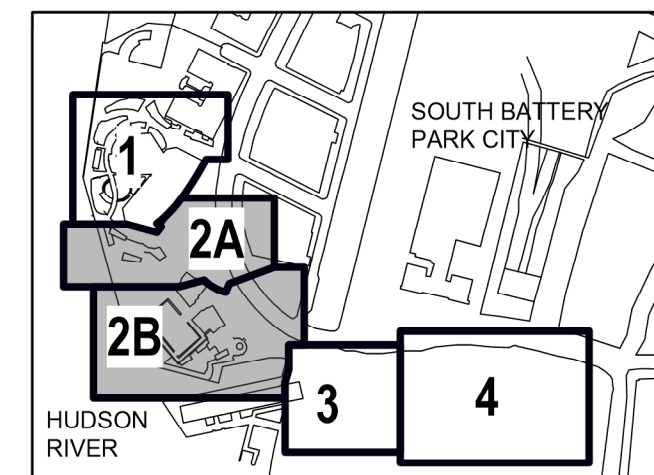


NEW OR EXISTING RELIEVING PLATFORM PILE, SEE STRUCT. DRAWINGS FOR ATTACHEMENTS AND REINFORCEMENT  
ECO-CONCRETE PILE CASING SIZE VARIES, V.I.F.



**NOTES:**  
1. SEE STRUCT. DRAWINGS FOR EXISTING AND NEW PILE SUPPORTS FOR THE RELIEVING PLATFORM AND METAL WALKWAY. PROVIDE STAMPED AND SEALED SHOP DRAWINGS FOR FORM WORK DESIGN AND ANCHOR / ATTACHEMENTS.

3 PIER A INLET - ECO-CONCRETE PILE CASING  
L-945.00 SCALE: 1/2" = 1'-0"



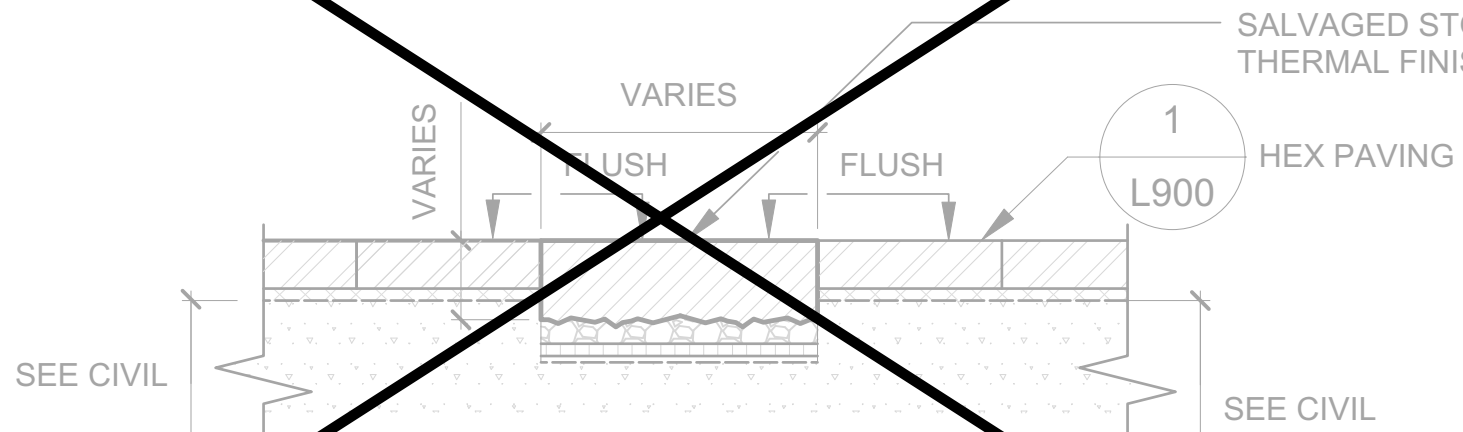
NO.	DATE	DESCRIPTION
1	2023-01-25	ADDENDUM REVISION 1
I/R	2022-11-11	BID SET
I/R	DATE	DESCRIPTION



ANSI D 22" x 34"

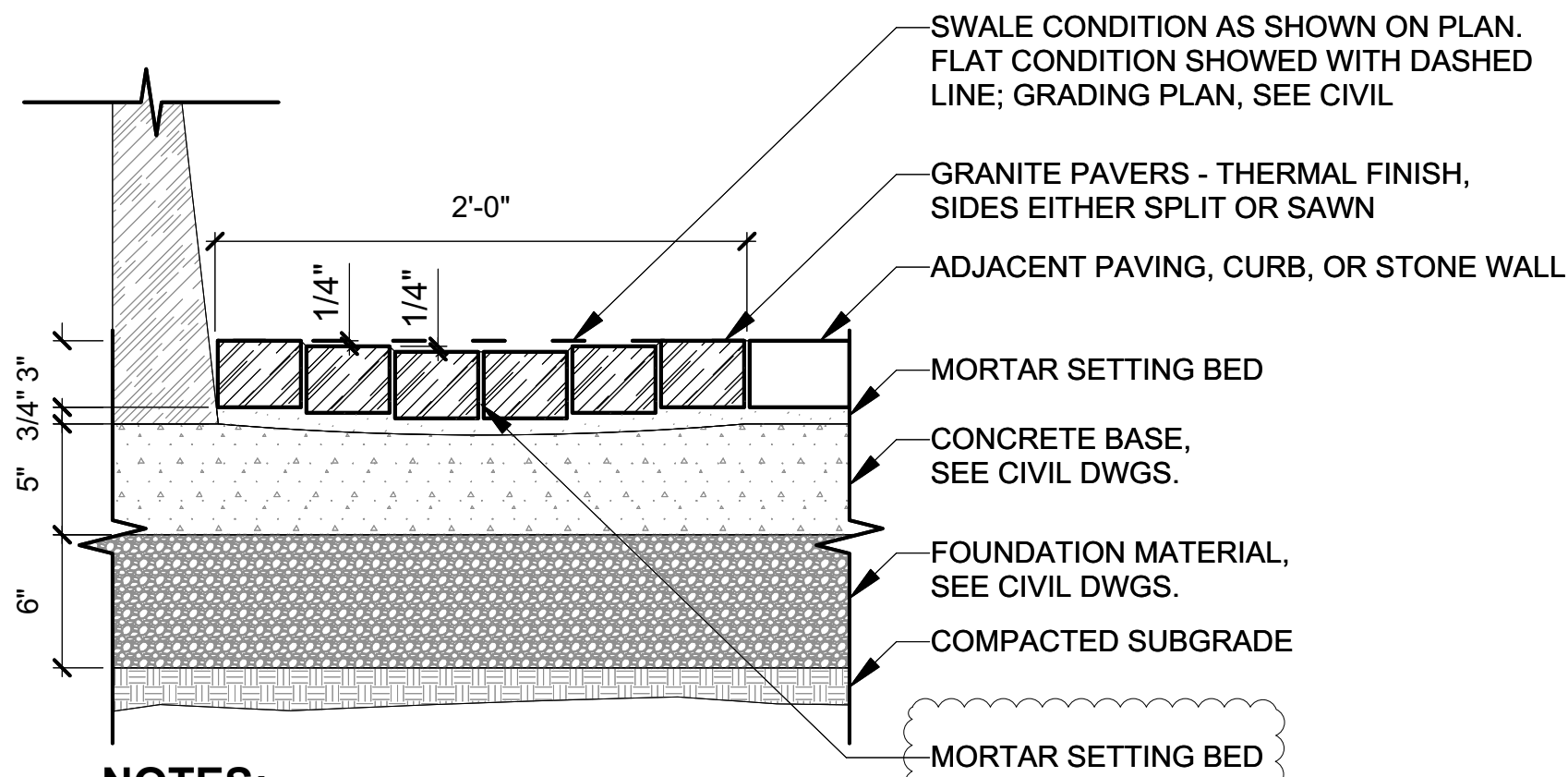
**NOTES:**

1. CONTRACTOR TO PROVIDE SALVAGE INVENTORY, PROVIDE SHOP DRAWINGS FOR APPROVAL PRIOR TO INSTLLATION.



NIC

**8 SALVAGED STONE FLUSH WITH PAVEMENT**  
SCALE: 1" = 1'-0"



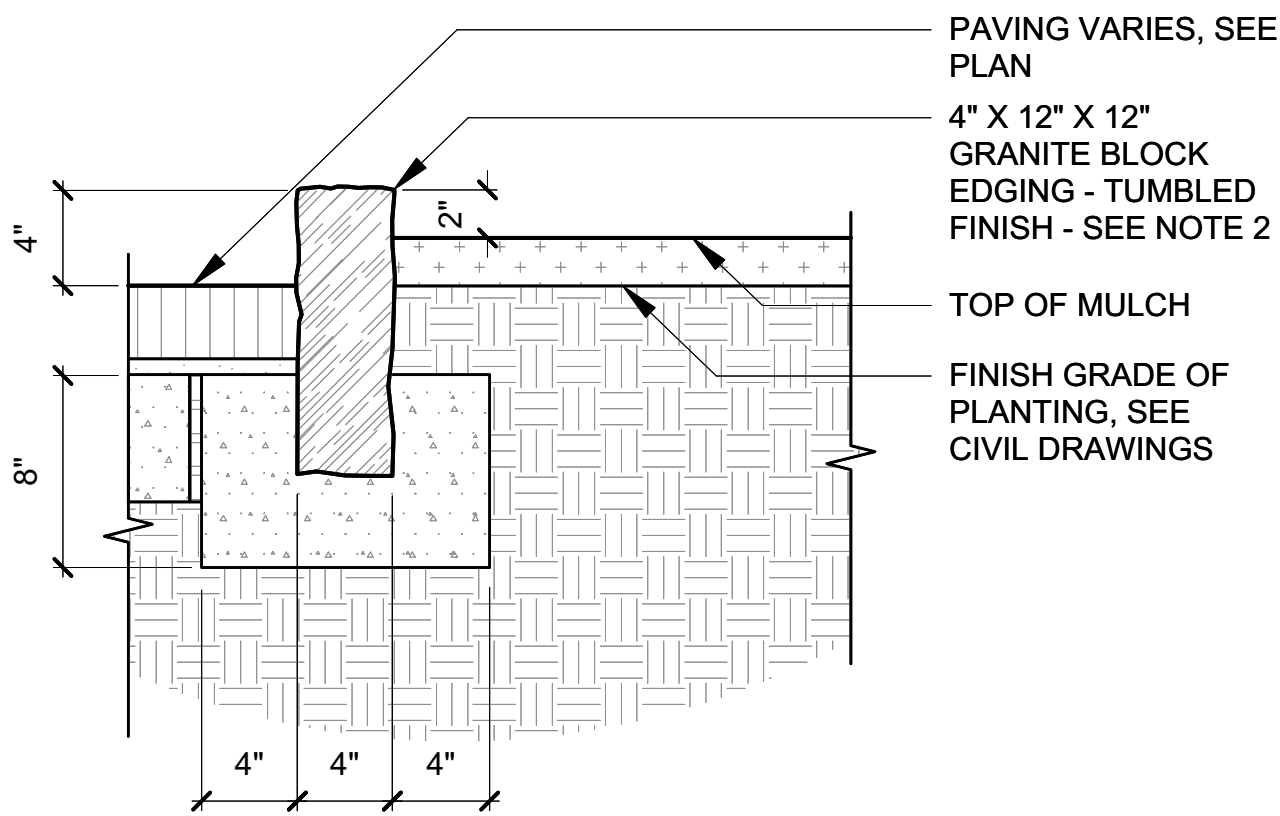
**NOTES:**

1. PITCH TO DRAIN

**8 GRANITE PAVER SWALE ON CONCRETE BASE**  
SCALE: 1 1/2" = 1'-0"

**NOTES:**

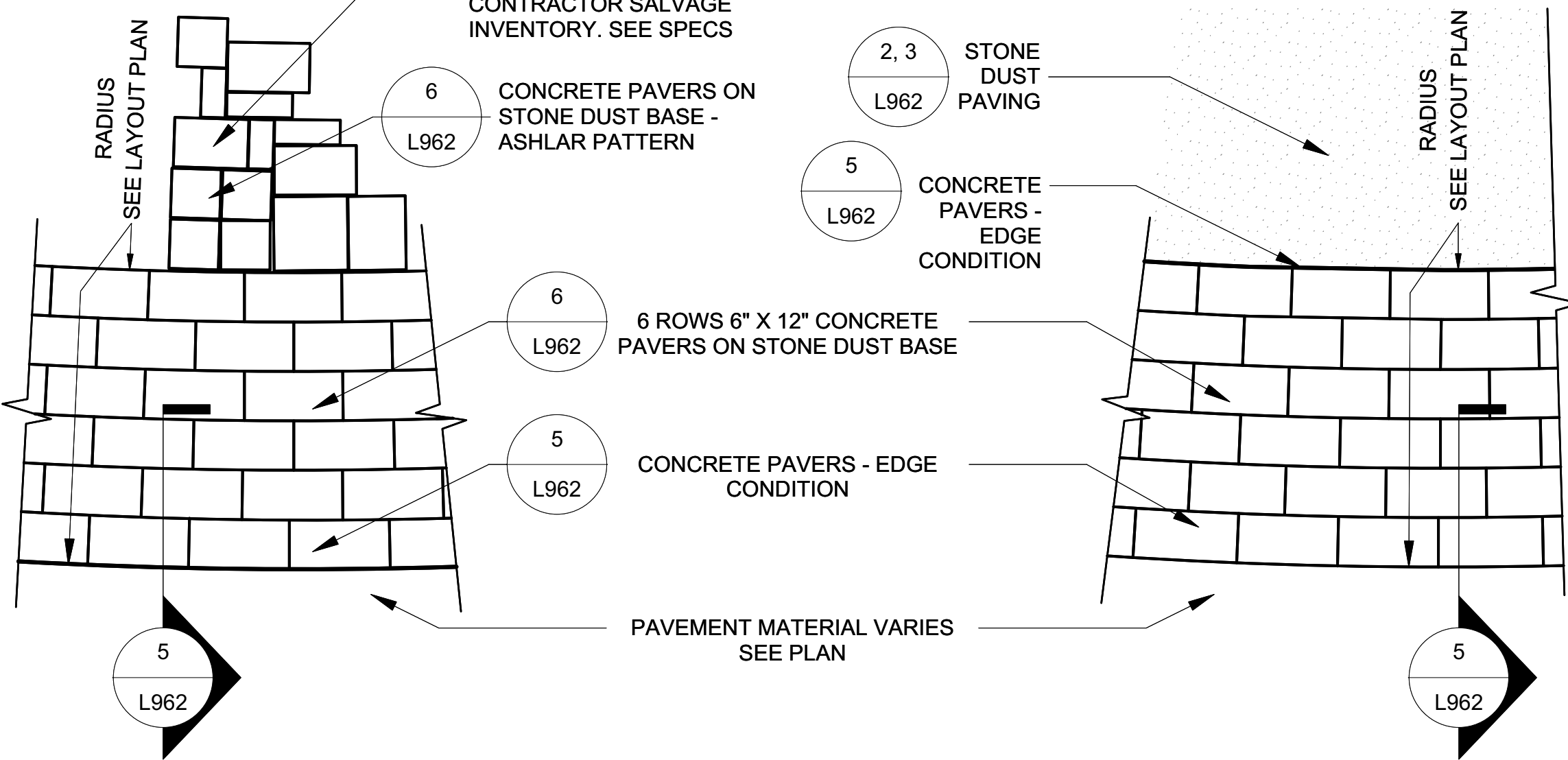
1. WHERE TREE ROOTS ARE ENCOUNTERED ADJUST CONCRETE CRADLE AND NOTCH GRANITE BLOCK EDGING ACCORDINGLY.  
2. TUMBLED GRANITE BLOCK FABRICATED FROM CANADIAN CHARCOAL GRANITE.



SOURCE: STANDARD NYC DPR #12 ON SHEET 18  
SOLDIER GRANITE BLOCK LANDSCAPE EDGING

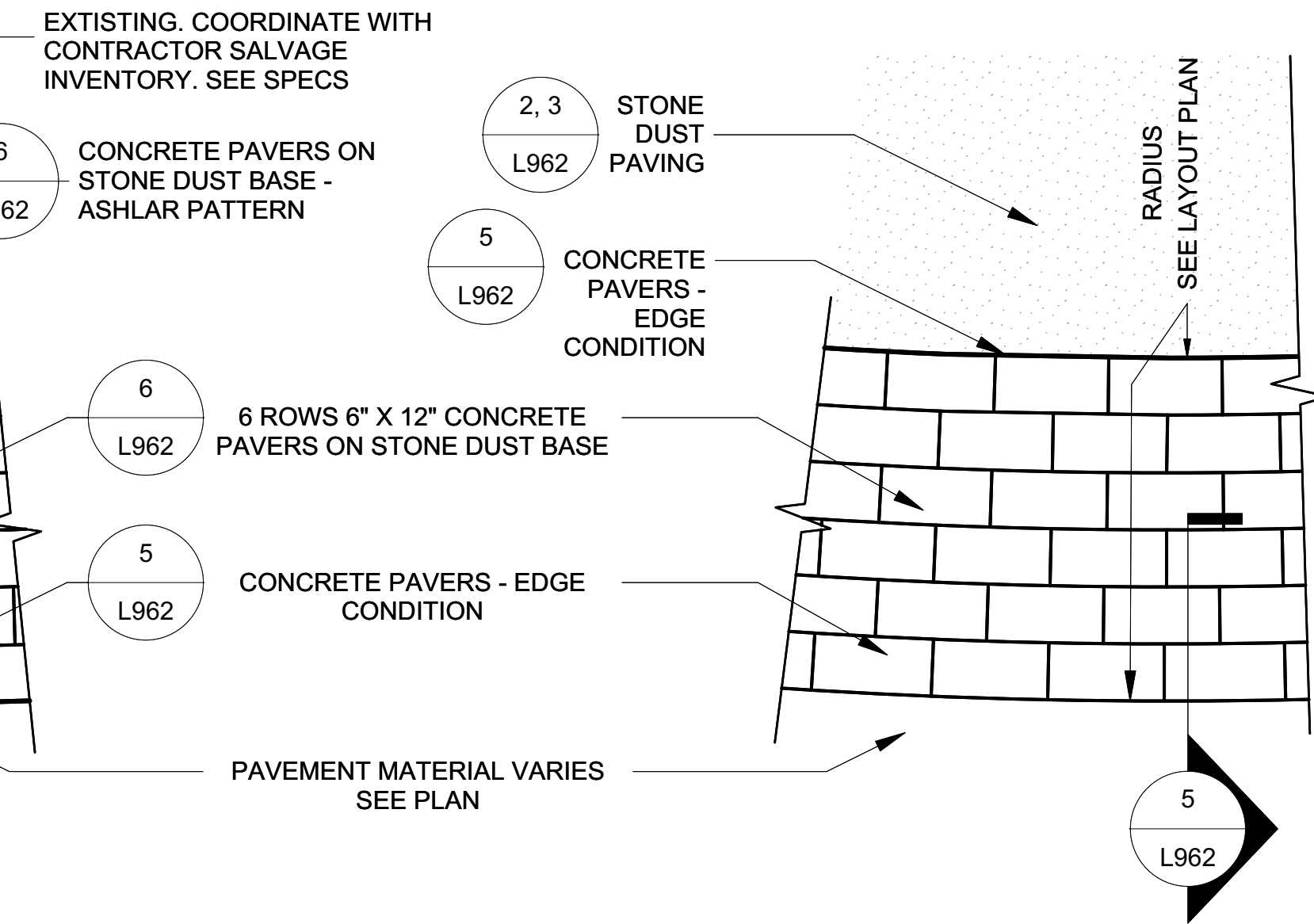
**7 GRANITE BLOCK EDGING AT PLANTING**  
SCALE: 1 1/2" = 1'-0"

EXISTING. COORDINATE WITH CONTRACTOR SALVAGE INVENTORY. SEE SPECS



**4 CONCRETE PAVERS ON STONE DUST BASE - PLAN VIEW**  
SCALE: 3/4" = 1'-0"

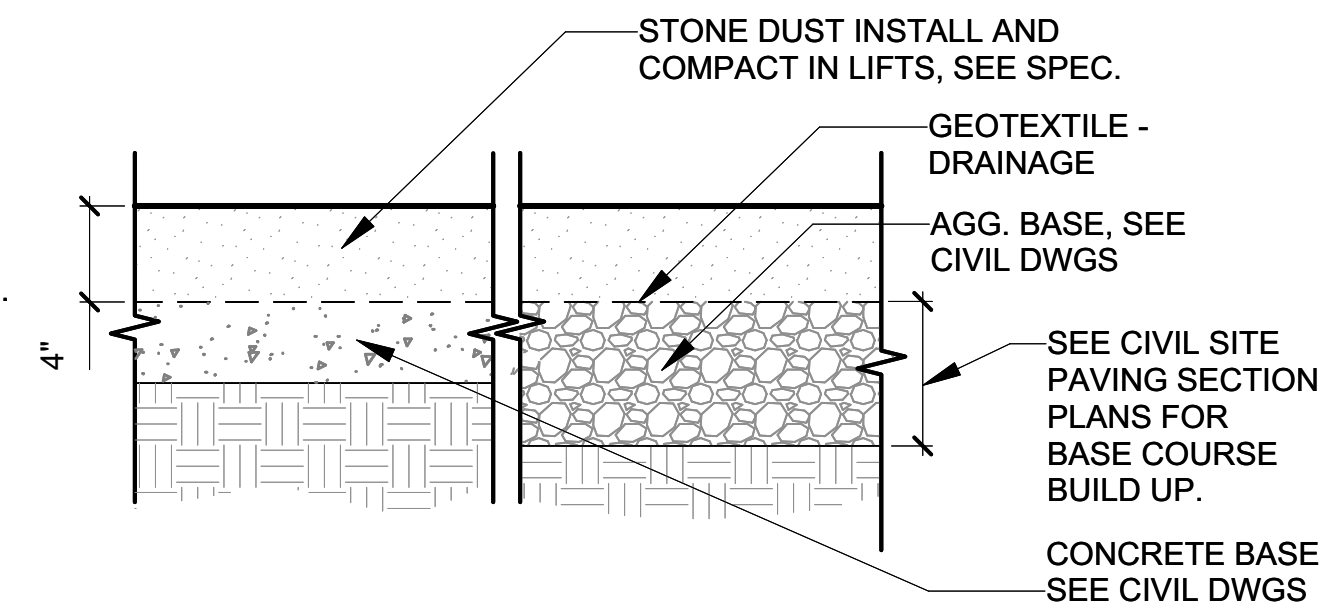
**5 CONCRETE PAVERS - EDGE CONDITION**  
SCALE: 3" = 1'-0"



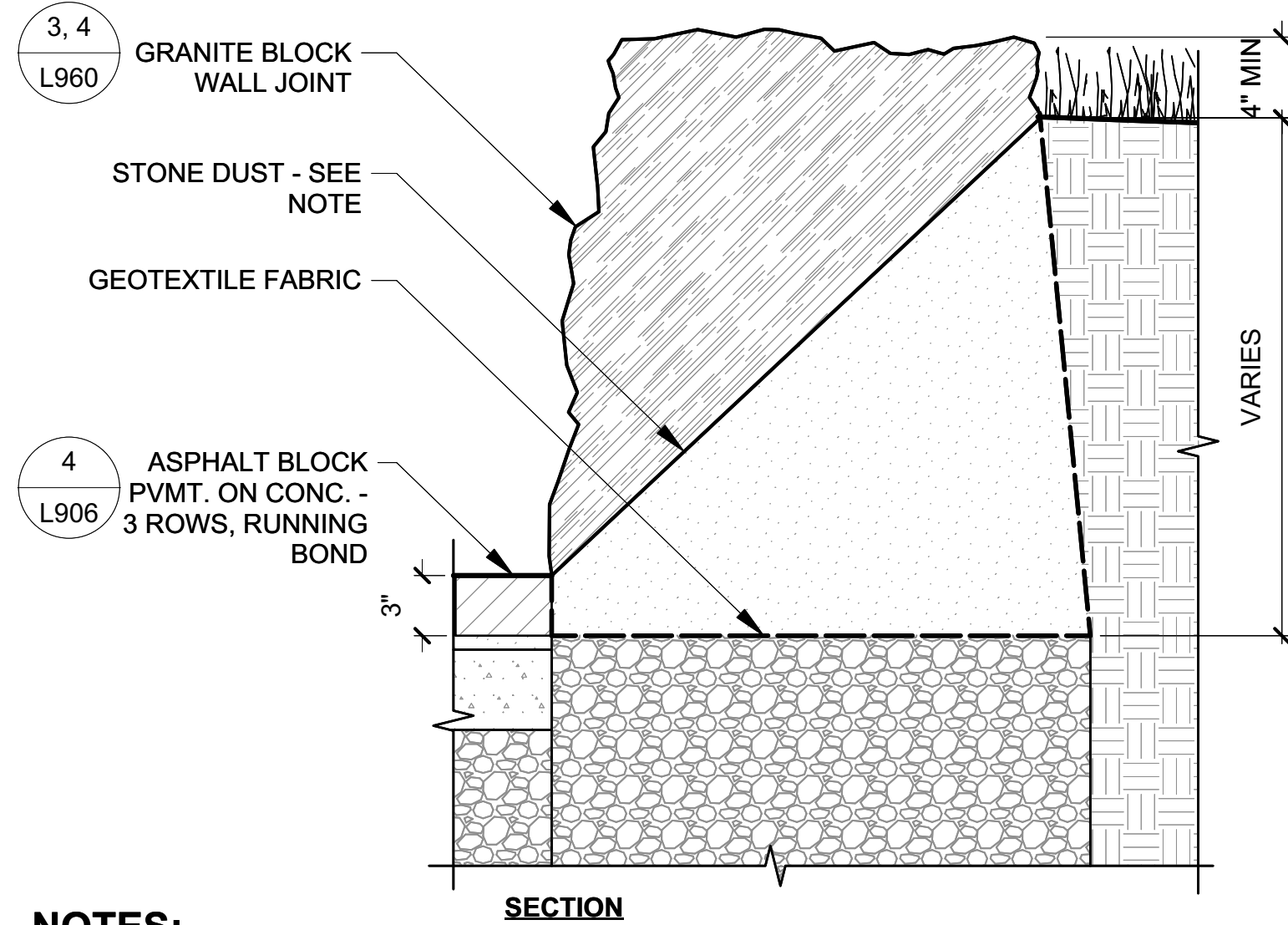
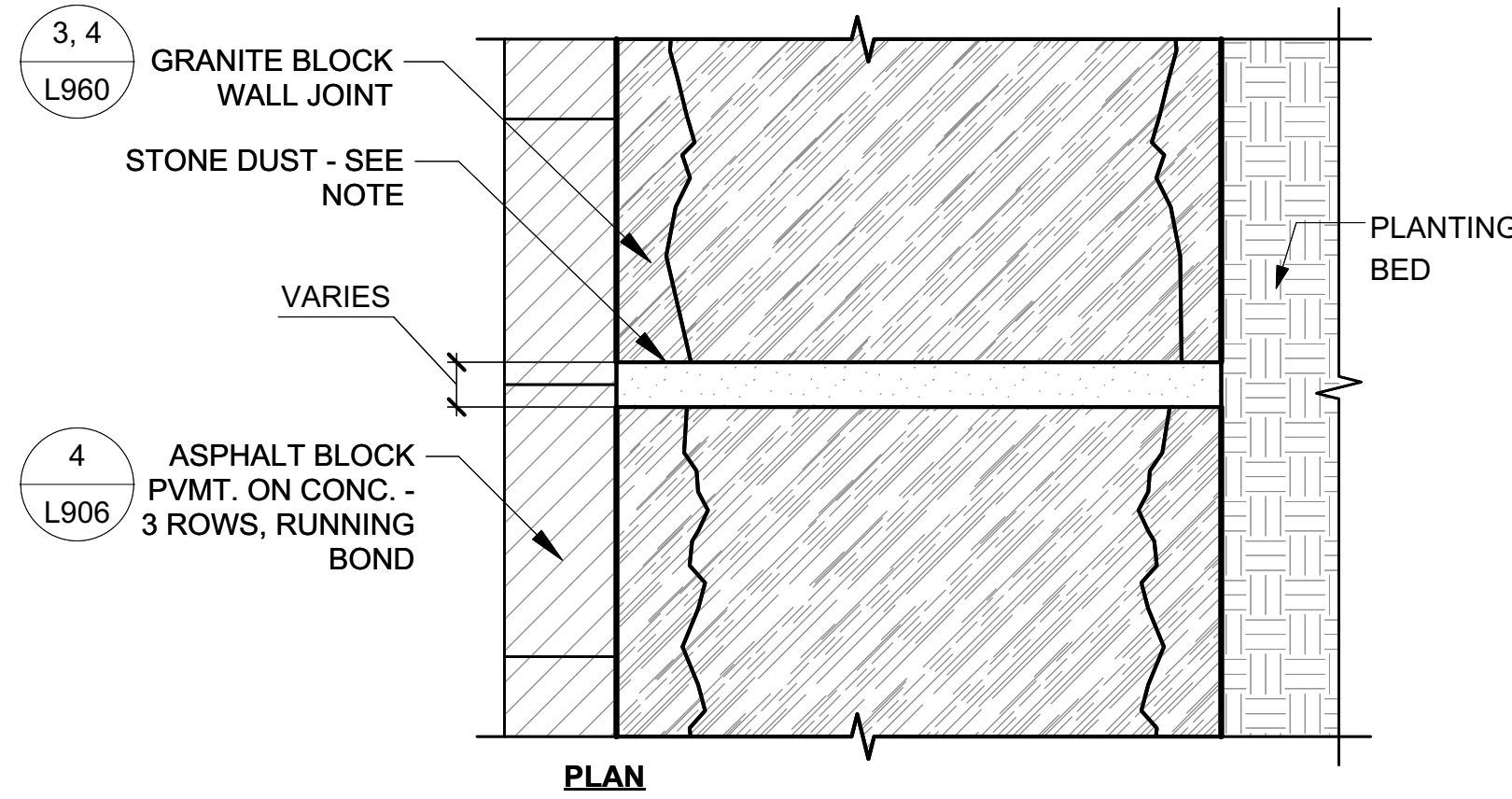
**NOTES:**

1. SEE CIVIL DRAWINGS FOR BASE COURSE.  
2. SEE SPECIFICATIONS.

**3 STONE DUST FOR MAJOR PATHS**  
SCALE: 1 1/2" = 1'-0"



**2 STONE DUST**  
SCALE: 1 1/2" = 1'-0"



**NOTES:**

1. STONE DUST AT WALL JOINTS SHALL BE MIX OF 1 PART PORTLAND CEMENT AND 4 PARTS STONE DUST, TAMPED INTO PLACE  
2. INFILL EXISTING / SALVAGE TO REMAIN STONE WALL JOINTS WITH STONE DUST, MORTAR MIXTURE, AND GEOTEXTILE FABRIC AS NEEDED TO RETAIN GRADE. BURY GEOTEXTILE FABRIC 1'-0" MIN. IF NOT WRAPPED BELOW GRANITE WALL.

**1 STONE DUST AT GRANITE BLOCK WALL JOINT**  
SCALE: 1 1/2" = 1'-0"

**AECOM**

**PROJECT**

**SOUTH BATTERY PARK CITY  
RESILIENCY DESIGN  
SERVICES**

**CLIENT**

**HUGH L. CAREY  
BATTERY PARK CITY AUTHORITY**

**CONSULTANT**

**AECOM**

AECOM USA  
605 3rd Ave, 2nd Floor, New York, NY 10158  
212.973.2900 tel www.aecom.com

**SUB-CONSULTANT**

MAGNUSON KLEMENCIC ASSOCIATES  
1301 Fifth Avenue, Suite 3200, Seattle, WA 98101-2699  
206.292.1200 tel 206.292.1201 fax www.mka.com

SITE WORKS  
150 West 28th St., Suite 605  
New York, NY 10001 212.255.8350 siteworkscm.com

MILHOUSE  
333 South Wabash Ave, Suite 2901,  
Chicago, IL 60604 313.987.0061 milhouseinc.com

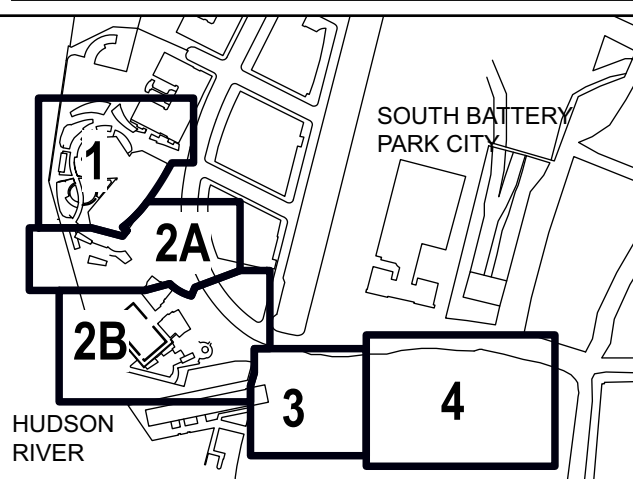
TILLOTSON DESIGN ASSOCIATES  
40 North St, Rm 705, New York, NY 10013  
212.675.7760 tilotsondesign.com

THOMAS PHIFER AND PARTNERS  
180 Varick St, New York, NY 10014  
212.337.0334 thomasphifer.com

NAIK CONSULTING GROUP, PC  
111 West 33rd St., Suite 605 New York, NY 10120  
212.576.2701 naikgroup.com

OWEIS  
100 East Hanover Ave., Suite 101, Cedar Knolls, NJ 07927  
973.539.440 oweisengineering.com

**KEY PLAN**



**REGISTRATION**



**NYC SBS JOB NUMBER**

**20220059**

**ISSUE/REVISION**

I/R	DATE	DESCRIPTION
1	2023-01-25	ADDENDUM REVISION 1
I	2022-11-11	BID SET
I/R	DATE	DESCRIPTION

**PROJECT/TERM CONTRACT NUMBER**

Contract No. 18-2586

**SHEET TITLE**

**DETAILS - BATTERY  
PAVING**

**SHEET NUMBER**

**L-962.00**

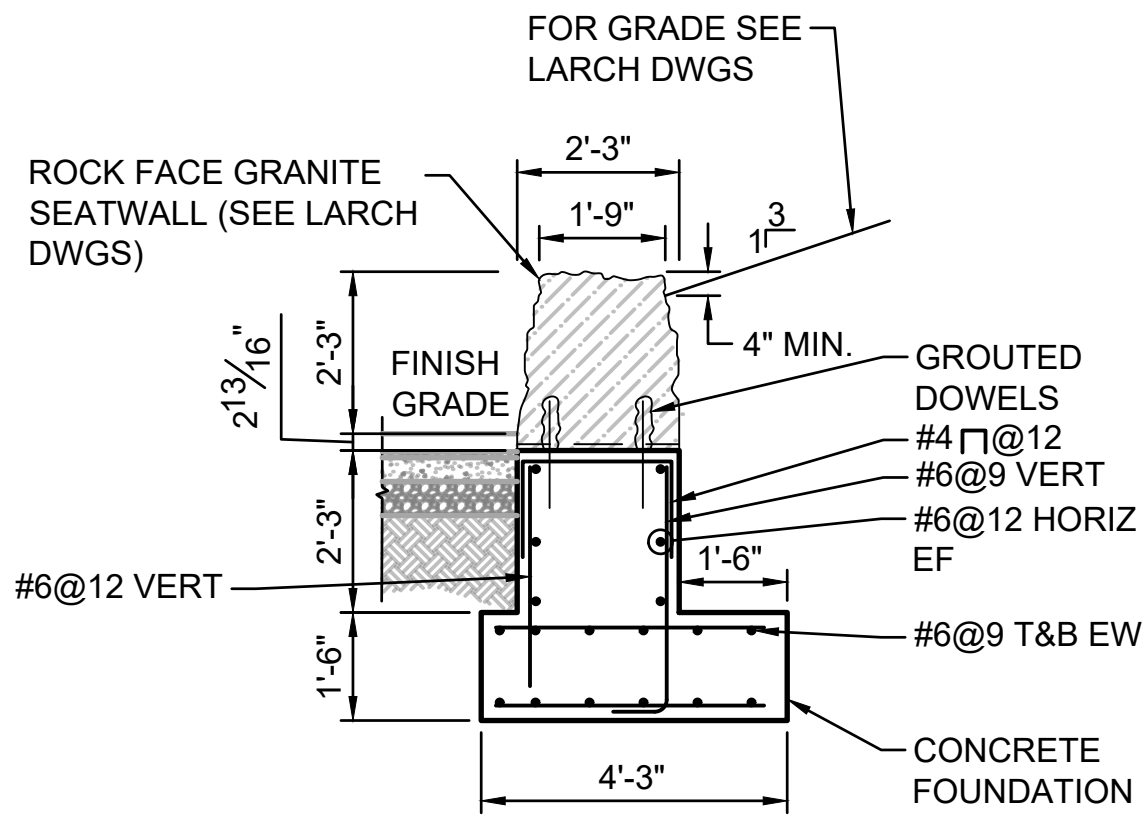
PAGE NUMBER OF

**ATTACHMENT #2**  
**REVISED STRUCTURAL DRAWING**  
***SS405: Site Structure Sections – Battery***

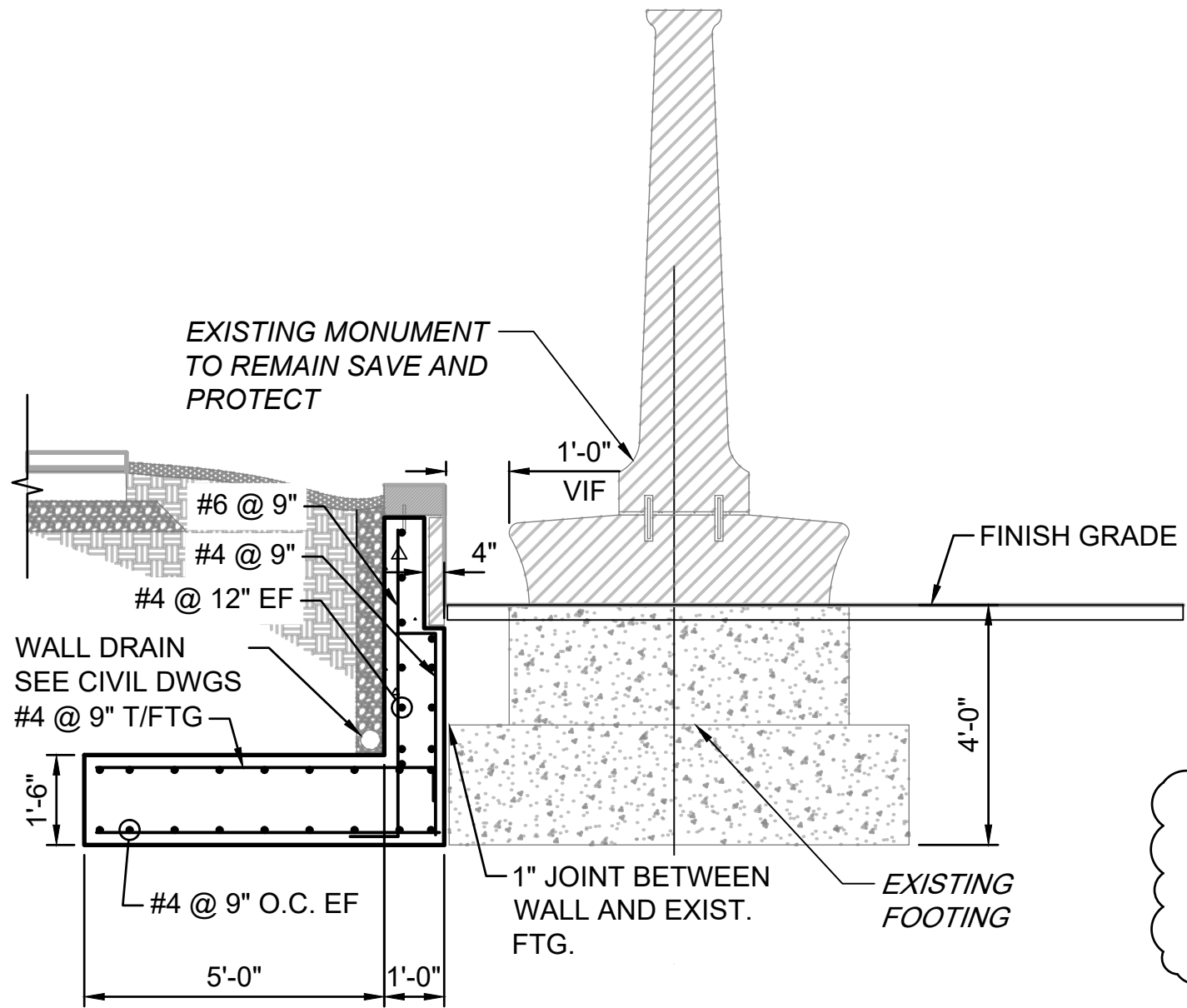
*(ATTACHED)*



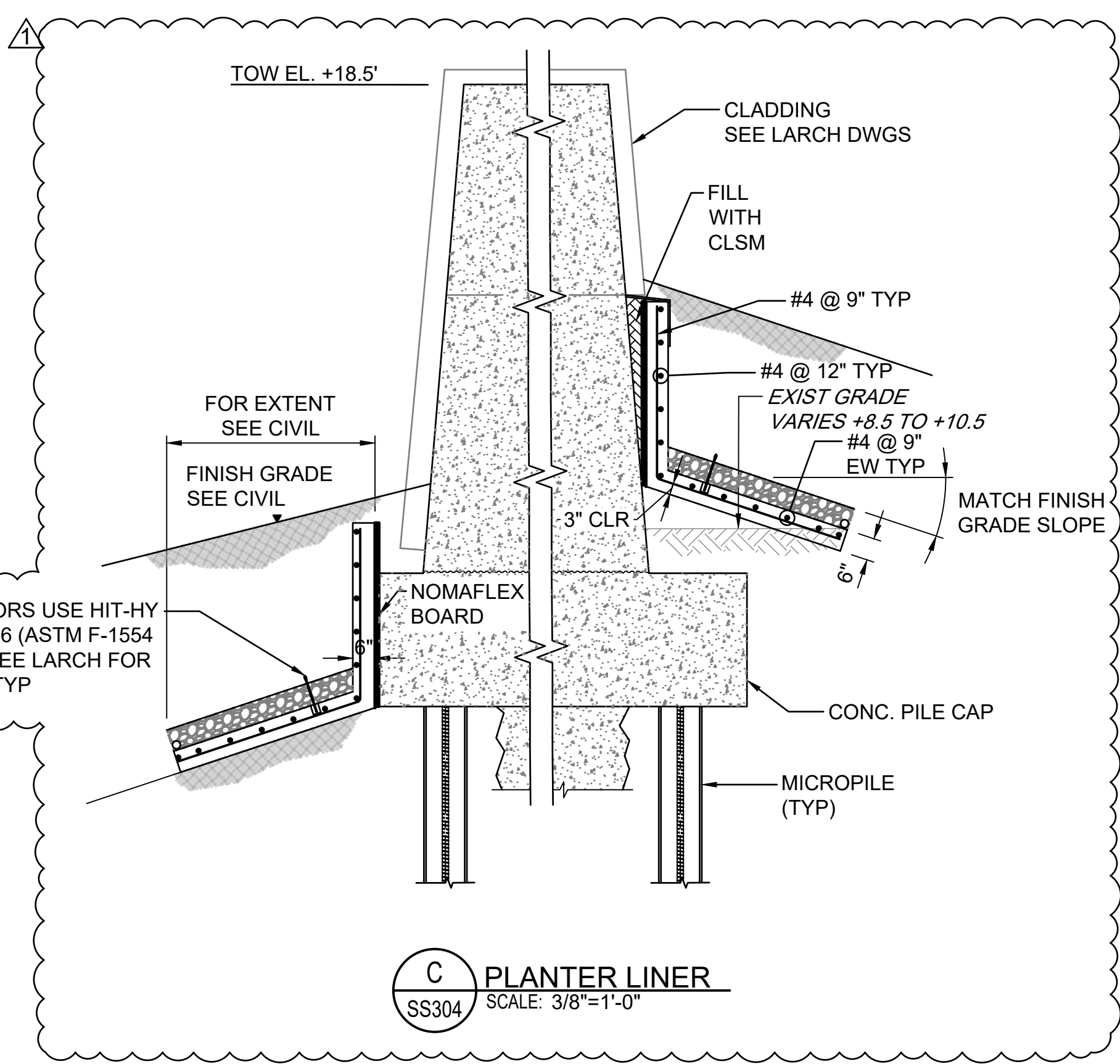
ANSI D 22' x 34'



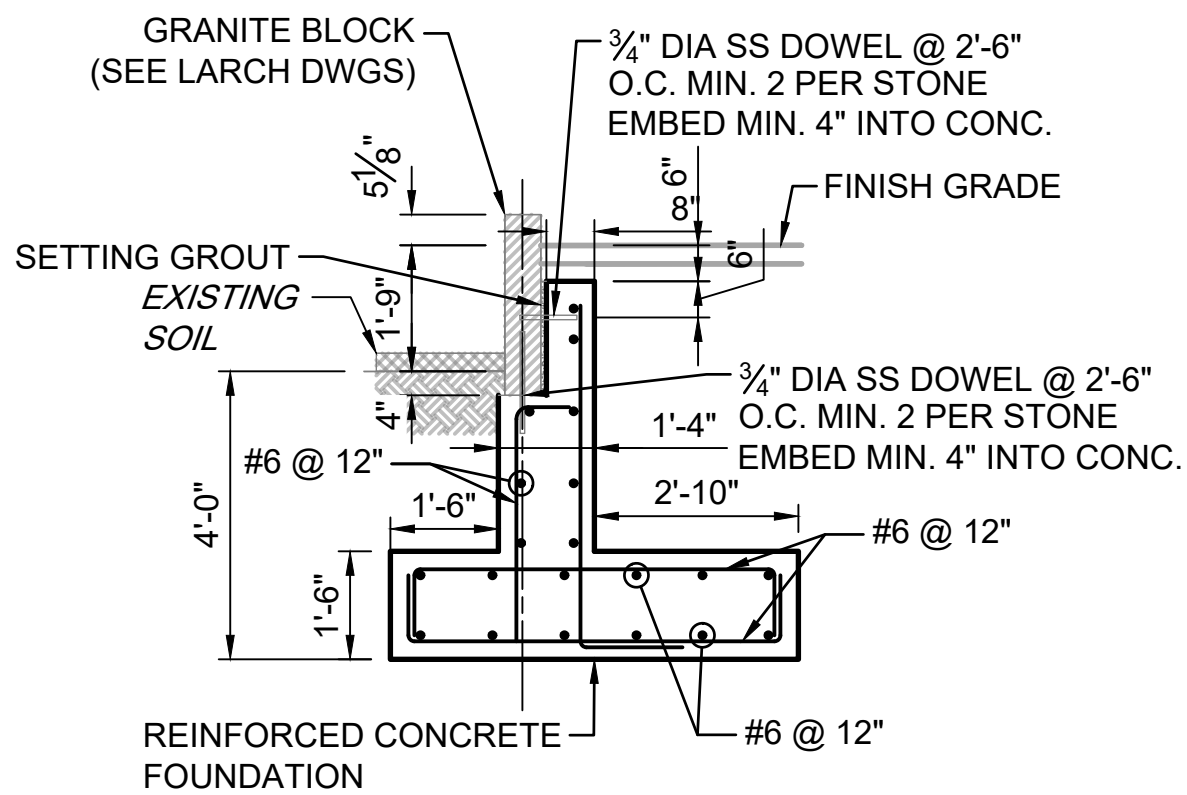
**A** GRANITE PERIMETER SEATWALL - RETAINING  
SCALE: 3/8"=1'-0"  
SS304  
SS305



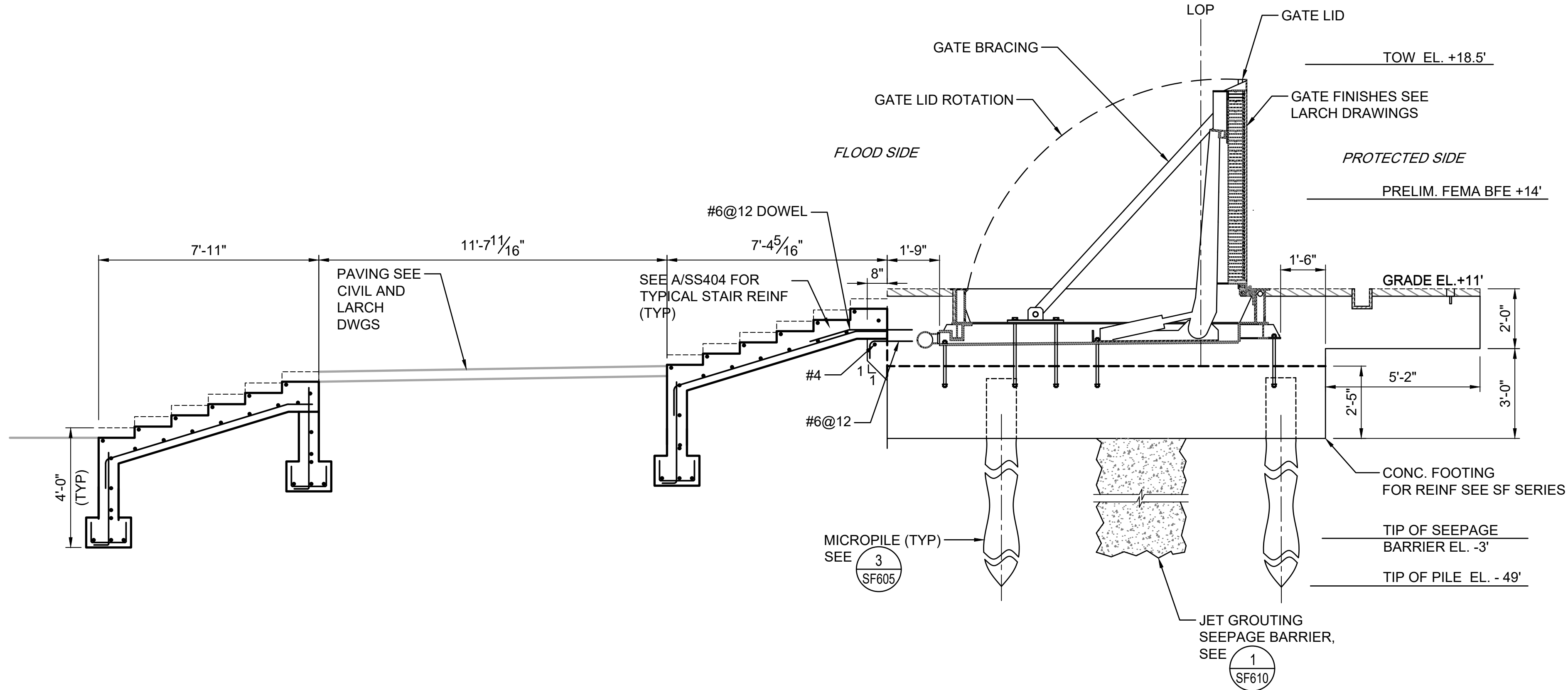
**B** WALLOON SETTLER MONUMENT SECTION  
SCALE: 3/8"=1'-0"  
SS304



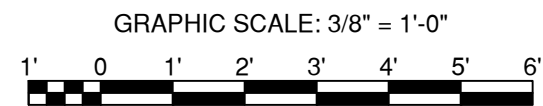
**C** PLANTER LINER  
SCALE: 3/8"=1'-0"  
SS304



**D** BP STAIR GRANITE CURB CHEEK WALL  
SCALE: 3/8" = 1'-0"  
SS405



**E** STAIRS AND FLIP UP GATE SECTION  
SCALE: 3/8"=1'-0"  
SS304



**AECOM**

**PROJECT**  
SOUTH BATTERY PARK CITY  
RESILIENCY DESIGN SERVICES  
20 Battery Place  
New York, NY 10280

**CLIENT**  
HUGH L. CAREY BATTERY  
PARK CITY AUTHORITY  
200 Liberty St, 24th Floor, New York, NY 10281  
212.417.4304

**CONSULTANT**  
**AECOM**  
AECOM USA  
605 3rd Ave, 2nd Floor, New York, NY 10158  
212.973.2900 www.aecom.com

**SUB-CONSULTANT**  
MAGNUSON KLEMENCIC ASSOCIATES  
1301 Fifth Avenue, Suite 3200, Seattle, WA 98101-2699  
206.292.1200 tel 206.292.1201 fax www.mka.com

**SITEWORKS**  
150 West 28th St, Suite 605, New York, NY 10001  
212.256.6350 siteworkscm.com

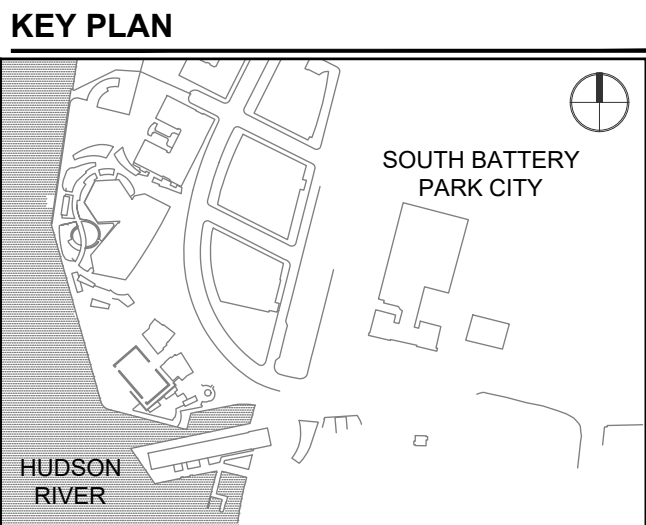
**MILHOUSE**  
333 South Wabash Ave, Suite 2901, Chicago, IL 60604  
313.987.0061 milhouseinc.com

**TILLOTSON DESIGN ASSOCIATES**  
40 Worth St, Rm 703, New York, NY 10013  
212.675.7760 tilloftsondesign.com

**THOMAS PHIFER AND PARTNERS**  
180 Varick St., New York, NY 10014  
212.337.0334 thomasphifer.com

**NAIK CONSULTING GROUP, PC**  
111 West 33rd St., Suite 605 New York, NY 10120  
212.575.2701 naikgroup.com

**OWEIS**  
100 East Hanover Ave., Suite 101, Cedar Knolls, NJ 07927  
973.539.440 oweisengineering.com



**REGISTRATION**



**NYC SBS JOB NUMBER**

20220059

**ISSUE/REVISION**

1	2023-01-24	ADDENDUM REVISION 1
1/R	2022-11-02	BID SET
I/R	DATE	DESCRIPTION

**PROJECT/TERM CONTRACT NUMBER**

Contract No. 18-2586

**SHEET TITLE**

**SITE STRUCTURE  
SECTIONS - BATTERY**

**SHEET NUMBER**

**SS405**

**ATTACHMENT #3**  
**REVISED SPECIFICATION**  
**TABLE OF CONTENTS**

*(ATTACHED)*

## **TABLE OF CONTENTS**

### **Bid Set Package 4 Submittal**

#### **PART 1: GENERAL CONDITIONS**

General Conditions

#### **PART II: TECHNICAL SPECIFICATIONS**

##### **Division 01 - General Requirements**

011000	Summary of Work
012100	Allowances
012400	Value Engineering
012900	Payment Procedures
013100	Project Management and Coordination
013200	Construction Progress Documentation
013233	Photographic Records
013250	Critical Path Method (CPM) Schedule
013300	Submittal Procedure
103526	Safety and Health Requirements
014000	Quality Requirements
014100	Special Inspections
015000	Temporary Facilities, Services, and Controls
015528	Maintenance and Protection of Traffic (NYCDOT)
015639.4	Temporary Tree and Plant Protection
016000	Product Requirements
017300	Execution Requirements
017329	Cutting and Patching
017419	Construction and Demolition Waste Management
017419A	Specifications for Handling, Transportation, and Disposal of Potential and Identified Contaminated Hazardous Materials
017700	Closeout Procedures
017829	Survey and Layout Control
017839	Contract Record Documents
018113	Sustainable Design Requirements
018119	Construction Indoor Air Quality Requirements

##### **Division 02 – Existing Conditions**

024113	Selective Site Demolition
024114	Monument Salvaging, Storage and Re-Installation
024116.53	Marine Selective Demolition
024200.4	Site Material Salvaging

##### **Division 03 – Concrete**

031000	Concrete Formwork
--------	-------------------

031516	Post Installed Anchor Bolts and Reinforcing Bars
033000	Cast-In-Place Concrete
033101	Marine Concrete
033200	Joints in Concrete
034134	Precast Structural Concrete
034501	Precast Concrete Units for Pier A Inlet

**Division 04 – Masonry**

044300.04	Landscape Stone Masonry
-----------	-------------------------

**Division 05 – Metals**

050513	Hot Dip Galvanizing
051200	Structural Steel
055005	Flood Gate Inlaid Panels
055010	Miscellaneous Metals
055214.4	Railings and Guardrails for Pier A Inlet Walkway
055301	Metal Gratings for Park Areas

**Division 06 – Wood, Plastics, and Composites**

061501.4	Wood at Park Areas
----------	--------------------

**Division 09 – Finishes**

099100	Painting
099627	Coating of Steel Waterfront Structures
099713.23	Stainless Steel Coating
099800	Stainless Steel Protective Treatment

**Division 10 – Specialties**

101453.1	Traffic Signage (NYCDOT)
----------	--------------------------

**Division 22 – Plumbing**

220513	Common Motor Requirements for Plumbing Equipment
220519	Meters and Gages for Plumbing Piping
220523	General Duty Valves for Plumbing System
221116	Domestic Water Piping
221119	Domestic Water Piping Specialties

**Division 26 – Electrical**

260519	Low-Voltage Electrical Power Conductors and Cables
260526	Grounding and Bonding for Electrical Systems
260533	Raceways and Boxes for Electrical Systems
260543	Underground Ducts and Raceways for Electrical Systems
260553	Identification for Electrical Systems

260923	Lighting Control Devices
260943	Digital Network Lighting Controls
265100	Architectural Lighting
265613	Lighting Poles
265619	LED Exterior Lighting

**Division 27 – Communications**

275131	FDNY Fire Communications Systems
--------	----------------------------------

**Division 31 – Earthwork**

310000	Earthwork
310913	Monitoring of Adjacent Structures
311100	Clearing and Grubbing
311316	Selective Tree Pruning Fertilizing and Decompaction
312323.33	Flowable Fill
312500	Erosion and Sedimentation Controls
313223	Jet Grouting
313224	Permeation Grouting
316201	Pile Load Testing
316333	Micropiles

**Division 32 – Exterior Improvements**

321000	Roadway Resurfacing and Restoration (NYCDOT)
321123	Aggregate Base Courses
321373	Landscape Joint Sealants
321400.4	Unit Paving
321540	Stone Dust Paving
321724	Bikeway Pavement Markings and Signage
323300.4	Site Furnishings
328400	Planting Irrigation
329100.4	Planting Soil
329200.4	Turf and Grasses
329300.4	Plants
329600	Transplanting

**Division 33 – Utilities**

331700	Water Distribution
333000	Sanitary Sewerage
334000	Storm Drainage
334610	Foundation Drainage

**Division 34 – Transportation**

347113.1	Fixed and Operable Bollards
----------	-----------------------------

**Division 35 – Waterways and Marine Construction**

352016 Flood Gates

**Division 40 – Process Integration**

400559.05 Hydraulic Gates



**ATTACHMENT #4**  
**REVISED SPECIFICATION 044300.4 –**  
**LANDSCAPE STONE MASONRY**

*(ATTACHED)*

## SECTION 044300.4 – LANDSACPE STONE MASONRY

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. Section includes the following applications of stone masonry:
  - 1. Solid Stone block walls.
  - 2. Solid stone and stone veneer walls and cap stones anchored and/or adhered to concrete.
  - 3. Stone veneer and capstones anchored and/or adhered to concrete bulkhead areas.
  - 4. Stone step treads anchored and/or adhered to concrete.
  - 5. Solid stone seating units.
  - 6. Installation of site-salvaged stone.
  - 7. Delegated design for stone attachment systems.
  - 8. Slip resistance testing in laboratory and on site.
- B. Related Requirements:
  - 1. Section 014000 "Quality Requirements" for delegated design.
  - 2. Section 024200 "Site Material Salvaging" for salvaged stone block wall units installed as part of the work of this section.
  - 3. Section 032100 "Reinforcement Bars" for reinforcement in concrete substrate.
  - 4. Section 033000 "Cast-in-Place Concrete" for concrete substrate for stone-clad walls, curbs and pavements.
  - 5. Section 055214.4 "Park Area Railings and Guardrails" for handrails and guardrails embedded in stone steps, walls, and curbs.
  - 6. Section 321373 "Landscape Joint Sealants" for joint sealants in expansion and contraction joints.
  - 7. Section 321400 "Unit Paving" for stone pavers and curbs, including site salvaged materials.
  - 8. Section 323300 "Site Furnishing" for skate stops installed in stone seat wall, solid stone seating units, and step units.

### 1.03 DELEGATED DESIGN

- A. Stone Attachment System Design: Design, fabricate any necessary kerfing, fixing, anchoring or attachment system including a structural engineering analysis by a qualified Professional Engineer, using the following performance requirements and design criteria.
  - 1. Stone size, joint size, pattern and location as shown on the Drawings.
- B. Withstand movements or forces as a result of the structure, or internal or external forces and conditions acting on the structure including thermal movements.
  - 1. Mechanical fix enabling the removal and replacement, or post fixing installation, of any panel individually.
  - 2. Mechanically secure all structural and non-structural components in place for all applied directions of force, including upwards. Gravity and friction shall not be relied upon.
  - 3. Hidden, non-staining and non-corrosive stone attachments.
  - 4. Comply with ASTM C1242.

### 1.04 REFERENCE STANDARDS

- A. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.
- B. The latest edition, as of the date of the executed construction contract, of referenced standards listed below applies to this contract.
  - 1. American Concrete Institute (ACI)
    - a. ACI 530 – Building Code Requirements and Specification for Masonry Structures and Companion Commentaries.
  - 2. American National Standard Institute (ANSI)
    - a. ANSI A326.3 American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials.
  - 3. American Society for Testing Materials (ASTM)
    - a. ASTM C 97 – Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone.
    - b. ASTM C99 – Standard Specification for Marble Dimension Stone
    - c. ASTM C 119– Terminology Relating to Dimension Stone.
    - d. ASTM C 170 – Test Method for Compressive Strength of Dimension Stone.
    - e. ASTM C270 – Standard Specification for Mortar for Unit Masonry.
    - f. ASTM C503 – Standard Specification for Marble Dimension Stone

- g. ASTM C615 – Specification for Granite Dimension Stone.
- h. ASTM C880 – Test Method for Flexural Strength of Dimensional Stone.
- i. ASTM C615 – Standard Specification for Granite Dimension Stone.
- j. ASTM C-979 – Standard Specification for Pigments for Integrally Colored Concrete.
- k. ASTM C1242 – Standard Guide for Selection, Design, and Installation of Dimension Stone Attachment Systems.
- l. ASTM D1056 – Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber.
- m. ASTM E303 - Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.
- 4. Marble Institute of America (MIA)
  - a. Dimension Stone Design Manual, Latest Version.
- 5. National Building Granite Quarries Association (NBGQA)
  - a. Specifications for Architectural Granite.

#### 1.05 ACTION SUBMITTALS

- A. Product Data: For each variety of stone, stone accessory, and other manufactured product specified including but not limited to setting materials and sealants.
  - 1. Dry mortar mix
  - 2. Mortar pigment
    - a. submit manufacturer's full range of custom and standard colors for selection by the Engineer and Landscape Architect
  - 3. Latex modified Portland cement
  - 4. Anchors
  - 5. Anchor adhesives
  - 6. Miscellaneous masonry accessories
  - 7. Masonry cleaners
  - 8. Damproofing
    - a. For damproofing, submit manufacturer's detailed installation guidelines.
- B. Samples for Verification:
  - 1. Submit three sets for each color, grade, finish, and variety of stone required. Include 2 or more samples in each set showing the full range of variations expected in these characteristics. Each sample shall be not less than 18"x18". Include test reports for slip resistance for stone types used at step units.
  - 2. Submit three colored mortar samples for each color selected by the Engineer and Landscape Architect.
  - 3. Provide full size sample of incised text in stone showing at least two letters from text indicated on the drawings.

4. Approved sample set shall establish the standard by which stonework finish shall be judged.
- C. Shop Drawings: Show fabrication and installation methods, including plans at not less than 1/4" = 1'-0" scale, elevations at 1/2" = 1'-0" scale and details at not less than 3" = 1'0" scale. Indicate required dimensions, materials, joint sizes, finishes, substructure, all fastening devices and **miscellaneous accessory items required for a complete installation**. Include coordination details for related and adjoining work.
1. Dimensions of each stone type, size and finish of exposed faces coordinated with site salvaged stone to be re-installed, including site salvaged stone material on- or off-site shaping or fabrication required. Identify each stone piece on shop drawings to allow for ease of field installation.
  2. Provide detailed summary of linear foot and square foot quantities and locations of site salvaged stone included.
  3. Provide detailed stonework layout and jointing showing each stone unit position and identifying number of each stone type & size with calculations verifying that stone and joints will fit within tolerances. Show all unique stone sizes at expansion joints or meeting of adjacent work.
  4. Provide layout and detailing of incised text showing full text and letter spacing.
  5. Show cutting, drilling detail and recesses fully coordinated with shop drawing for adjacent work including electrical, lighting, plumbing, steps, corners, handrails and guardrails, and skate stops.
  6. Show fixing and fastening details and **miscellaneous hardware required for stone unit attachment to concrete backup**, support and restraint with calculations to verify the structural adequacy of the attachment signed and sealed by the qualified Professional Engineer.
  7. The Landscape Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the design, certification or approvals performed by the qualified Professional Engineer.
- D. Delegated-Design Submittal: In addition to signed and sealed shop drawings for floodwall masonry attachments, provide analysis data and calculations signed and sealed by the qualified professional engineer responsible for their preparation. indicating that the railing and guardrail installation complies with design loads.
- E. Method for repairing damage to stone for approval by Landscape Architect.

#### 1.06 INFORMATIONAL SUBMITTALS

- A. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, sources of supply, and other

information as required to identify materials used. Include mix proportions for mortar and source of aggregates.

1. Submittal is for information only. Neither receipt of list nor approval of mockups constitutes approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Landscape Architect and approved in writing.

B. Qualification Data:

1. For Stone Fabricator.
2. For qualified Installer.
3. For qualified Professional Engineer.
4. For qualified Testing Laboratory

C. Material Test Reports:

1. Stone Test Reports: For each stone variety proposed for use on Project, by a qualified testing agency, indicating compliance with required physical properties, other than abrasion resistance, according to referenced ASTM standards. Base reports on testing done within previous three years.
2. Sealant Compatibility and Adhesion Test Report: From sealant manufacturer indicating that sealants will not stain or damage stone. Include interpretation of test results and recommendations for primers and substrate preparation needed for adhesion.
3. Slip Resistance Evaluation: Test Reports completed in a laboratory prior to fabrication and test reports completed on site after completion of mock up and installation.

## 1.07 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For stonework to include in maintenance manuals. Include product data for stone-care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

## 1.08 QUALITY ASSURANCE

- A. Installer Qualifications: Engage who employs stonemasons and stone fitters with at least 5 years of experience and who have successfully completed stone installations similar in material, design, and extent to that indicated for Project.
1. Qualifications shall include evidence and experience of skilled craftsmen or individuals who specialize in the handling, placement, assembling and finishing the materials and products required for stone installation.

- B. Fabricator Qualifications: Use a fabricator that employs skilled workers who fabricate stone masonry and has production facilities capable of producing stone shapes, sizes and finishes similar to those indicated for this Project and whose products have a record of successful in-service performance.
- C. Testing Laboratory Qualifications: A third-party, independent ASTM certified testing laboratory not owned or operated by the stone material supplier, contractor or installing contractor.
- D. Delegated Design Professional: A qualified Professional Engineer licensed in the state of New York.
- E. Source Limitations for Stone: Obtain each variety of stone, regardless of finish, from one quarry with resources to provide materials of consistent quality in appearance and physical properties.
- F. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component or system and from single source or producer for each aggregate.
- G. Slip Resistance Evaluation: Stone surfaces expected to be walked on when wet shall be tested in accordance with ASTM E303 to meet a minimum British Pendulum Number (BPN) of 45.
  - 1. Testing shall be performed on contractor supplied samples of the approved finished walking surface of each type of stone used for step units in the following locations:
    - a. Laboratory:
      - 1) Test results shall be submitted during the sample submittal process for material approval.
      - 2) Testing shall be performed by testing laboratory. Reports shall include identification of the finished samples and test results. Product literature will not be accepted. The cost of testing and reporting shall be paid for by the Contractor.
    - b. Field (1):
      - 1) Mockup areas.
      - 2) Test reports for surface evaluation of at least three step units of each stone type shall be performed by a testing laboratory. Include identification of the materials, areas tested with photographs and results.
    - c. Field (2):

- 1) At completion of the work on at least three step units of each stone type that were not tested as part of the mock up areas. Reporting as above.
  - 2) The cost of testing for Field (1 and 2) testing and any necessary retesting and reporting shall be paid for by the Contractor.
- H. Mockups: Build mockups to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Build a 5-foot wide by full height of the flood wall veneer as shown on the approved shop drawings for review and approval showing full size and thickness of masonry including anchoring, mortar backup, and jointing. Include cap stone over full width of mockup. Location of the mockup shall be determined by the Engineer and the Landscape Architect prior to the start of the mock-up.
  2. Build a mockup of two adjacent exterior stone block wall units along the Batter Place sidewalk units including full jointing. Location of the mockup shall be determined by the Engineer and the Landscape Architect prior to the start of the mock-up.
  3. Build a mockup of three full size stair stone units within the Pier A plaza adjacent to a sloped sidewalk area showing setting bed, jointing, and skateboard deterrent elements. Location of the mockup shall be determined by the Engineer and the Landscape Architect prior to the start of the mockup. Complete slip resistance testing in this location as indicated in Quality Assurance Article of this specification. Submit test results.
  4. Protect accepted mockups from the elements with weather-resistant membrane.
  5. Approval of mockups is for color, texture, and blending of stone; relationship of mortar and sealant colors to stone colors; tooling of joints; and aesthetic qualities of workmanship.
    - a. Approval of mockups is also for other material and construction qualities the Engineer and Landscape Architect specifically approves in writing.
    - b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Engineer and the Landscape Architect specifically approves such deviations in writing.
  6. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- I. Pre-installation Conference: Conduct conference at Project site.



#### 1.09 DELIVERY STORAGE AND HANDLING

- A. Coordinate with Construction Manager for location of material storage and staging.
- B. Deliver materials to Project site in undamaged condition.
- C. Store and handle stone and related materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, or other causes.
- D. Store aggregates where gradation and other required characteristics can be maintained and contamination avoided.
- E. Deliver pre-blended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store pre-blended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.
- F. Do not use cementitious materials that have become damp.
- G. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

#### 1.10 PROJECT CONDITIONS

- A. Protection of Stone Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed stone masonry when construction is not in progress.
  - 1. Extend cover a minimum of 24 inches (600 mm) down both sides and hold cover securely in place to prevent weather from displacing cover.
- B. Stain Prevention: Immediately remove mortar and soil to prevent them from staining the face of stone masonry.
  - 1. Provide cover secured in place to protect base of walls from rain-splashed mud and mortar splatter by coverings spread on the ground and over the wall surface.
  - 2. Protect sills, ledges, and projections from mortar droppings.
  - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
  - 4. Turn scaffold boards near the wall on edge at end of each day to prevent rain from splashing mortar and dirt on completed stone masonry.

- C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace stone masonry damaged by frost or freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
  - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until masonry has dried, for a minimum of 7 days after completing cleaning.
- D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

## 1.11 COORDINATION

- A. Coordinate construction of and field measurement of completed concrete substrates to receive stone work.
- B. Coordinate the installation of available site salvaged stone masonry with the installation of stone masonry as indicated on the drawings and approved shop drawings, including on- or off-site modification of site salvaged stone masonry.
- C. Coordinate the labeling of stone units shipped to the site with the unit labels shown on the approved shop drawings.
- D. Coordinate the production and shipping of stone to the site in in a manner that allows for progressive completion of work areas without gaps in completion or delays that will impact the completion of work by other trades.
- E. Coordinate installation of stone work with work by other trades including skate stops, light pole foundations and anchor bolts, conduits railing and guardrail work, including necessary detailing of attachments into or through stone units or or anchorages through stone into or onto concrete substrates.

## PART 2 - PRODUCTS

### 2.01 DESIGN INTENT

- A. Maximize the use of site salvaged stone in the installation of work of this section.

1. Modify site salvaged stone as required on- or off-site as necessary at no additional cost to the owner.
2. Supplement site salvaged stone with new stone to match adjacent site salvaged materials of the same type same type as specified herein if site salvage quantities are insufficient or cannot be modified to achieve the available the indicated shape of size masonry indicated on the drawings.

## 2.02 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design masonry attachments to concrete floodwall sufficient to support the weight and position of the stone veneer and capstones under anticipated storm surge conditions as outlined in the Engineering Basis of Design.

## 2.03 MANUFACTURERS

- A. Source Limitations for Stone: Obtain each variety of stone, regardless of finish, from single quarry, whether specified in this Section or in another Section of the Specifications, with resources to provide materials of consistent quality in appearance and physical properties.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of uniform quality for each cementitious component from single manufacturer and each aggregate from single source or producer.

## 2.04 APPLICATIONS/SCOPE

- A. The Drawings and Specifications establish requirements for aesthetics and performance of cut stone assemblies. Aesthetics are indicated by dimensions, color range, arrangement, alignment and profiles of components and assemblies as they relate to sight lines and relationships to one another and to adjoining work. Performance is indicated by requirements specified.
- B. Aesthetics, are subject to the Engineer's and Landscape Architect's approval and only to the extent exclusively needed to comply with performance requirements. Where modifications are proposed, submit data to the Engineer and Landscape Architect for review and approval.

2.05 STONE, GENERAL

- A. Stone Materials: Standard grade, free of crack or seam which may impair its structural integrity or function and shall comply with industry standards and practices specified.

2.06 GRANITE

- A. Granite: Comply with ASTM C615/C615M and NBGQA “Specifications for Architectural Granite Part 2 Materials”.

- 1. Stone Type A:

- a. Size and Shape: As indicated on the Drawings.
- b. Color and Grain: Polycor Jet Mist, color and patterning to match existing Jet Mist paver color at the Museum of Jewish Heritage for Contract Area 2 and Battery Place Wall for Contract Area 3 as approved by the Landscape Architect.
- c. Quarry Source Location: Subject to meeting the requirements, Elverson, PA.
- d. Finish:
  - 1) Exposed Faces: As indicated on the Drawings.
  - 2) Concealed Faces: Sawn.

- 2. Stone Type D:

- a. Size and Shape: As indicated on the Drawings.
- b. Color and Grain: Polycor Stanstead Gray
- c. Quarry Source Location: Stanstead, Quebec, Canada.
- d. Finish:
  - 1) Exposed Faces: As indicated on the Drawings.
  - 2) Concealed Faces: Sawn.

- 3. Stone Type E:

- a. Size and Shape: As indicated on the Drawings.
- b. Color and Grain: Stoney Creek, color and patterning to match existing Stony Creek stone within the project area as approved by the Landscape Architect.
- c. Quarry Source Location: Subject to meeting the requirements, Branford, CT.
- d. Finish:
  - 1) Exposed Faces: As indicated on the Drawings.
  - 2) Concealed Faces: Sawn.

- 4. Stone Type F

- a. Size and Shape as indicated on the Drawings.
- b. Color and Grain: St. Henry Black.
- c. Quarry Source Location: Saint-Henri-de-Taillon, Quebec, CA.
- d. Finish:

- 1) Exposed Faces: As indicated on the Drawings.
- 2) Concealed Faces: Sawn.

## 2.07 MARBLE

- A. Marble: Comply with Marble: ASTM C503/C503M
  1. Stone Type C:
    - a. Size and Shape: As indicated on the Drawings.
    - b. Color and Grain: Polycor Pearl Gray.
    - c. Quarry Source Location: Tate, GA.
    - d. Finish:
      - 1) Exposed Faces: As indicated on the Drawings.
      - 2) Concealed Faces: Sawn.

## 2.08 MORTAR MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
  1. Do not use calcium chloride.
  2. Limit cementitious materials in mortar to Portland cement and lime.
  3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Comply with referenced standards and with manufacturers' written instructions for mix proportions, mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures needed to produce mortar of uniform quality and with optimum performance characteristics.
- C. Mixing: Combine and thoroughly mix cementitious materials, water, and aggregates in a mechanical batch mixer, unless otherwise indicated. Discard mortar when it has reached initial set.
- D. Mortar Setting Bed - Non-staining sand mixed with liquid latex additive in quantity recommended by manufacturer.
- E. Performance Requirements: Compressive Strength 4,000 psi min.

- F. Pre-blended, Dry Mortar Mix: Furnish dry mortar ingredients in the form of a pre-blended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- G. Mortar Pigment: Comply with ASTM C-979, inert, stable to atmospheric conditions, sunfast, weather resistant, alkali resistant, water insoluble, lime proof, nonbleeding natural and synthetic iron oxides, free of deleterious fillers and extenders.
- H. Mortar for Stone Masonry: Comply with ASTM C 270, Proportion Specification.
  - 1. Mortar for Setting Stone: Type S below grade, Type N above grade.
  - 2. Mortar for Pointing Stone: Type N.
- I. Latex-Modified Portland Cement Setting Mortar: Flexible polymer-modified Portland cement mortar, complying with ANSI A118.4 and ISO 13007. Proportion and mix Portland cement, aggregate, and latex additive to comply with latex-additive manufacturer's written instructions.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by:
    - a. Quikrete; Deck Mud with Concrete Acrylic Fortifier.
    - b. Latircrete International, 3701 Fortified Mortar Bed.
    - c. MAPEI Corp, Kerabond/Keralastic System.
- J. Cement-Paste Bond Coat: Mix either neat cement and water or cement, sand, and water to a consistency similar to that of thick cream.
  - 1. For latex-modified Portland cement setting-bed mortar, substitute latex admixture for part or all of water, according to latex-additive manufacturer's written instructions.
- K. Water: Potable.

## 2.09 ANCHORS, ATTACHMENTS AND MISCELLANEOUS HARDWARE

- A. Shapes and plates including anchors, dowels, clips, bolts, washers and shims:
  - 1. Stainless Steel, Type 316, ASTM A240 and ASTM A276.

## 2.10 MASONRY ACCESSORIES

- A. Compressible Filler: Pre-molded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene urethane or PVC.

- B. Cementitious Dampproofing: Cementitious formulations that are non-staining to stone, compatible with joint sealants, and noncorrosive to veneer anchors and attachments.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Xypex Concentrate, as manufactured by Xypex Chemical Corporation 13731 Mayfield Place, Richmond, B.C., Canada. (800) 961-4477
    - b. Approved Equal.
- C. Weep Hole Products: Use one of the following unless otherwise indicated:
  - 1. Wicking Material: Absorbent rope, made from UV-resistant synthetic fiber, 1/4 to 3/8 inch (6 to 10 mm) in diameter, in length required to produce 2-inch (50-mm) exposure on exterior and 18 inches (450 mm) in cavity behind stone masonry. Use only for weep holes.
  - 2. Round Plastic Tubing: Medium-density polyethylene, 3/8-inch (10-mm) OD by thickness of stone masonry.
  - 3. Rectangular Plastic Tubing: Clear butyrate, 3/8 by 1-1/2 inches (10 by 38 mm) by thickness of stone masonry.
- D. Tread Warning Strip Infill: Black color epoxy resin base with black carborundum grit rated for exterior use.

## 2.11 MASONRY CLEANERS

- A. Use cleaners as recommend by stone producer/manufacturer.
  - 1. standard-strength cleaner designed for removing mortar and grout stains, efflorescence, and other new construction stains from stone masonry surfaces without discoloring or damaging masonry surfaces; expressly approved for intended use by both cleaner manufacturer and stone producer.

## 2.12 FABRICATION

- A. Fabricate stone to comply with sizes, shapes, and tolerances recommended by applicable stone association.
  - 1. For granite, comply with recommendations in NBGQA's "Specifications for Architectural Granite Part 3."
- B. Cut stone to produce pieces of thickness, size, and shape indicated, including details on Drawings and approved shop drawings. Dress joints (bed and vertical) straight and at right angle to face unless otherwise indicated. Water jet cut curved stone.

- C. Create incised text in stone with uniform depth, uniform texture, and cleanly cut edges.
- D. Cut and drill sinkages and holes in stone for anchors and supports, skate stops, railing and guardrail posts, light poles, conduits, and wood slat attachments.
- E. Carefully inspect stone at quarry or fabrication plant for compliance with requirements for appearance, material, and fabrication. Replace defective units before shipment.
  - 1. Clean sawed backs of stone to remove rust stains and iron particles.
- F. Stone Sizes and Shapes: Refer to Drawings.
- G. Finish exposed faces and edges of stone to comply with requirements indicated on the Drawings for finish and to match approved samples, shop drawings and mockups.

## 2.13 FABRICATION TOLERANCES

- A. Thickness less than 1 5/8 inch: Plus or minus 1/8 inch.
- B. Thickness greater than 1 5/8 inch: Plus or minus 1/8 inch.
- C. Panel face dimension: Plus or minus 1/16 inch.
- D. Panel face variation from rectangular (maximum out of square): Plus or minus 1/16 inch.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Examine surfaces indicated to receive stone masonry, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Examine substrate to verify that dovetail slots, inserts, reinforcement, veneer anchors, flashing, and other items installed in substrates and required for or extending into stone masonry are correctly installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.



### 3.02 PREPARATION

- A. Coat concrete and unit masonry backup with cementitious dampproofing in accordance with the manufacturer's written instructions, including wet curing of dampproofing material.
- B. Clean dirty or stained stone surfaces by removing soil, stains, and foreign materials before setting. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives.

### 3.03 SETTING OF STONE MASONRY, GENERAL

- A. During installation, protect adjacent planting soil areas and plants from damage. Shield plants and planting soils from dust, debris or liquid contamination related to masonry trimming, cutting, or installation.
- B. Erect stone in accordance with industry standards and approved shop drawings. Setting and handling shall be done by competent setter, riggers, and handlers, thoroughly experienced in work of this type and scope.
- C. Set stone in accordance with approved setting drawings. Provide anchors, supports, fasteners and other attachments shown or necessary to secure stonework in place and keep stone in level, plumb and square position with uniform joints.
- D. Sort stone before it is placed to find and remove stone that does not comply with requirements relating to aesthetic effects, physical properties, or fabrication, or that is otherwise unsuitable for intended use.
- E. Arrange stones with color and size variations as indicated on approved shop drawings or, where multiple units of the same size and shape occur, uniformly dispersed for an evenly blended appearance.
- F. Completely fill holes, slots and other sinkages for anchors with mortar or caulking during setting of stone.
- G. Use skilled mechanics and skilled stone fitters at the site to do necessary field cutting as stones are set.
  - 1. Use power saws to cut stones; for exposed edges, produce edges which are cut straight and true with edges eased slightly to prevent snipping.

2. Mallet and chisel cutting will be permitted provided craftsmen are skilled in their use.
- H. Provide chases, reveals, reglets, openings and other spaces as indicated for accommodating contiguous work. Close up openings in stonework after other work is in place with stonework which matches that already set.
- I. Set stones to comply with requirements indicated on drawings and shop drawings. Install anchors, supports, fasteners and other attachments indicated or necessary to secure stonework in place to comply with requirements indicated on Drawings and approved shop drawings. Adjust anchors, supports shims and accessories to set stone accurately in locations indicated with edges and faces aligned according to established relationships and indicated tolerances. Set stone with the minimum number of shims.
- J. For stones supported on clip or continuous angles, set stones on non-corrosive and non-staining shim material in sufficient area to support the load. Mortar may be used in lieu of shims provided that setting pads are provided to maintain joint sizes if stone weight squeezes out mortar.
- K. Place setting buttons of adequate size, in sufficient quantity, and of same thickness as indicated joint width, to prevent mortar from squeezing out and to maintain uniform joint widths. Hold buttons back from face of stone to provide space for backer rope and sealant.
- L. The joint between bottom of relieving angles and top surface of stones below angles shall be free of mortar or shims to avoid load transfer.
- M. Keep cavities open where unfilled space is indicated between back of stone veneer and backup wall; do not fill cavities with mortar or grout.
- N. Provide expansion and contraction joints, control joints and pressure-relieving joints of widths and at locations indicated or required. Expansion joints shall not be covered with mortar or other rigid material. Expansion joint are to be located prior to cutting and setting anchors.
- O. Maintain uniform joint width of 3/8 inch.
- P. Provide sealant joints of widths and at locations indicated.
  1. Keep sealant joints free of mortar and other rigid materials.
  2. Sealing joints is specified in Section 321373 "Landscape Joint Sealants."
- Q. Install embedded metal work and weep holes at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.

- R. Place weep holes and vents in joints where moisture may accumulate, including at base of cavity walls, above shelf angles, and at flashing.
  - 1. Form weep holes.
  - 2. Use wicking material to form weep holes above flashing in stone sills. Turn wicking down at lip of sill to be as inconspicuous as possible.
  - 3. Space weep holes 24 inches on center.
  - 4. Trim wicking material used in weep holes flush with outside face of wall after mortar has set.
  - 5. Place pea gravel in cavities as soon as practical to a height of not less than 2 inches above top of flashing, to maintain drainage.
  - 6. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

### 3.04 INSTALLATION OF NON-CAVITY WALLS

- A. Anchor stone masonry with the type, number of anchors, to depths and at spacings shown on the approved delegated design shop drawings.
- B. Set stone in full bed of mortar with full head joints unless otherwise indicated. Fill cavity with mortar as stone is set and allow each course to dry before filling the next. Build anchors into mortar joints as stone is set. Between stones held initially by shims, force mortar into joints completely filling voids. Use sufficient setting mortar so a slight excess will be forced out the edges of stone units as they are set.
- C. Rake out joints for pointing with mortar to depth of not less than 3/4 inch (19 mm) before setting mortar has hardened. Rake joints to uniform depths with square bottoms and clean sides.

### 3.05 POINTING

- A. Prepare stone-joint surfaces for pointing with mortar by removing dust and mortar particles. Where setting mortar was removed to depths greater than surrounding areas, apply pointing mortar in layers not more than 3/8 inch (10 mm) deep until a uniform depth is formed.
- B. Point stone joints by placing and compacting pointing mortar in layers not more than 3/8 inch (10 mm) deep. Compact each layer thoroughly and allow to become thumbprint hard before applying next layer.

- C. Tool joints, when pointing mortar is thumbprint hard, with a smooth jointing tool to produce the following joint profile:
  - 1. Joint Profile: Concave, or smooth, flat face slightly below edges of stone or smooth, flat face recessed 1/4 inch (6 mm) below edges of stone.

### 3.06 CONSTRUCTION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces, do not exceed 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch in 40 feet or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/4 inch in 20 feet or 1/2 inch in 40 feet) or more.
- B. Variation from Level: Do not exceed 1/4 inch in 20 feet or 1/2 inch in 40 feet or more.
- C. Variation of Line: For position shown in plan, do not exceed 1/2 inch in 20 feet or 3/4 inch in 40 feet or more.
- D. Measure variation from level, plumb, and position shown in plan as variation of the average plane of the face of each stone from level, plumb, or dimensioned plane.
- E. Variation in Stone Joint Thickness: Not less than 1/4 inch at narrowest points or more than 1/2 inch at widest points.

### 3.07 POST-INSTALLATION TESTING

- A. Complete post-installation slip resistance testing in this location as indicated in Quality Assurance Article of this specification in locations as directed by the Engineer and Landscape Architect.
- B. Submit testing results.

### 3.08 REPAIRING

- A. Remove and replace stone masonry of the following description:
  - 1. Broken, chipped, stained, or otherwise damaged stone. Stone may be repaired if methods and results are approved by Landscape Architect.
  - 2. Defective joints.
  - 3. Stone masonry not matching approved samples and mockups.

4. Stone masonry not complying with other requirements indicated.

- B. Replace in a manner that results in stone masonry matching approved samples and mockups, complying with other requirements, and showing no evidence of replacement.

### 3.09 PROTECTING

- A. Protect during construction with non-staining kraft paper. Where masonry work is adjacent construction vehicle access, cover stone work faces with a minimum of 3/4-inch (20-mm) untreated plywood over non-staining kraft paper.
- B. Protect and maintain installed stone work through construction period.
- C. Remove protection for Substantial Completion inspection.

### 3.10 CLEANING

- A. In-Progress Cleaning: Clean stone masonry as work progresses. Remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean stone masonry as follows:
- C. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
1. Test cleaning methods on mockup; leave one-half of panel uncleaned for comparison purposes. Obtain Landscape Architect's approval of sample cleaning before cleaning stone masonry.
  2. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
  3. Clean stone masonry by bucket and stainless steel brush hand-cleaning method described in BIA Technical Note No. 20 Revised II, using job-mixed detergent solution.
  4. Only clean stone masonry with proprietary acidic cleaner if approved by manufacturer's written instructions.

3.11 REMOVING EXCESS MATERIALS AND WASTE

- A. Removal: Remove excess material off site and legally recycle or dispose.

END OF SECTION 044300.4

**ATTACHMENT #5**  
**REVISED SPECIFICATION 055301 –**  
**METAL GRATINGS FOR PIER A INLET WALKWAY**

*(ATTACHED)*

## SECTION 055301 – METAL GRATINGS FOR PIER A INLET WALKWAY

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. Section Includes:

1. Stainless steel metal bar gratings at Pier A inlet walkway.
2. Anti-slip surfacing.
3. Slip resistance testing.

- B. Related Requirements:

1. Section 018113 "Sustainability Requirements" for documentation of recycled material content of metal grating materials.
2. Section 051200 "Structural Steel" for additional requirements for steel framing and supports for metal gratings.
3. Section 055010 "Miscellaneous Metals" for additional requirements for steel framing and supports for metal gratings.
4. Section 055214.4 "Park Area Railings and Guardrails" for handrails and guardrails attached to the perimeter framing of metal grating surfacing areas.

#### 1.03 PERFORMANCE REQUIREMENTS

- A. Structural Performance of Gratings: Provide gratings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Walkways and Elevated Platforms: Uniform load of 100 psf or concentrated load of 300 lbf, whichever produces the greater stress.
2. Limit deflection to L/240 or 1/4 inch, whichever is less.

#### 1.04 REFERENCE STANDARDS

- A. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations,



suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

- B. The latest edition, as of the date of the executed construction contract, of referenced standards listed below applies to this contract.
  - 1. American Society for Testing Materials (ASTM)
    - a. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes.
    - b. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
    - c. ASTM C 633 - Adhesion or Cohesive Strength of Flame-Sprayed Coatings.
    - d. ASTM E 140 - Hardness Conversion Tables for Metals.
    - e. ASTM E303 - Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.
    - f. ASTM E 384 - Microhardness of Materials.
    - g. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
    - h. ASTM F594 - Standard Specification for Stainless Steel Nuts.
  - 2. American Welding Society (AWS)
    - a. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

#### 1.05 ACTION SUBMITTALS

- A. Product Data:
  - 1. Grating
  - 2. Anti-Slip Surfacing.
- B. Sustainable Design Submittals:
  - 1. Certificates indicating recycled material content for stainless steel materials.
- C. Slip Resistance Evaluation: Test Reports completed in a laboratory prior to fabrication and test reports completed on site after completion of installation.
- D. Shop Drawings: Include plans, elevations, sections, details, attachments, and attachments to other work.
  - 1. Coordinate shop drawings with shop drawing of metal grating support members, edging and attachment of guardrails.
- E. Samples for Initial Selection:
  - 1. Grating: Provide a 12"x24" sample of the grating of the indicated grating member sizing with anti-slip surfacing. Include laboratory test report of slip resistance.

## 1.06 INFORMATIONAL SUBMITTALS

- A. Qualification Data:
  - 1. Grating Manufacturer.
  - 2. Anti-Slip Surfacing Manufacturer.
  - 3. Installer
  - 4. Testing Lab.
- B. Welding certificates.
- C. Mill Certificates: Signed by manufacturers of stainless steel products, certifying that products furnished comply with requirements.

## 1.07 QUALITY ASSURANCE

- A. Qualifications:
  - 1. Grating Manufacturer: A manufacturer with a minimum of five years of experience producing gratings of similar materials and dimensions.
  - 2. Anti-Slip Surfacing Manufacturer: A manufacturer with a minimum of five years of experience producing slip resistant surfacing on metal panels.
  - 3. Installer: An installer with a minimum of five years of experience installing similar grating systems.
  - 4. Testing Laboratory: A third-party, independent ASTM certified testing laboratory not owned or operated by the stone material supplier, contractor or installing contractor.
- B. Welding: Qualify procedures and personnel according to the following:
  - 1. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."
- C. Source Restrictions: Obtain gratings and slip resistant surfacing each from a single manufacturer.
- D. Slip Resistance Evaluation: Metal grating expected to be walked on when wet shall be tested in accordance with ASTM E303 to meet a minimum British Pendulum Number (BPN) of 45.
  - 1. Testing shall be performed on metal grating prepare with non-slip surface in the following locations:
    - a. Laboratory:
      - 1) Test results shall be submitted during the submittal process for material approval.
      - 2) Testing shall be performed by testing laboratory. Reports shall Include identification of the finished samples and test results. Product literature will not be accepted. The cost of testing and reporting shall be paid for by the Contractor.

b. Field:

- 1) At completion of the work, test at least three separate grating unit locations. Include identification of the materials, areas tested with photographs and results.
- 2) The cost of testing for Field testing and any necessary retesting and reporting shall be paid for by the Contractor.

E. Pre-installation Conference: Conduct conference at Project site.

## 1.08 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of support framing, bulkhead walls and other construction contiguous with gratings by field measurements before fabrication and indicate measurements on Shop Drawings.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating gratings without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions.
2. Provide allowance for trimming and fitting at site.
3. Field welding of metal grating materials is not permitted.

## 1.09 COORDINATION

A. Coordinate installation of anchorages for gratings, grating frames, handrails, guardrails and supports. Furnish setting drawings, templates, and directions for installing anchorages. Deliver such items to Project site in time for installation.

B. Coordinate design of grating closure and kick plates with handrails and guard rails.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

A. Subject to meeting the requirements, metal grating materials are available from the following manufacturers:

1. Brown Campbell
2. Nucor Grating
3. AMICO Grating

## 2.02 STAINLESS STEEL GRATING

- A. Recycled content for stainless steel materials: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 20 percent.
- B. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
  - 1. Stainless Steel Sheet, Strip, and Plate: ASTM A240/A240M or ASTM A666, Type 316L.
  - 2. Stainless Steel Bars and Shapes: ASTM A276/A276M, Type 316L.
- C. Metal Bar Grating Configuration:
  - 1. Bearing Bar Spacing: 7/16”.
  - 2. Bearing Bar Depth: 2 1/4”.
  - 3. Bearing Bar Thickness: 3/16”.
  - 4. Crossbar Spacing: 4”.
  - 5. Maximum Opening between Bearing Bars: 1/4” (ADA compliant and heel proof)
  - 6. Grating Style: Swaged locked.

## 2.03 FASTENERS

- A. General: Unless otherwise indicated, provide Type 316 stainless steel fasteners for exterior use.
- B. Stainless Steel Bolts and Nuts: Regular hexagon-head annealed stainless steel bolts, ASTM F593 (ASTM F738M); with hex nuts, ASTM F594 (ASTM F836M); and, where indicated, flat washers; Alloy Group 2 (A4).
- C. Furnish threaded bolts with nuts and washers, self-drilling fasteners with washers, or stainless steel flange clamps with stainless steel bolt for securing grating to framing supports.

## 2.04 FABRICATION

- A. Shop Assembly: Fabricate grating sections in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch material cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

- C. Form from materials of size, thickness, and shapes indicated, but not less than that needed to support indicated loads.
- D. Fit exposed connections accurately together to form hairline joints.
- E. Welding: Comply with AWS recommendations and the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
- F. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space the anchoring devices to secure gratings, frames, and supports rigidly in place and to support indicated loads.

## 2.05 STAINLESS STEEL FINISHES

- A. Finish: Commercially cleaned.
  - 1. Finish gratings after grating panels are assembled.

## 2.06 SLIP RESISTANT SURFACE

- A. Basis of Design for Slip Resistant Grating: SlipNOT® Metal Safety Flooring, Division of W.S. Molnar Company, 2545 Beaufait Street, Detroit, Michigan 48207, (800) 754-7668.
- B. Stainless Steel Surface on Stainless Steel Substrate: Abrasive material metallicity bonded to stainless steel walking surface.
  - 1. Type: Anti-slip, non-gritted, stainless steel surface on stainless steel substrate.
  - 2. Surface Texture: Grade 2, Medium.
  - 3. Surface: Anti-slip stainless steel surface consisting of a random hatch matrix.
  - 4. Surface Hardness, Rockwell C Scale, ASTM E 140 and E 384: Minimum of 55.
  - 5. Bond Strength, Surface to Substrate, ASTM C 633: Minimum of 4,000 psi.
  - 6. Coefficient of Friction, Anti-Slip Surface: Minimum of 0.6.
  - 7. UL Listed: Slip-resistant.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level metal framing, adjacent pavement finished grade, mounting

surfaces, installation tolerances, and other conditions affecting performance of the Work.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 INSTALLATION, GENERAL

- A. Install metal grating in accordance with manufacturer's writing instructions and the approved shop drawings.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing gratings. Set units accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
- C. Fit exposed connections accurately together to form hairline joints.
- D. Metal grating shall be mechanically fastened in place. Do not field weld metal gratings.

### 3.03 INSTALLING METAL BAR GRATINGS

- A. General: Install gratings to comply with recommendations of referenced metal bar grating standards that apply to grating types and bar sizes indicated, including installation clearances and standard anchoring details.
- B. Attach grating units to supporting members with type and size of clips and fasteners indicated or, if not indicated, as recommended by grating manufacturer for type of installation conditions shown.
- C. Attach units to kick plates and supporting members by mechanical methods.
- D. Isolate dissimilar metals to prevent galvanic corrosion.

### 3.04 INSTALLATION TOLERANCES

- A. Surface Tolerance: Do not exceed 1/16-inch unit-to-unit offset from flush (lippage) or 1/8 inch in 10 feet from level, or indicated slope, for finished surface of grating.
- B. Lines and Locations: For location and alignment of units and edging or toe plates in plan, do not vary from straight by more than plus or minus 1/4 inch.

3.05 POST-INSTALLATION TESTING

- A. Complete post-installation slip resistance testing in this location as indicated in Quality Assurance Article of this specification in locations as directed by the Engineer and Landscape Architect.
- B. Submit testing results.

3.06 ADJUSTING AND CLEANING

- A. Adjust grating units to align between rows and edging conditions and to meet indicated tolerances.
- B. Clean grating and edging units to remove stains and scuff marks to match commercially cleaned finish as shown on the approved grating sample.
- C. Remove and legally dispose off-site excess materials and packaging.

END OF SECTION 055301

**ATTACHMENT #6**  
**REVISED SPECIFICATION 099800 –**  
**STAINLESS STEEL PROTECTIVE TREATMENT**

*(ATTACHED)*



## SECTION 099800 – STAINLESS STEEL PROTECTIVE TREATMENT

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. Section Includes:

- 1. Application of clear stainless steel protective treatment

- B. Related Requirements:

- 1. Section 055214.4 "Park Area Railings and Guardrails" for handrails and guardrails to receive protective treatment.

#### 1.03 REFERENCE STANDARDS

- A. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.
- B. The latest edition, as of the date of the executed construction contract, of referenced standards listed below applies to this contract.
  - 1. American Society for Testing Materials (ASTM)
    - a. ASTM B117 Standard Practice for Operating Salt Spray (Fog) Apparatus

#### 1.04 PRE-INSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.
  - 1. Review:
    - a. Site protection prior to start of work including but not limited to plants, planting soils, stone masonry, unit paving, irrigation and lighting.
    - b. Cleaning and preparation procedures for stainless steel handrails and guardrail elements to receive protective treatment.

- c. Environmental conditions, product mixing and application procedures.

#### 1.05 ACTION SUBMITTALS

- A. Product Data: Manufacturer's technical information, including Product Technical Data Sheets, Material Safety Data Sheets, detailing job site and personal safety instructions, product preparation and/or mixing instructions and application instructions for each material specified. Identify by manufacturer's catalog number and general classification.

#### 1.06 INFORMATIONAL SUBMITTALS

- A. Qualification Data for Installer.

#### 1.07 QUALITY ASSURANCE

- 1. Installer Qualifications: Installer with a minim of five years' experience with cleaning and preparation of stainless steel surfaces, and the application of clear inorganic protective treatments.

#### 1.08 DELIVERY STORAGE AND HANDLING

- A. Deliver materials in sealed containers with manufacturer's labels intact.
- B. Store materials in a protected area at a temperature range between 60°F. and 85°F.

#### 1.09 FIELD CONDITIONS

- A. Apply protective treatment to stainless steel and/or non-ferrous metal only under the following prevailing conditions:
  - 1. Air, surface and material temperatures are not below 60°F. or above 95°F.
  - 2. Prevent wide temperature variations, which might result in condensation forming on the freshly treated surfaces or could affect hydrolyzing or curing of the treatment.
  - 3. Avoid product mixing or installation when rain, heavy dew or fog conditions are imminent or could occur within 4 hours of treatment installation.
    - a. Protect all surfaces that have been properly cleaned from further contamination.
    - b. Mask or drop cloth adjacent surfaces not to receive protective treatment.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Steel Protective Treatment System: A clear anticorrosion protective treatments system for exterior use with stainless steel providing corrosion resistance under conditions simulated in accordance with ASTM B117.
- B. Subject to meeting the requirements, the following product may be used:
  - 1. Adsil MicroGuard® Advanced Siloxane Technology Stainless Steel & Non-Ferrous Metal Systemas manufactured by Microguard, Daytona Beach, FL, (386) 274-1382 or approved equal.
    - a. Cleaners and Conditioners
      - 1) MicroKleen™ PLC-1 Industrial Cleaner & Degreaser
      - 2) Acid Pickling/Passiveness Solution – Contractor Blended
      - 3) MicroKleen™ AD1-919 Isopropyl Alcohol 99% anhydrous
    - b. Protective Stainless and/or Non-Ferrous Metal Surface Treatment
      - 1) MicroGuard® AD95 Corrosion Protector Clear Treatment

### 2.02 MATERIAL PREPARATION

- A. Prepare and handle materials strictly in accordance with manufacturer's most current published technical literature.

## PART 3 - EXECUTION

### 3.01 PRE-WORK INSPECTION

- A. Examine stainless steel surfaces to be treated and report any conditions that would adversely affect the performance or appearance of the inorganic clear protective treatment system and which cannot be put into an acceptable condition by specified surface preparation methods.
- B. Do not proceed with the preparation, mixing or installation of the inorganic clear protective treatment until surfaces can be placed into an acceptable condition or authorization to proceed is granted.

### 3.02 SURFACE PREPARATION

- A. General Preparation

1. Preliminary to all surface preparation and application operations, completely mask, remove or otherwise adequately protect necessary adjacent surfaces, planting soil or plants to prevent damage.
2. Stage work and only prepare surfaces that can then be subsequently clear coated within the same day.
3. Prepare steel tube, framing and hardware surfaces only. Do not prepare or treat stainless steel wire mesh surfaces.

B. Preliminary Surface Cleaning

1. Completely flush the stainless surfaces with the specified MicroKleen PLC-1 Cleaner in accordance with the Manufacturer's written instructions. Allow the cleaner to set for several minutes before rinsing.
2. Using the pressure washer, liberally water-blast the surface with clean water. Rinse well past the phase when visual signs of "suds" have disappeared.
3. Control the cleaning material waste stream.
4. To provide means of diking or containment of material and collection of material for proper, legal disposal.

C. Specific Final Cleaning

1. Preliminary to installation of the MicroGuard® AD95, wipe the stainless surfaces with MicroKleen™ AD1-919 Isopropyl Alcohol (99% Anhydrous).
2. Lightly saturate a lint-free cotton cloth. If the cloth becomes quickly stained or soiled, continue cleaning with MicroKleen™ PLC-1 and re-rinse with water. Wipe with alcohol.

D. Pickling

1. Pickle the stainless steel surface with a topically applied nitric acid/hydrofluoric acid blend solution.
2. Rinse stainless steel surfaces well with clean water.
3. Apply clear protective coating immediately after pickling and rinsing and drying stainless steel surfaces.

3.03 APPLICATION OF INORGANIC CLEAR PROTECTIVE TREATMENT

- A. Strictly follow manufacturer's most current published product instructions detailing any product preparation, mixing, catalyzing or induction times, so as to provide the best quality work.
- B. All materials shall be applied under adequate illumination, evenly distributed and properly applied.
- C. All materials shall be applied in an even and continuous film, free from skips, holidays or pinholes onto properly prepared surfaces.
  1. Spray the Inorganic Clear Protective Treatment onto all areas to be protective treated at 1.0 to

2. 1.5 mils wet film thickness. Completely and uniformly wet the surfaces with product, allowing the treatment to migrate into all recess areas. It is important to achieve complete wetting of all surface areas to be protected, but free from runs. Take care to minimize skips or holidays. Inorganic Clear Protective Treatment will typically attract to bare stainless or aluminum metal.
3. Surfaces may also receive the Inorganic Clear Protective Treatment by installation with natural hair bristle brush or mohair staining/wiping pads. Apply product in thin and uniform film deposits. Take care to maintain a working wet line. Avoid over working the product.

#### 3.04 SITE CLEAN UP

- A. Any drips, spills or over spray of the Protective Treatment, should be cleaned up before the Inorganic Protective Treatment dries to touch.
- B. Remove all tarps, plastic sheeting, scaffolding, etc; following the application of the Inorganic Clear Protective Treatment.
- C. Remove debris from the job site and leave storage area clean.

#### 3.05 INSPECTION

- A. Inspect and repair all work that is not acceptable to the Landscape Architect and request the final acceptance.

#### 3.06 PROTECTIVE TREATMENT SCHEDULE

- A. As indicated on schedules
  1. Stainless Steel
    - a. Apply by spray, brush or pad - one coat of MicroGuard® AD95 Corrosion Protector Clear Treatment onto cleaned and properly prepared surfaces, per specification.

END OF SECTION 099800

**ATTACHMENT #7**  
**REVISED SPECIFICATION 313223 –**  
**JET GROUTING**

*(ATTACHED)*

## SECTION 313223 – JET GROUTING

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. The work of this Section consists of jet grouting that will be used in the flood protection system as a seepage barrier, gate foundation, and ground improvement. Be responsible for selecting jet grouting parameters, equipment, and construction methods to meet the requirements specified herein and indicated on the Contract Drawings. Detailing to construct the required elements or structures is by the CONTRACTOR.
- B. The work consists of providing all labor, equipment, materials, testing, and supplies necessary to design, furnish, and install the jet grouting to meet the specified performance requirements.
- C. Use jet grouting methods to install a soil-cement seepage barrier in areas indicated on the Contract Drawings to form a low-permeability (of no more hydraulic conductivity than the outlined value in the contract drawings), complete, and continuous soil-cement elements.
- D. BPCA will engage a third-party inspector to review and perform testing and is referred to herein as the AUTHORITY's QA Representative.
- E. Related Work Specified Elsewhere
  - 1. Section 017419 - Construction and Demolition Waste Management and Disposal.
  - 2. Section 018113 - Sustainable Design Requirements.

#### 1.02 DEFINITIONS

- A. Jet grouting consists of creating soil-cement in situ by jet grouting of a cementitious grout into the existing soil at a high pressure to increase the compressive strength of the subsurface soils and create a low-permeability barrier to reduce seepage beneath the flood gates and wall over the depths and limits shown on the Contract Drawings.
- B. In areas where grouting cannot be used due to buried obstructions and areas where mixing of soil would be detrimental to existing structures use flowable fill as specified in Section 312323.33 "*Flowable Fill*".

#### 1.03 REFERENCES

- A. Unless otherwise noted, the latest edition of the following codes and standards will govern this work. If any conflicts exist between these codes and standards the more stringent requirements will govern.

B. American Association of State Highway and Transportation Officials (AASHTO)

1. AASHTO M85: Standard Specification for Portland Cement
2. AASHTO M295: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
3. AASHTO T23: Standard Method of Test for Making and Curing Concrete Test Specimens in the Field
4. AASHTO T26: Standard Method of Test for Quality of Water to Be Used in Concrete
5. AASHTO T208: Standard Method of Test for Unconfined Compressive Strength of Cohesive Soil

C. American Petroleum Institute (API)

1. API 13A: Drilling Fluid Materials

D. American Society for Testing and Materials International (ASTM):

1. ASTM C150: Standard Specification for Portland Cement
2. ASTM C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
3. ASTM D5084: Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter
4. ASTM D6391: Standard Test Method for Field Measurement of Hydraulic Conductivity Using Borehole Infiltration requirements

1.04 PRICE AND PAYMENT PROCEDURES

- A. Payment: There is no additional payment for the work of this section.
- B. Provide a unit price for grouting at obstructions per cubic yard of grout column as described in Paragraph 1.08A.

1.05 SUBMITTALS

- A. Submit the following qualifications in accordance with Section 013300:
  1. Qualifications, and information regarding similar projects the entity performing the grouting and its superintendents has constructed, where jet grouting was utilized.
- B. Jet Grouting Equipment



1. Provide catalog cuts, details of grout mixers, pumps, drill rigs, and a plan view of the jet grout equipment arrangement proposed for use on this project, noting any equipment that has been modified or is of unique construction.
2. Examples of field data collection forms, including a sample copy of daily field report.

C. Grout Mix Design

1. Mix design for the project indicating sources and types of grout materials, including (if available) field test data from previous projects.
2. Method for verifying grout mix proportions.

D. Field Demonstration Test Program

1. Details of proposed field demonstration test program for jet grouting. This includes locations of test columns, layout of test pattern, jet grouting parameters to be used and variables to be tested during test program, methods for preventing settlement or heaving of the ground that could occur due to jet grouting operations in the vicinity of existing structures and utilities, and details of proposed quality control/quality assurance testing to meet acceptance criteria specified.
2. Settlement or heaving of the ground that could occur due jet grouting operations in the vicinity of the existing structures and utilities.

E. Grouting Procedure

1. Submit the following for approval by the CONSTRUCTION MANAGER prior to the start of jet grouting:
  - a. General Work Procedures Plan outlining the spacing, location, depth, and general sequence to achieve the specified criteria detailed in this specification. Dimensionally reference grout element locations to the Contract Drawings and show on layout plans of suitable scale to effectively indicate the details of the layout. If pre-drilling of jet grout holes is required, describe the methods and type of equipment to be used.
  - b. A general grout spoil return management plan outlining waste containment methods during grouting and treatment and removal plans for grout spoil return. Include estimated width of annulus for spoil return and corrective actions to be taken if spoil return is not free-flowing, interrupted or episodic.
  - c. Grouting site specific safety plan or job hazard analysis

- d. Contingency Plan - Methods and Details for the remediation of any condition where it is found that grout columns were not constructed to the required or planned dimensions, including diameter or length.
  - e. Alternate Grouting Layout Pattern - Provide an alternate jet grouting layout if drilling cannot proceed due to an obstruction, subject to the acceptance of the ENGINEER.
- F. Quality assurance, quality control and verification procedures to be used for the field test and production work.
  - 1. Closed Circuit Television (CCTV) Inspections in accordance with paragraph 3.03A
  - 2. Details of the procedures to obtain soil-cement samples; and catalog cuts or shop fabrication drawings of the soil-cement sampling device and curing boxes.
  - 3. Proposed details and formats of all required tabular and graphical data presentations that will be submitted to the ENGINEER during the course of the Work. This will include submittal of a copy of the reports used for data monitoring and recording.
  - 4. Details for hydraulic conductivity testing
  - 5. Details of column diameter and overlap verification
- G. Daily and Field Quality Control Reports
  - 1. Submit per requirements of Article 3.05. Submit a sample report form prior to commencing the work.

#### 1.06 QUALITY ASSURANCE

- A. Perform work in accordance with issued permits, New York City, Battery Park City Authority and the State of New York, ordinances, and regulations, in accordance with Section 014000.
- B. Qualifications
  - 1. The entity performing the jet grouting must be experienced in jet grouting operations comparable to that described herein and have at least 5 years of experience in jet grouting methods. Jet grouting experience will include at least 5 projects of similar magnitude and complexity to that required for the program specified herein.
  - 2. The jet grouting field superintendent(s) must have at least 5 years of experience in jet grouting techniques similar to that required for the Work, including at least 2 projects one of which occurred within the past 5 years of similar magnitude and complexity to that required for the Work.

## 1.07 DELIVERY, STORAGE AND HANDLING

### A. Containment, Collection, and Disposal of Spoil Return

1. At all times during jet grouting operations, keep the site clear of all debris and water. Pipe or channel spoil returns to tanks or other collection structures. Regularly dispose of all waste materials in accordance with the requirements of the DEP and all other agencies having jurisdiction.
2. All jet grout collection, containment, and disposal methods must be shown on the shop drawings. Be responsible for and incorporate all sedimentation and turbidity control measures required by applicable federal, state, and city regulations.
3. Take all necessary precautions and implement measures to prevent any spoil return, other spoil material or stockpiles materials from entering the storm drain structures, drainage courses, and other utility lines or from leaving the site via surface runoff. Prevent the migration of spoil return, spoil material, or stockpiled materials into any surface water body, beyond the immediate limits of jet grouting operations.

## 1.08 SITE CONDITIONS

### A. Obstructions

1. Subsurface strata may contain rubble, concrete, reinforced concrete slabs, timber piles, steel, bricks, stones, seawalls, abandoned foundations, utilities and other materials that can obstruct jet grouting operations. Where unknown obstructions are encountered during the jet grouting, remove the obstruction or install additional jet grout columns to encapsulate the obstruction, as directed by the ENGINEER.
2. If drilling for jet grouting cannot proceed due to an obstruction, the CONTRACTOR may elect to remove the object or submit an alternate jet grouting layout pattern to avoid or encapsulate the object, subject to the acceptance of the ENGINEER. Alternately, the CONTRACTOR may drill through the obstruction. Removal of the obstruction or drilling through the obstruction will be paid at the obstruction rate, while offsetting the column location will be paid at the standard rate for jet grouting in subsurface soils.
3. Each instance of obstruction will be resolved on a case-by-case basis. Payment will be based on an agreed upon unit rate for handling obstructions when the jet grouting cannot proceed. If such conditions are encountered, notify the ENGINEER in writing, and provide all pertinent information relating to the nature, depth, plan location coordinates, expected extent of the obstruction, and proposed procedures to overcome the obstruction.

## 1.09 SUSTAINABLE DESIGN REQUIREMENTS

- A. Sustainable Design Requirements: Implement practices and procedures to meet the Project's environmental performance goals, which include achieving ILFI Zero Carbon and WEDG Certification. Refer to Section 018113 - Sustainable Design Requirements for the Project's targets and specific requirements. Ensure that the requirements related to the Project's sustainability design goals are implemented to the fullest extent. Substitutions, or other changes to the work proposed will not be allowed if such changes compromise the Project's sustainability goals and ILFI Zero Carbon or WEDG certification, unless such substitutions or other changes are approved in writing by BPCA.

## PART 2 - PRODUCTS

### 2.01 MATERIALS.

- A. The jet grout slurry may consist of a homogeneous mixture of any of the following materials:
1. Cement, Portland, Type IL or II, ASTM C150 or AASHTO M85
  2. Ground granulated blast furnace slag: ASTM C989
  3. Fly ash Class C or F, ASTM C618 or AASHTO M295.
  4. Fly ash class to be utilized depends upon the required end product. Calcium content and loss-on-ignition properties to be considered for the fly ash that is being proposed.
  5. Potable Water or approved other source must be free of deleterious materials that may adversely affect the grout. If water is from sources other than recognized potable water suppliers, analyze the water in accordance with AASHTO T26, to ensure that it will have no adverse effect on the setting, hardening or durability of the mix and, where applicable, will not promote corrosion of the reinforcement.
  6. Bentonite, if required, powdered bentonite per API Standard 13A.
  7. Propose the ratios of the material components, by weight, confirmed during the preconstruction test program and approved by the ENGINEER. Once accepted, grout slurry composition must not be changed unless requested in writing by the CONTRACTOR and accepted in writing by the ENGINEER.
- B. Provide grout/soil mix with the following properties:
1. Unit Weight and Strength

Soil Type	Soilcrete Unit Weight (min.) PCF	Soilcrete Unconfined Compressive Strength (min.) PSI
Sand and Gravel	120	750
Silty Sand and Silt	120	750
Clay	100	400
Organic Silt	100	250

2. Permeability: As indicated on the Contract Drawings.

### PART 3 - EXECUTION

#### 3.01 EQUIPMENT

- A. All equipment used for drilling boreholes; lowering, raising, and rotating jet monitors; mixing grout; supplying pressurized grout and air-water to jet monitors; and jet monitors must have a proven performance records for use in jet grouting work, as demonstrated by the information to be submitted.
- B. Drilling Equipment
  1. Use drilling equipment of a type and capacity suitable for drilling required hole diameters and depths, and lowering, raising, and rotating jet grout monitors to the depths and at the rates required to perform the work as shown on the Contract Drawings and as specified herein. The drill rig must be equipped with automated controls to regulate and maintain consistent rod lift rate and rod RPM and must have pressure gauges and flow meters for all fluids injected.
  2. The drilling equipment must have specialty drilling bits capable of advancing through the site subsurface conditions including, but not limited to, concrete, brick, stones, timber piles, seawalls, cobbles, and boulders.
- C. Grout Mixing and Injection Equipment
  1. Jet Grouting
    - a. Use grout mixers and holding tanks, water tanks, air compressors, and pumps of sufficient capacity to ensure adequate supply of grout, air, and water at required pressure to the jet grouting monitors during a full work shift to produce grout elements of the quality and dimensions necessary.
    - b. Grout mixers must be high shear type and equipped with load cells to accurately weigh and proportion each component of the grout mix. Paddle type mixers must be utilized.

- c. For high grout volume demand, batch mixing may not produce sufficient supply and alternate mixing methods must be considered with evidence that quality is not compromised.

D. Grouting Pumps

1. Pumps must be capable, with the nozzles proposed, of providing the required pressure and flow rate adequate for the execution of the work.

E. Grout Tools

1. Use jet grouting monitors with appropriate nozzles with the capacity suitable for producing jet grout elements in the soil types identified during the preconstruction survey, and of the size and depth shown on the Contract Drawings and as specified herein. The drill hole diameter must be sufficiently large to be a clear path for continuous spoil return during all jetting operations.

F. Equipment Instrumentation

1. Provide instrumentation that allows continuous monitoring and automatic recording of data throughout the jet grouting operations. As a minimum, provide the following:
  - a. Pressure gauges/devices at the drilling rig to automatically record pressures of cement grout, water, and air during the grouting process.
  - b. Flow meter(s) to monitor and record the rate and total volume of grouting fluids through the grouting monitor at every element.
  - c. Devices that automatically monitor and record the rate of monitor rotation and withdrawal.

3.02 TEST PROGRAM

- A. Prior to production work, conduct a test program in accordance with the accepted work plan. Use the test program to optimize and verify the various parameters including type of jet-grouting (single), necessity of pre-jetting with water, grout mix composition, fluid(s) flows and pressures, rotational speed, lift rate, spoil return, grout, and number and size of nozzles; and confirm that the resultant in-situ soil-cement properties in paragraph 2.01B and the dimensions to meet required design criteria specified.
- B. The test program will be observed, reviewed, and verified for contract conformance by the ENGINEER and BPCA's QA Representative. Install the test program in areas near the planned production work at a location mutually agreed upon between the CONSTRUCTION MANAGER and CONTRACTOR and in representative soils and depths anticipated to be encountered during production work.

- C. Each test section must consist of a plan of elements suitable to demonstrate feasibility and feasibility of installation to the same elevations specified for the production jet grouting work.
- D. Expose the test elements by excavation (where possible) and measure for geometric properties. If full-depth excavation is not feasible, core samples or use other testing methods to demonstrate column size/geometry. In cases where excavation is not reasonable, use drill samples or other testing method to demonstrate column size/geometry.
- E. Perform hydraulic conductivity testing. Submit hydraulic conductivity testing procedures for approval.
- F. Submit the results of the test program and the recommended grouting parameters for the production work for approval. The CONTRACTOR, at their expense, may be required to repeat the construction of a test section if the results of the test program do not meet the project requirements. The test program must confirm that the resultant soil-cement properties met the required design criteria prior to proceeding with production work.

### 3.03 METHODS

- A. Commence jet grouting around existing DEP sewers that are to remain in-service only after the sewer has been inspected using a CCTV system to verify and record the existing conditions of the sewer at no additional cost to BPCA.
- B. Install jet grout columns using the same make and model of mixing machinery, cement grout mixing and pumping equipment, and the same materials and procedures for each method accepted in the test program.
- C. Single-fluid jet grouting is required. Double and triple fluid jet grouting methods are not allowed.
- D. Install jet grout columns in accordance with the approved patterns to achieve the compressive strengths and unit weights specified in paragraph 2.01B.1 and required plan area coverages over the depths and limits shown on the Contract Drawings. Where the jet grouting layout consists of overlapping jet grout columns, center-to-center spacing of jet grout elements must be as shown on the Contract Drawings and include an allowance for tolerable vertical alignment deviation as specified in paragraph 3.04.
- E. After final jet grouting, obtain samples of in-situ grout in accordance with the locations and frequencies specified in Article 3.05 Field Quality Control.
- F. Any jet grouted element, which exhibits partial or total instability, or which records indicate were not constructed in a manner to replicate test columns and agreed upon production jet grouting procedure must be remediated at no additional cost BPCA. Propose additional measures subject to the ENGINEER's approval to rectify such deficient jet grout columns.

- G. Once jet grouting is started at any location, continue the grouting until the soil-cement element is completed, refusal is reached, or bypass leakage is observed at the surface. If jet-grouting is interrupted during the installation of a column, re-start the jetting at least 1 foot below the stopping point. Refusal is defined as an average flow rate less than 0.01 gallons per minute over a 5-minute period.
- H. Do not install grout columns within 2 feet, as measured between outside edges of soil-cement elements, that are less than 48 hours old. The 48-hour delay may be shortened if **demonstrated** to the satisfaction of the ENGINEER that the installation of any adjacent columns would not have a deleterious effect on any previously installed soil-cement columns or the surrounding ground.
- I. Follow the approved Contingency Plan for the remediation of any condition where it is found that jet grout columns were not constructed to the required or planned dimensions, including diameter or length. This could occur due to the clogging of the equipment by the generated spoils. For such conditions, it might be necessary to install additional jet grout columns, or re-grout the locations and depths affected as directed by the ENGINEER. Perform all remediation work at no additional cost to BPCA.

#### 3.04 TOLERANCES

- A. The following horizontal and vertical alignment tolerances apply for the jet grouting:
  - 1. The maximum horizontal deviation of the as-installed center of any jet grout column at the ground surface installation level must not exceed 3 inches from the layout center coordinate, shown on the accepted submittal.
  - 2. The vertical alignment of the jet grout column (i.e., vertical columns) must not deviate more than 2% from vertical in any direction. Obtain vertical alignment profiles over the length of one soil- cement element per day, along two perpendicular axes as directed by the ENGINEER.
  - 3. The width of the columns shall be within  $\pm 1$  percent of the column width shown in the plans.
  - 4. Top of columns shall be at least (not lower than) the top elevation shown in the plans.
  - 5. Bottom of columns shall be no higher than the bottom elevation shown in the plans.
- B. At the direction of the ENGINEER, any jet grout column which exceeds the allowable horizontal or vertical tolerances must be re-mixed within two days of initial placement, or supplemented with one or more adjacent overlapping columns, at no additional cost to BPCA



- C. Minimum overlap thickness: Where the jet grouting layout consists of overlapping jet grout columns, spacing between jet grouting columns must be **as shown on the contract drawings** plus acceptable tolerances. Deviations must be less than required for minimum adequate column overlap of one (1) foot, zero (0) inches.

### 3.05 FIELD QUALITY CONTROL

#### A. Daily Reports

1. Within one business day of a work shift, submit summary daily reports during production jet grouting that provide the information listed below. Submit a sample of the report form proposed for use for approval prior to the start of work.
2. Daily reports must include the following:
  - a. Equipment and Personnel on site
  - b. Work initiated and completed
  - c. Production interruptions
  - d. Grouting Records
    - (1) Jet grout element number, size, and location.
    - (2) Time and date of beginning and completion of each grout element, including interruptions to the grouting process or material supply.
    - (3) Grout mix data, including mix proportions and unit weight density measurements.
    - (4) Injection pressure of all fluids used to construct each grout element.
    - (5) Flow rates of all fluids used to construct each grout element.
    - (6) Rotation rate and lift rate of jet rods for each grout element.
    - (7) Total grout quantity used for each element.
    - (8) Top and bottom elevations of the jet grout element.
    - (9) Whether flow of spoils return was continuous.
  - e. Total quantities of materials used for that day.
  - f. Observations of any unusual, or unanticipated conditions including obstructions, stoppages, loss of circulation, etc., impacts on instrumentation or monitoring.

3. Applicable verification testing or measurements done.
  4. Installation records, daily reports, and other project documentation must demonstrate that the selected parameters from the test program were accurately repeated for the production work.
  5. Provide continuous recording of jet grouting parameters for each production column to verify consistency with the test program result.
- B. Perform all jet grouting in the presence of BPCA's QA Representative. Notify BPCA's QA representative at least 72 hours prior to initiating jet grouting. Monitor and log jet grouting operations for both test areas and production work.
- C. Configure equipment to record and continuously show all fluid flows and pressures, rotational speed, depth, and rod lift rates. The rod lift rate and rod RPM must be set by the drifter then automatically controlled by the drill rig and automatically recorded on the jet grout installation logs during the entire jet grouting process. Provide the BPCA's QA Representative the means to monitor this information in real time in the field on request via equipment displays or computer station.
- D. Make all the data monitored and recorded available within one working day to the CONSTRUCTION MANAGER in a format agreed upon prior to the work. Supply the ENGINEER and BPCA's QA Representative with a license for the software used for this task. The software must be capable of processing the recorded data and presenting the data graphically.
- E. Measure grout mix proportions and document per the submittal requirements. Keep appropriate records and submit to verify that grout mixture(s) are as accepted. Include daily quantities of materials used in Daily Reports.
- F. Hydraulic Conductivity
1. Testing: Perform testing of production elements where the jet grouting is used as a seepage barrier at the rate of 5% of the installed columns. The number of test locations per grouting method will be proportional to the linear footage of each grouting method with a minimum of 2 test locations on columns constructed of each grouting method. Perform testing per ASTM D5084 or ASTM D6391.
  2. Acceptance: All of the tests performed must show hydraulic conductivity less than the maximum hydraulic conductivity specified on the Contract Drawings.
- G. Unconfined Compressive Strength of Jet Grout Soil Cement Mix
1. Wet Grab Soil-Cement Samples
    - a. Perform a minimum of one in-situ sampling round, consisting of 3 sampling depths with 4 samples from each depth daily, at locations and depths selected

by BPCA's QA Representative. Obtain the samples at the same element which consists of a non-cured soil-cement sample obtained at three depths. Obtain up to an additional wet grab sampling **test round per day** at the direction of BPCA's QA Representative, if required.

- b. Each retrieved soil-cement sample will be of sufficient volume to produce a minimum of four full cylinders, 6 inches diameter by 12 inches height. Separate and retain all soil-cement retrieved from each depth. **Different cylinder sample sizes may be acceptable should they fully comply with the relevant requirements set forth in the active version of AASHTO standard, to be approved by the ENGINEER.**
  - c. Protect soil-cement samples from freezing and extreme weather conditions which could have deleterious effect, at all times in accordance with AASHTO T 23.
  - d. Test soil-cement cylinders from each sampling depth to determine 7 day and 28-day unconfined compressive strength in accordance with AASHTO T 208. Test one cylinder, two cylinders at 28- days and hold one cylinder in reserve.
  - e. If all the required wet grab samples of the soil- cement cannot be obtained in the designated soil-cement element, obtain a full suite of wet grab samples from the next soil-cement installed by that rig.
2. Acceptance: At least 90 percent of all jet grout samples **tested per tested column** must have a minimum 28-day unconfined compressive strength as specified paragraph **2.01B.1**.

H. Uniformity:

1. Seven days after jet grouting operations are complete, perform continuous coring to full depth on 2% of production columns to obtain cores of the jet grouted soil. The cores will be evaluated by BPCA's QA Representative for compliance with specific acceptance criteria defined in this specification. The CONTRACTOR will be notified if the soil-cement samples do not meet the acceptance criteria outlined herein. Perform a number of test cores proportional to the linear footage of each grouting method with a minimum of 2 cores on columns constructed of each grouting method.
2. Take full-depth core samples to evaluate uniformity. Core using PQ-size triple core barrel with side discharge.
3. Calculate core recovery and percent treatment as follows

- a. Core recovery (expressed as a percentage) is equal to the total length of recovered core divided by the total core run length. Length of recovered core includes lengths of treated and untreated soil.
  - b. Percent treatment is calculated as the total length of recovered core minus the sum of the lengths of unmixed soil regions or lumps that extend across the entire diameter of the core divided by the total core run length expressed as a percentage.
4. Acceptance Criteria
- a. Recovery minimum 90%; Rock Quality Designation (RQD) minimum 50%
  - b. Uniformity is acceptable if percent treatment is at least 90% for every 5-foot core run. If the minimum percent treatment cannot be confirmed by coring in coarse sandy or gravelly soil, downhole camera/video can be used to confirm uniformity.
  - c. If using core runs shorter than 5 feet (e.g., 3 feet), then the recovery and percent treatment can be calculated by adding equal amounts of core run length on either side of the short core run length to make up a total 5-foot run length for calculation purposes.
  - d. Obtain vertical alignment profiles over the length of one soil-cement element per day, along two perpendicular axes as directed by the Engineer.

END OF SECTION 313223

**ATTACHMENT #8**  
**NEW SPECIFICATION –**  
**CON EDISON REQUIREMENTS FOR**  
**GAS AND ELECTRIC UTILITY WORK**

*(ATTACHED)*

*ASBESTOS ABATEMENT FOR CON EDISON FACILITIES IN THE COVERED AREA*

1. The existing Con Edison facilities in the Covered Area may contain asbestos. During the performance of the Contractor's excavation, if any presumed asbestos- containing material is identified, the Contractor shall notify Con Edison immediately and before commencing any asbestos abatement work.
2. Con Edison will coordinate and perform all required asbestos sampling and associated abatement work including disposal. The Contractor shall be responsible to pay for the costs for the work.

*GAS WORK IN THE COVERED AREA*

1. If the Contractor identifies any abandoned gas mains that interfere with the Project, Con Edison must expeditiously test and verify that the main is dead. In addition, Con Edison must conduct environmental tests to ensure that the main is environmentally safe, all of which will be paid for by the Contractor. The following procedure will be implemented:
  - a. The Contractor shall excavate and expose the abandoned gas main or give notice that we have no records of gas in the area.
  - b. Within seventy-two (72) hours of the Contractor notifying Con Edison that they have excavated and exposed the abandoned gas main, Con Edison shall test the main for gas and environmental hazards and verify that it is dead and safe to remove.
  - c. Once the gas main is verified dead and environmentally safe, Con Edison shall cut, cap, and remove any liquid from the gas main, and the Contractor shall remove and dispose of the gas main.
  - d. In the event the main is found to contain liquid and/or sludge, Con Edison will take a sample of the contents for testing. The testing will take approximately forty-eight (48) to ninety-six (96) hours and will determine if the samples contain environmental hazards.
  - e. If the results indicate that the main is contaminated, Con Edison shall promptly establish the procedure required to remediate the gas main. The gas main **MUST** be remediated by Con Edison prior to cutting and removing. Con Edison will be allowed full unrestricted access for a period of 10 working days to remediate any contaminants that are found within existing gas mains or gas main sleeves.
  - f. If the affected main is within the Covered Area, it is recommended that the Contractor dig a test pit to expose for testing the main prior to the Project start. This would avoid any delays in the event the gas main is found to be contaminated.
2. If a live cast iron gas main is undermined or if the main falls in the angle of repose, it shall be replaced in accordance with the requirements of the applicable statutory regulations and the following procedure:
  - a. The main will be tied into acceptable pipe, as determined by Con Edison in its sole discretion, and the excavation will be extended a maximum of 20 feet at both tie-in areas. The cost for this replacement work will be borne by the Contractor. The work can only be performed by an approved Con Edison contractor.

- b. In the event the excavation needs to be extended beyond these limits, as determined by Con Edison in its sole discretion, a specialty contractor chosen and hired by Con Edison will perform this additional replacement work, the cost of which will be borne by Con Edison.
3. The Contractor will perform test pits as needed to verify the location of all gas mains. The cost for this work will be borne by the Contractor. Con Edison will be given seventy-two (72) hours' notice of the date and time the test pits will be performed, and Con Edison will have a representative present for the testing.
4. Refer to the schematic gas relocation plan (see RFP Exhibit B-2 – Supporting Documents) for work near the Brooklyn Battery Tunnel. Layouts for the relocation of the 12" low pressure gas main and 12" high pressure gas main shall be provided by Con Edison based on test pit information that the Contractor shall provide to Con Edison at the start of construction. If any gas mains are uncovered by the Contractor that are not shown on Con Edison's plates, the Contractor must notify Con Edison. If Con Edison deems replacement/relocation of the gas main is necessary, the Contractor shall provide test pit information for Con Edison to prepare additional layouts. Gas work can only be performed by an approved Con Edison contractor that is covered.
5. If any portion(s) of a gas main must be replaced for any reason (except if due to the negligence of Con Edison or any third party, with the exception of the Contractor), the Contractor will be responsible for all associated costs for the replacement of such portion(s) of the main and all the costs associated with any additional delays to the Project. If any portion(s) of a gas main must be replaced solely because of the negligence of Con Edison or a third party (other than the Contractor), Con Edison shall be responsible for all associated costs for the replacement of such portion(s) of the main and reserves the right to have its own contractor perform such replacement work. Con Edison will not be liable for any costs for associated delays to the Contractor's Project work schedule, but Con Edison acknowledges that time is of the essence with respect to the performance of its obligations under this agreement and will use best efforts to avoid delay to the contracts.
6. Regarding the work for parallel conveyance (NSI) work:
  - Exact location of Con Edison facilities will be determined by the Contractor during construction. Contractor shall perform test pits at the start of construction and provide to Con Edison to determine if relocations are necessary and in order to prepare layouts accordingly.
  - Con Edison gas plates indicate possible PCB in abandoned pipes in West Street. If the Contractor encounters material that is contaminated or hazardous, the cost of removing, handling, trucking, storing and disposing is at the Contractor's expense.
  - Contractor to immediately notify Con Edison if a gas main (live or abandoned) is uncovered in West Street.
7. Contractor to provide penetration details and material specifications at all locations where existing/proposed gas mains penetrate through or under flood protection foundations to Con Edison Engineering for review and concurrence (72) business hours prior to construction.

**ELECTRIC WORK IN THE COVERED AREA**

1. Where feasible the Contractor shall maintain and support in place iron, steel, precast concrete pipe and/or any other type of material conduits during Project- related construction work in the Covered Area. Con Edison will review the field conditions to determine the appropriate supports, or, if any such conduits cannot be supported, the necessary replacements. Con Edison will consult with and allow the Contractor to participate in such review process.
2. The Contractor may remove electrical conduits after consultation with Con Edison prior to any removal. In connection with this work, the Contractor shall support the cables in temporary, fireproof, wooden boxes partitioned to provide separation of cables similar to existing separation. It may be necessary for the Contractor to place cables in separate boxes. In addition, the Contractor shall wrap cables in fireproof tape, and shall provide empty troughs to pull new cable in case of burn out. All cable installed on this Project shall be spliced into the existing system as per Con Edison's latest specifications at the sole expense of the Contractor.
3. Restoration of conduits shall include the replacement of all electrical ducts that were broken out and temporarily supported within the limits of the excavation.
4. All new conduits shall be from structure to structure and will be installed and paid for by the Contractor. Any associated new cable that must be installed, including extra slack at locations, will be installed and spliced by Con Edison and paid for by the Contractor.
5. The nominal cover for electric conduits and duct banks shall be 24". Where cover over conduits is less than 24", the conduits shall be protected by 3/8" steel plates, placed at a minimum of 4" above the duct, with 2" overlap of plate sections and projecting 2" beyond the width of the duct on each side.
6. Primary and secondary cables must be racked separately in temporary manholes. Primary and secondary cables in conduits, which have been broken out, must be maintained in separate fireproof wooden troughs.
7. Where existing electrical boxes or manholes are to be replaced, the Contractor shall break out and remove the existing box/manhole and break out the conduits entering the box while supporting and maintaining live cables. The new box/manhole shall be built around the existing live cables.
8. If Con Edison determines that existing conduits contain dead cables, the Contractor may (in the Contractor's discretion) abandon or remove the conduits, to the extent that they interfere with the new utility construction. Cable removal shall be done by Con Edison. Any material removed by the Contractor shall be deemed property of BPCA, with the exception of cable.
9. The Contractor shall not damage or excessively pull on the electric cables during construction. Any damage to the cables or to the racking system caused by the Contractor or its contractors shall be replaced by Con Edison at the Contractor's expense.



10. Materials purchased by the Contractor shall adhere to Con Edison's material specifications and shall be obtained from a Con Edison approved vendor. Copies of the specifications and approved vendor list will be provided to the Contractor upon request. If the excavation uncovers Con Edison facilities that are found to be in interference with proposed the Contractor work or temporary supports and must be relocated for the Contractor's work to continue, any relocation work to lower, raise, relocate, or remove the interference will be the responsibility of the Contractor. All required work will be at no cost to Con Edison.
11. Any manholes, boxes, conduit, or steel pipe damaged or broken out by the Contractor that are not indicated as part of the scope on the Contract drawings will be replaced or repaired and new cable installed at no cost to Con Edison.
12. Any existing Con Edison vault or structure damaged by the Contractor in connection with the work and not caused by the fault of Con Edison or a third party (other than the Contractor's contractor or subcontractor) shall be replaced and/or repaired by the Contractor at no cost to Con Edison.
13. Prior to the start of the Utility Work being performed under this agreement, a joint meeting shall be held in the field with representatives from Con Edison, BPCA, and the contractor to verify information shown on the design plans.
14. The Contractor will perform test pits as needed to verify the location of all electric facilities. The cost for this work will be borne by the Contractor. Con Edison will be given seventy-two (72) hours' notice of the date and time the test pits will be performed, and Con Edison will have a representative present.
15. Refer to the schematic electric relocation plan (see RFP Exhibit B-2 – Supporting Documents) for work near the Brooklyn Battery Tunnel. Contractor to perform test pits at the start of construction to locate existing Con Edison facilities and provide to Con Edison. Con Edison will then prepare layouts for the relocation of primary and secondary electric conduits, and manholes/service boxes for the Contractor's use. Conductor (cable) layouts will also be prepared for Con Edison forces.
16. Regarding the addendum for parallel conveyance (NSI) work:
  - Exact location of Con Edison facilities will be determined by the Contractor during construction. Contractor shall perform test pits at the start of construction and provide to Con Edison to determine if relocations are necessary and in order to prepare layouts accordingly.
17. Contractor to provide penetration details and material specifications at all locations where existing/proposed electric facilities penetrate through or under flood protection foundations to Con Edison Engineering for review and concurrence (72) business hours prior to construction.