



**Pier 26 Upland Park Construction – Electrical Construction
Project/Contract #C4891-C
Addendum # 4
December 3, 2018**

To All Respondents:

- 1. Part I, Section 2.2.6.3 of the above referenced RFP contained in the Project Manual is hereby as follow:**

“2.2.6.3 Submission Deadline:

- (i) Friday, December 14, 2018**
- (ii) Time: 5:00 pm”**

- 2. Part III, Appendix D, Section i(3) is hereby amended and restated as follows:**

“(3) Workers Compensation, Employers Liability and Disability Benefits Insurance and US Long Shore & Harbor Workers’ Compensation Act.

- A. Worker’s Compensation and Employer’s Liability and Disability Benefits.** *Insurance shall be provided in statutory amounts as applicable to the Contractor’s operations.*
- a. Proof of Workers Compensation coverage must be presented on the NYS WCB C-105.2 or equivalent form; proof of Disability coverage must be provided on a DB-120.1 form.*
 - b. The NY State Workers Compensation Board guideline regarding these requirements is available at:
<http://www.wcb.ny.gov/content/main/forms/AllForms.jsp>*
 - c. If Exempt from Worker Compensation please refer to the following link and provide proof on the CE200 form issues by the NY State Workers Compensation Board:
http://www.wcb.ny.gov/content/ebiz/wc_db_exemptions/requestExemptionOverview.jsp*
 - d. If the Contractor is not a NY State based business, then the Contractor must provide a copy of its Workers’ Compensation policy’s Declarations Page to show that New York is listed in Part 3A and to confirm the policy provides statutory Employer’s Liability coverage applicable in NYS.*
- B. US Long Shore & Harbor Workers’ Compensation Act.** *If the Contractor or it subcontractors work involves floating equipment, barges or floats, or*

performs marine-related construction, the Contractor, and/or as applicable, its subcontractors, shall purchase and maintain additional US Long Shore & Harbor Workers' insurance in statutory amounts."

3. Attachment A of the RFP contained in the Project Manual is hereby amended as follows and as specifically set forth in Attachment 1 herein:

(A) "1. C4891 –A-E Pier 26 Upland Park Construction" is amended to include the following drawing modifications:

Drawing	Update
L-210-DECK SUBSLAB LAYOUT&GRADING PLAN - PIER A	Topping slab description clarified.
L-230-PAVING& DECKING PLAN- PIER A	Legend corrected to say inlaid finish, instead of sandblast inlaid finish.
L-231 - PAVING & DECKING PLAN - PIER B	Legend corrected to say inlaid finish, instead of sandblast inlaid finish.
L-232 - PAVING & DECKING PLAN - PIER C	Legend corrected to say inlaid finish, instead of sandblast inlaid finish.
L-233 - PAVING & DECKING PLAN - PIER D	Legend corrected to say inlaid finish, instead of sandblast inlaid finish.
L-234 - PAVING & DECKING PLAN - NORTH UPLAND	Legend corrected to say inlaid finish, instead of sandblast inlaid finish.
L-243 - PAVING MODULES	The unique shell inlay material has been removed.
L-400 - GRADING PLAN - PIER A	Symbol for slot drain and trench drain has increased visibility.
L-401 - GRADING PLAN - PIER B	Symbol for slot drain and trench drain has increased visibility.

L-402 - GRADING PLAN - PIER C	Symbol for slot drain and trench drain has increased visibility.
L-403 - GRADING PLAN - PIER D	Symbol for slot drain and trench drain has increased visibility.
L-404 - GRADING PLAN - NORTH UPLAND	Symbol for slot drain and trench drain has increased visibility.
S-301 - FRAMING PLAN - PIER B	Walkway south of seating terrace no longer called out as 8" concrete seating step.
S-302 - FRAMING PLAN - PIER C	The thickness of the concrete is correctly labeled to show the 8" depth only at the 15' wide southern, as in the materials plans.
E-301 - ELECTRICAL PLAN - PIER B	Location of Q-vault shown.
E-302-ELECTRICAL PLAN - PIER C	Electrical clarification to sport pole.
E-308 - WOOD AND STEEL SHED ELECTRICAL DETAILS.pdf	New sheet showing clarifications of electrical work at the sheds.
P-303 - SANITARY PIPING PLAN - PIER D	Cross section of piping added.
P-312 - SANITARY PIPING PLAN - PIER C	Clarification to boat service utilities.

(B) "4. C4981-C Electrical Construction – Specifications" is amended to include the following specification modifications:

Specification	Update
Section 02870 Site Furnishings	- Quantity of umbrella canopy fabrics was increased.

	- Basis of Design clarified in parts 2.2, 2.3, 2.4, 2.5, 2.7 and 2.8.
Section 02300 Earthwork	Geofoam density clarified.
Section 02751 Cement Concrete Paving	Language updated to say only use epoxy coated reinforcing.
Section 02087 Ductile Iron Sewer Pipe	Sewer pipe has been re-specified.

4. All requirements of the original RFP shall remain in full force and effect, except as set forth in this Addendum and any other previously issued Addenda.
5. All capitalized terms set forth in this Addendum shall have the same meaning as set forth in the RFP being amended hereby.

THIS ADDENDUM MUST BE SIGNED BY THE PROPOSER AND ATTACHED TO THE TECHNICAL PROPOSAL WHEN SUBMITTED.

HUDSON RIVER PARK TRUST

By: Kevin Quinn

Title: Senior Vice President

ACKNOWLEDGED AND AGREED:

Name of Proposer: _____

By: _____

Title: _____

Date: _____

ATTACHMENT 1

AMENDED ATTACHMENT A DOCUMENTS

(A) 1. C4891 A-E_Pier_26_Upland_Park_Construction_Addendum4.PDF

MATCHLINE:
SEE E-301

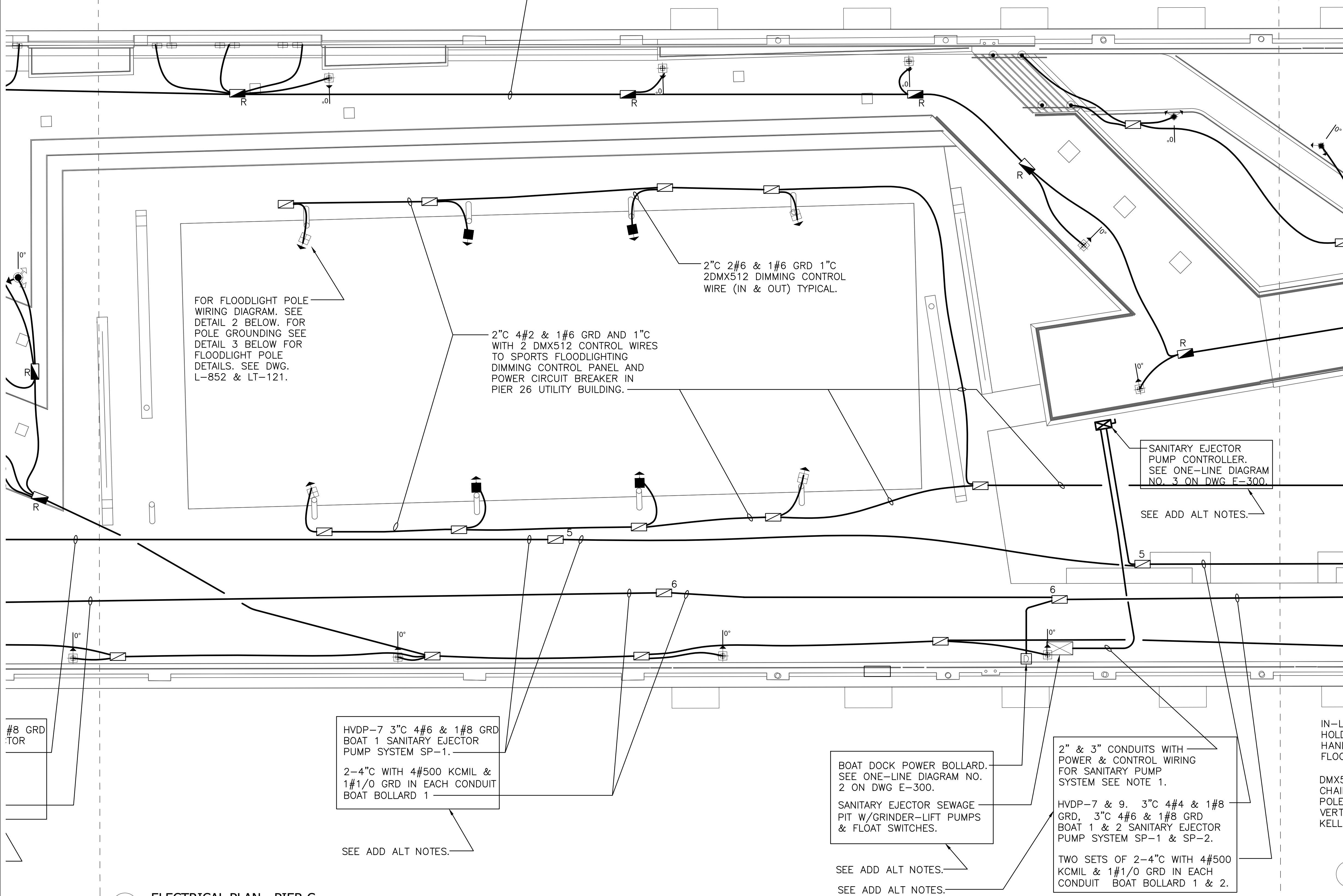
MATCHLINE:
SEE E-302

MATCHLINE:
SEE E-302

MATCHLINE:
SEE E-303

OTE DRIVER FOR
12. REFER TO
3S & SPECS FOR
REQUIRE REMOTE

CONDUIT & WIRE BELOW WOOD
WALKWAY MOUNTED TO THE WALKWAY
STRUCTURE & SUPPORTED 6'-0" ON
CENTER TYPICAL FOR ALL CONDUITS
TO AND FROM RECESSED PULLBOXES.



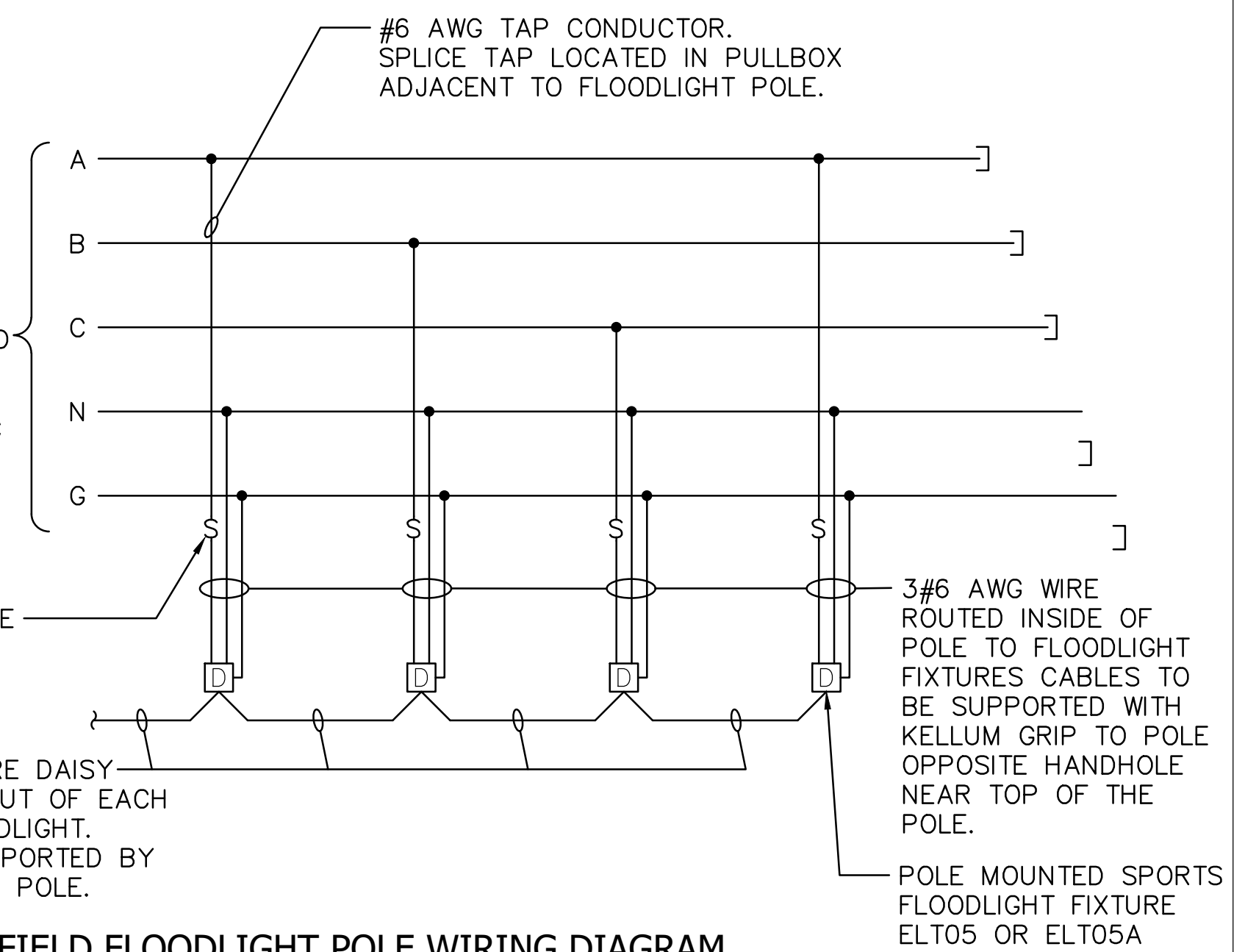
1 ELECTRICAL PLAN - PIER C

Scale: 1"=10'-0"

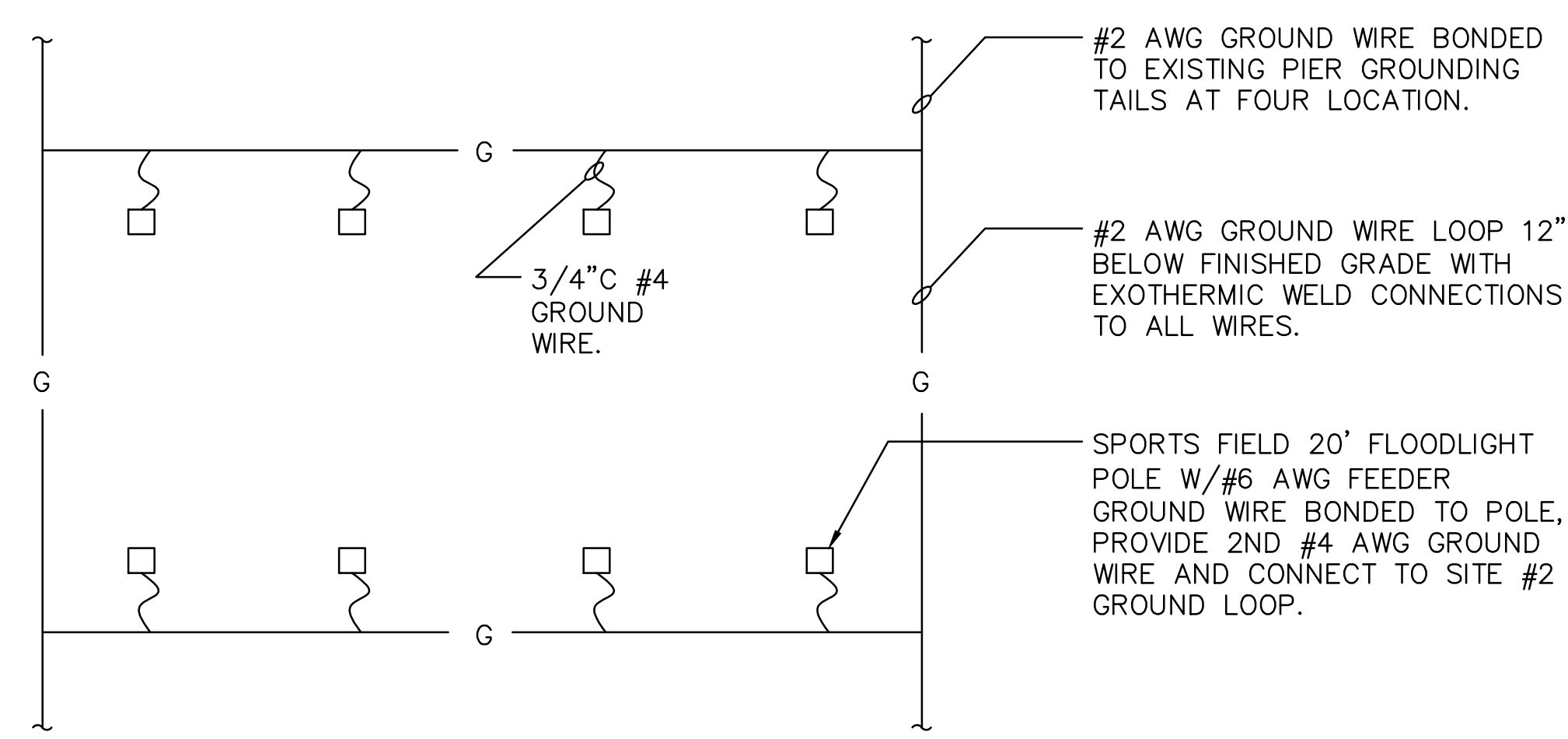
LEGEND:

- ELECTRICAL CONDUIT & WIRE
- 200A SAFETY DISCONNECT SWITCH TYPE HD (HEAVY DUTY) FUSE SIZE: 200A = FUSE SIZE ENCLOSURE TO BE NEMA 12, UNLESS OTHERWISE NOTED
- ⊠ SANITARY EJECTOR PUMP CONTROLLER & MOTOR STARTERS NEMA 4X STAINLESS STEEL ENCLOSURE (TYP.)
- ⊞ MOTOR - 3 HORSEPOWER
- CIRCUIT BREAKER
- MH-X EXISTING MANHOLE X INDICATES MANHOLE NUMBER
- R PULL BOX RECESSED MOUNTED BELOW DECKING SEE NOTE 6
- ⊞ 5 CONCRETE PULLBOX WITH CAST IRON ROADWAY FRAME & COVER SIZE 24"x18" UNLESS OTHERWISE NOTED 5 = 36"x24" SIZE 6 = 48"x24" SIZE

NOTE:
1. SANITARY PUMP WIRING TO HAVE NO SPLICES WITHIN PUMP PIT. FLOAT & PUMP POWER WIRING TO BE LONG ENOUGH TO REACH CONTROLLER WITHOUT ANY SPLICES. COORDINATE CORD LENGTHS WITH PUMP & FLOAT MANUFACTURERS.

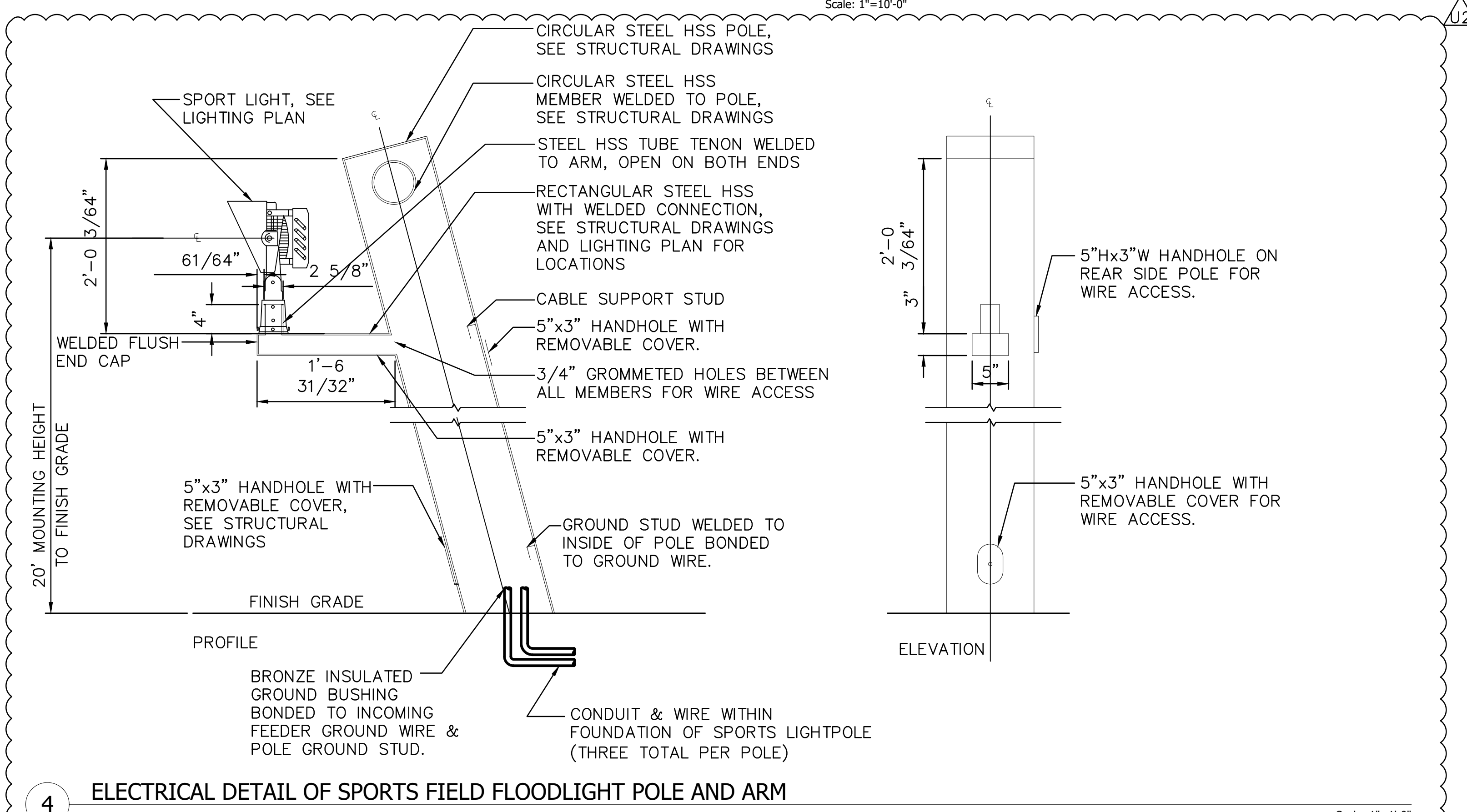


Scale: N.T.S.



3 SPORTS FIELD FLOODLIGHTING POLE GROUND PLAN

Scale: N.T.S.



4 ELECTRICAL DETAIL OF SPORTS FIELD FLOODLIGHT POLE AND ARM

Scale: 1"=1'-0"

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New York State Department of
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Segment 3

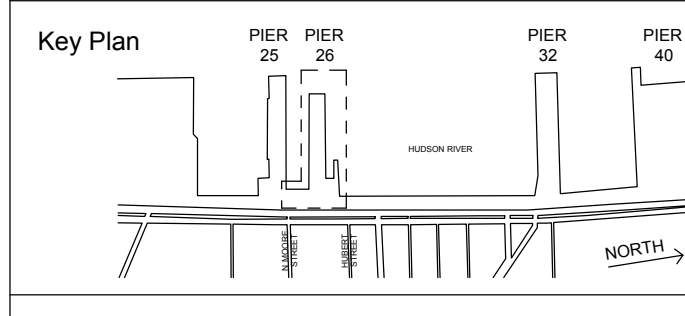
PIER 26 UPLAND PARK CONSTRUCTION

C4891 - A-E

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- Structural Engineer:
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- Marine Engineer:
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North Haven, CT 06473
203.259.2710

No.	Date	Description
	09/28/2018	ISSUED FOR BID
U1	11/02/2018	ADDENDUM 1
U2	11/30/2018	ADDENDUM 2



ELECTRICAL PLAN - PIER C

Scale: 1" = 10'-0"

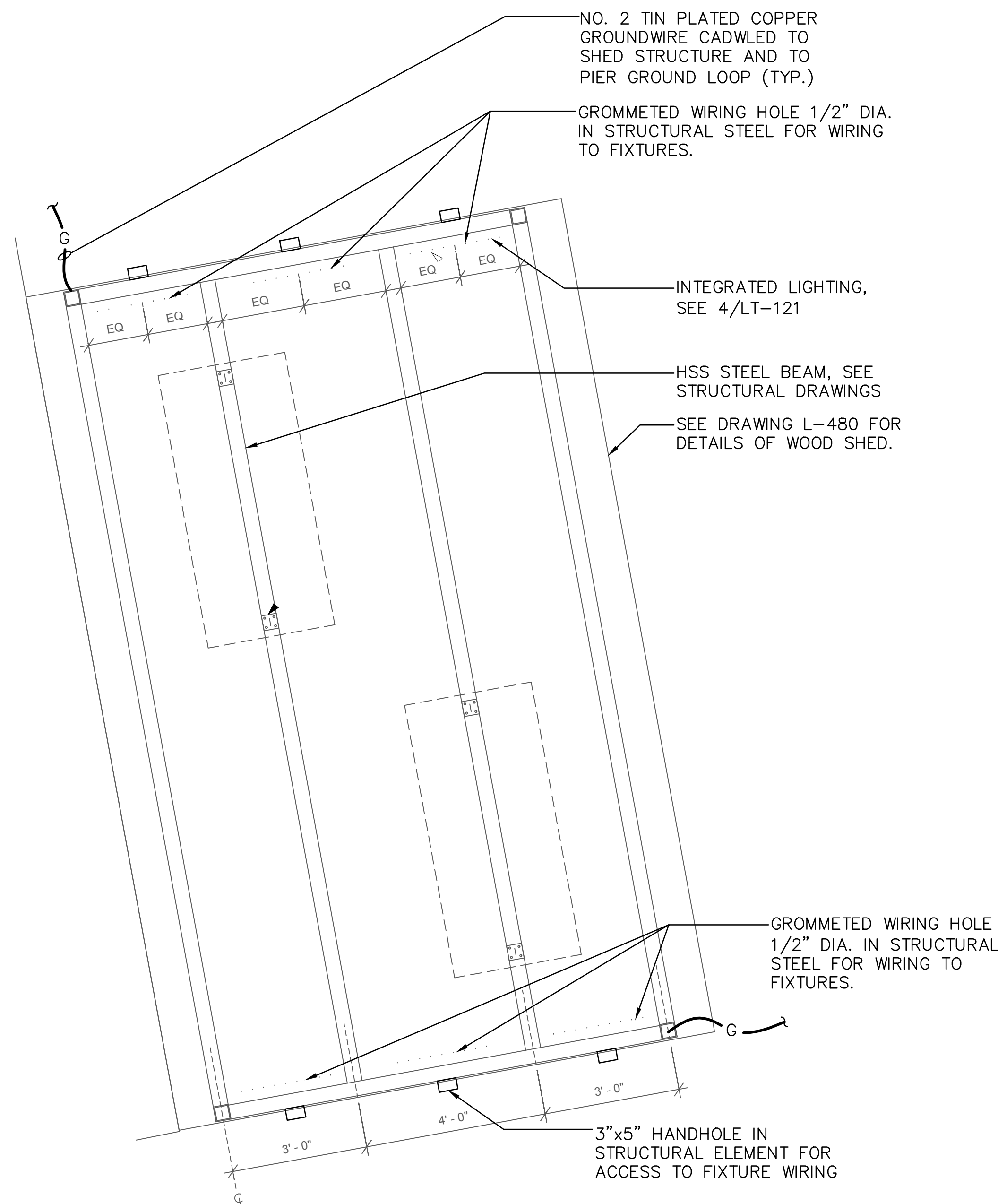
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Drawn: JR/MA

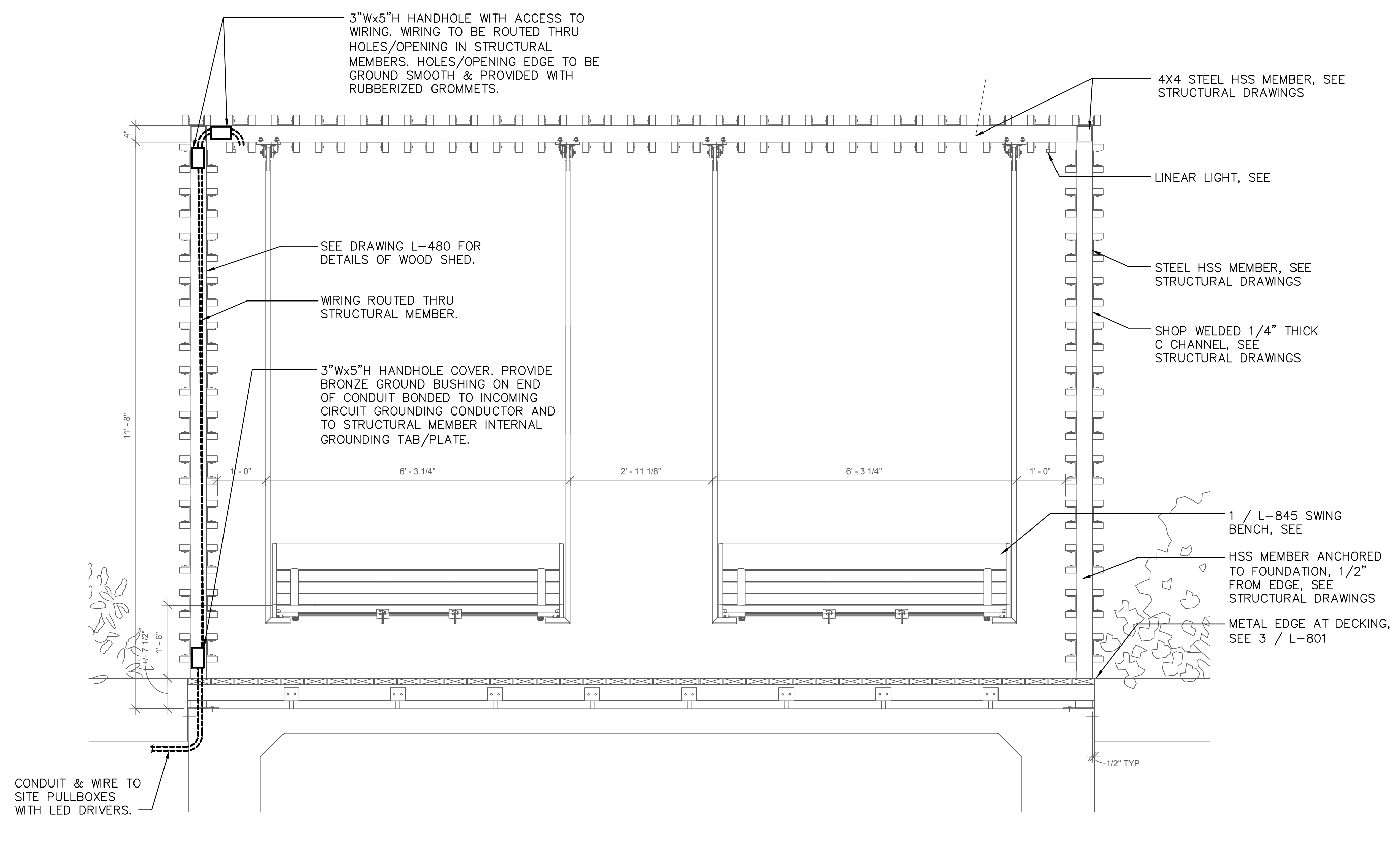
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Project No.: 1527

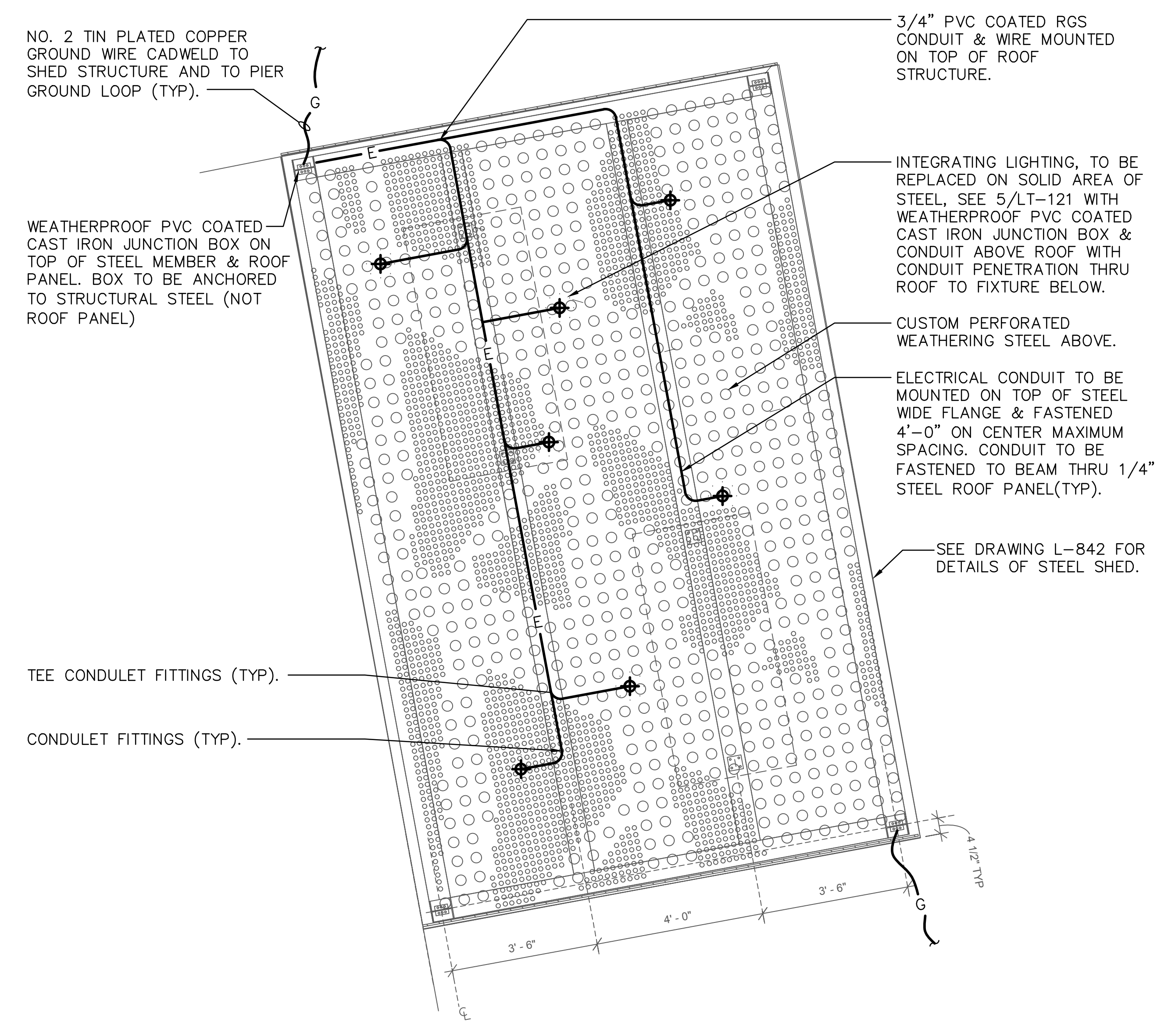
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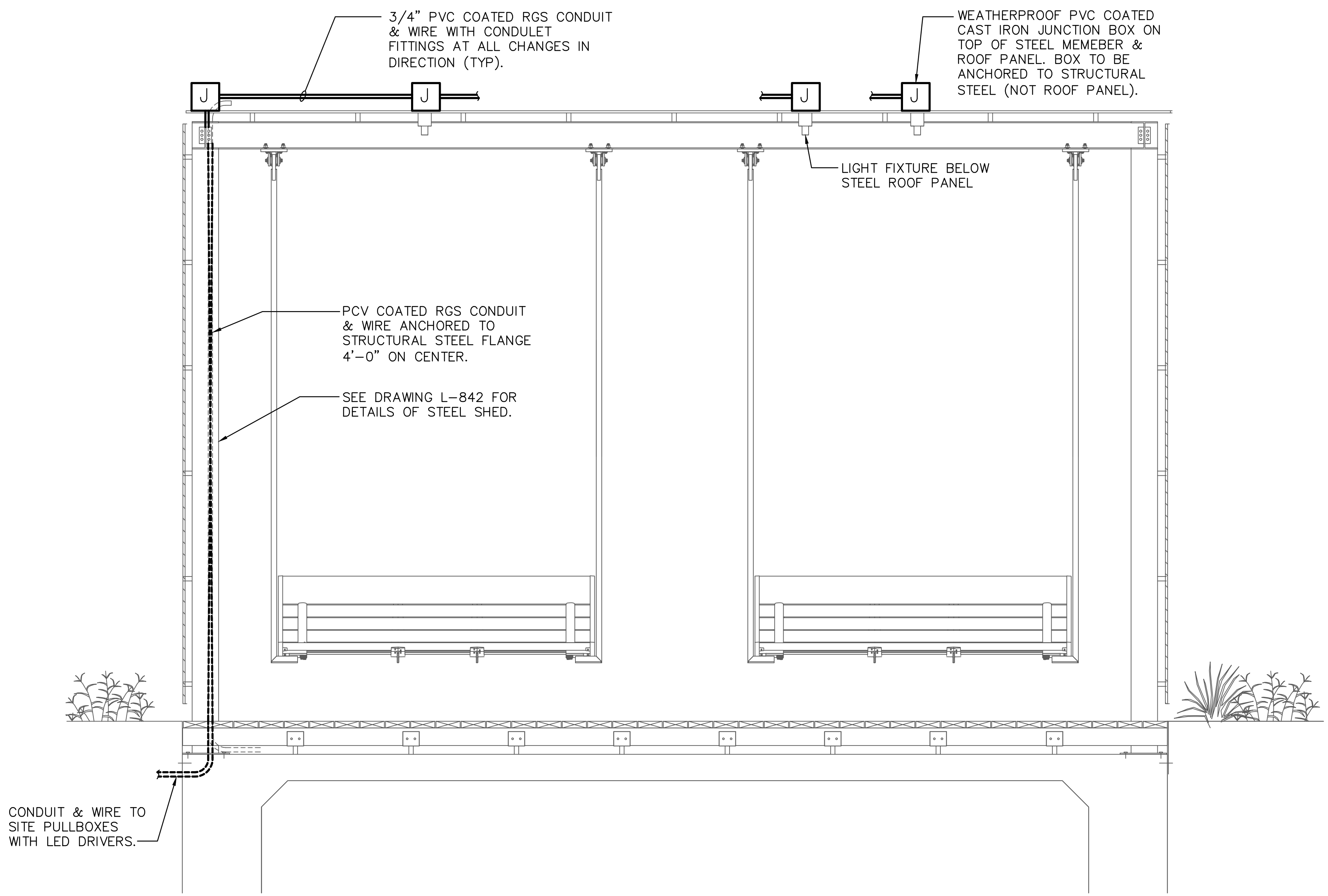
1 WOOD SHED ROOF LIGHTING PLAN
Scale: 1/2" = 1'-0"




2 WOOD SHED ELECTRICAL SECTION
Scale: 3/4" = 1'-0"



3 STEEL SHED ROOF LIGHTING PLAN
Scale: 1/2" = 1'-0"



4 STEEL SHED ELECTRICAL SECTION
Scale: 3/4" = 1'-0"


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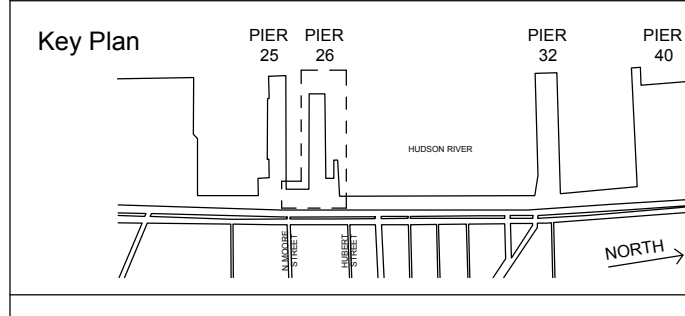
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Seal

No.	Date	Description
U2	11/30/2018	ADDENDUM 2 - NEW DRAWING



WOOD AND STEEL SHED ELECTRICAL DETAILS

Scale: As Indicated
Date: 09/28/2018
Drawn: JR/MA
Checked: BA
Project No.: 1527



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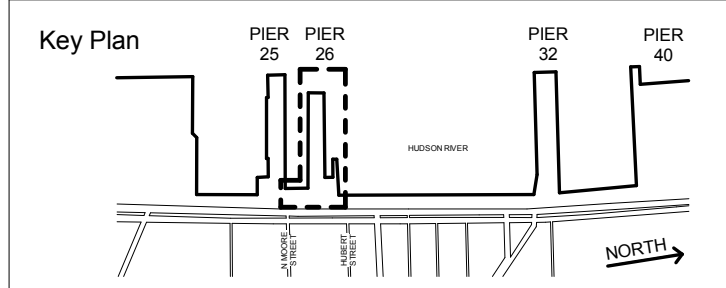
Lighting Designer:
TILLET LIGHTING DESIGN, Inc.
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Seal

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U1	11/02/2018	ADDENDUM 1
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DECK SUBSLAB LAYOUT & GRADING PLAN - PIER A

Scale: 1" = 10'-0"
Date: 09/28/2018
Drawn: JK
Checked: DS
Project No.: 1527

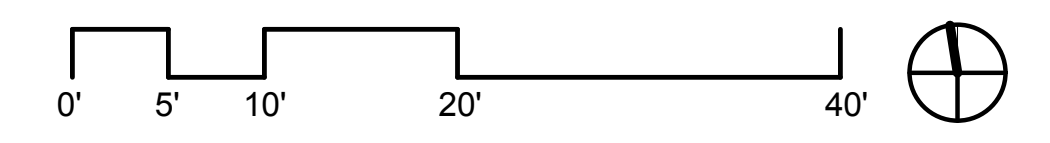
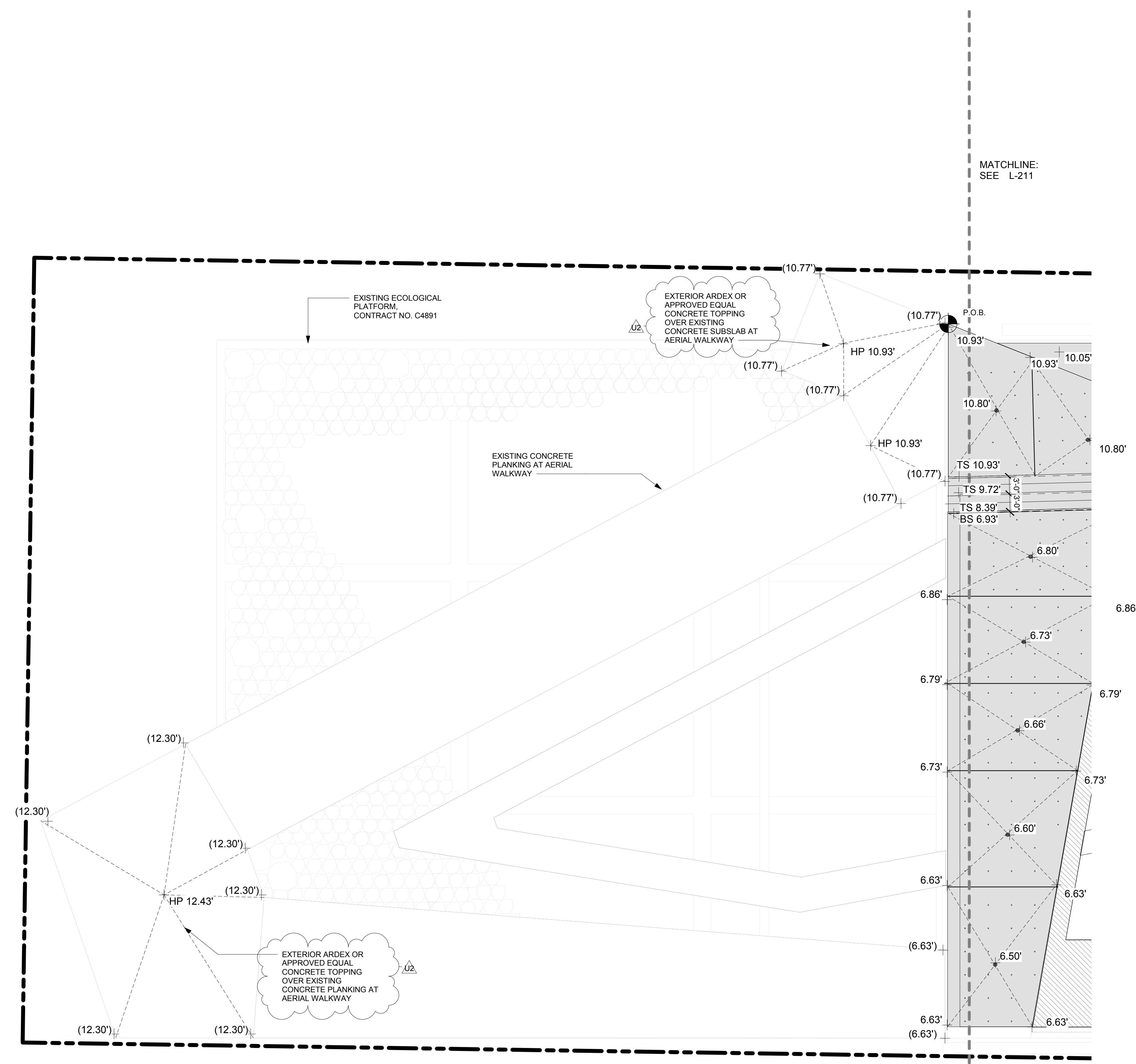
L-210.00

LEGEND

- LIMIT OF WORK
- CONCRETE FOUNDATION / SUBSLAB, SEE STRUCTURAL DRAWINGS
- CONCRETE FINISH PAVING, SEE L-230 SERIES
- POINT OF BEGINNING (POB)
- CENTERLINE
- DIA
- EQ
- OC
- VIF
- RIDGE / VALLEY
- FINISHED DECKING ABOVE
- EXPANSION JOINT
- AD
- SD
- TD
- + XXX.XX
- + (XXX.XX)
- X%
- TW
- BW
- TS
- BS
- FG
- CONCRETE CORE

NOTES

1. DO NOT SCALE DRAWINGS.
2. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND LAYOUT DIMENSIONS IN THE FIELD AND REPORT ANY DISCREPANCIES TO LANDSCAPE ARCHITECT FOR DECISION PRIOR TO STARTING CONSTRUCTION.
3. CONTRACTOR SHALL CONTACT THE LANDSCAPE ARCHITECT IF THERE IS ANY CONFLICT BETWEEN THE COORDINATE POINTS AND DIMENSIONS WHEN LAYING OUT IN THE FIELD.
4. CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF BELOW GRADE UTILITY STRUCTURES DURING SITE LAYOUT AND REPORT ANY DISCREPANCIES BETWEEN FOOTINGS AND EXISTING BELOW-GRADE STRUCTURES TO LANDSCAPE ARCHITECT FOR DECISION PRIOR TO STARTING CONSTRUCTION.
5. CONTRACTOR SHALL STAKE OR FLAG ALL SITE ELEMENTS TO BE CONSTRUCTED IN THE FIELD FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION.
6. ALL ANGLES ARE ASSUMED TO BE 90 DEGREES UNLESS OTHERWISE STATED.
7. ALL DIMENSIONS ARE TO FACE OF CURB, WALL OR BUILDING UNLESS OTHERWISE STATED.
8. FOR EXISTING CONTROL POINTS, SEE TOPOGRAPHIC SURVEY ON SHEET V-202.
9. CONTRACTOR SHALL VERIFY ALL EXISTING GRADES IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE LANDSCAPE ARCHITECT BEFORE CONSTRUCTION.
10. ALL LINES AND GRADE WORK NOT PRESENTLY ESTABLISHED AT THE SITE SHALL BE LAID OUT BY A REGISTERED LAND SURVEYOR OR PROFESSIONAL CIVIL ENGINEER EMPLOYED BY THE CONTRACTOR IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. CONTRACTOR SHALL ESTABLISH PERMANENT BENCHMARKS AND BOUNDS AND REPLACE ANY WHICH ARE DESTROYED OR DISTURBED.
11. THE WORDS "FINISHED GRADE" (F.G.) SHALL MEAN THE REQUIRED FINAL GRADE ELEVATIONS INDICATED ON THE DRAWINGS.
12. SPOT ELEVATIONS SHALL GOVERN OVER PROPOSED CONTOURS.
13. CONTRACTOR SHALL ENSURE CONSISTENT SLOPE BETWEEN SPOT ELEVATIONS.
14. AT RIDGE LINES, HIGH POINTS AND LOW POINTS, CONTRACTOR SHALL TRANSITION GRADE TO AVOID A POINT OR SHARP EDGE.
15. ALL WORK PERFORMED IN A PUBLIC RIGHT-OF-WAY SHALL MEET THE REQUIREMENTS OF THE LOCAL MUNICIPALITY.
16. CONTRACTOR SHALL NOT PERFORM WORK OUTSIDE THE DESIGNATED SITE BOUNDARY. IF FIELD CONDITIONS WARRANT OFF-SITE GRADING, PERMISSION SHALL BE OBTAINED BY CONTRACTOR FROM THE AFFECTED PROPERTY OWNERS.
17. ALL SIDEWALKS, TERRACES, FOUNDATIONS AND OTHER PAVED AREAS SHALL SLOPE TO DRAIN AT .05% MIN.





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HUDSON RIVER PARK

Segment 3

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C4891 - A-E

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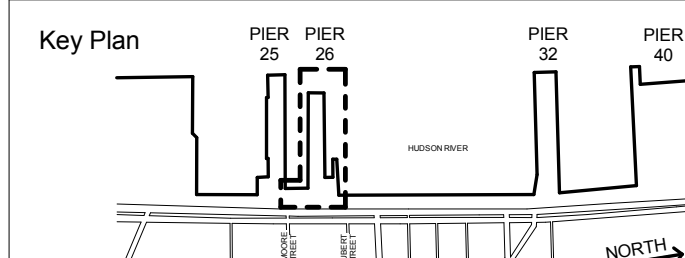
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Seal

No.	Date	Description
	09/28/2018	ISSUED FOR BID
U2	11/30/2018	ADDENDUM 2



PAVING & DECKING PLAN - PIER A

Scale: 1" = 10'-0"
Date: 09/28/2018
Drawn: JK
Checked: DS
Project No.: 1527

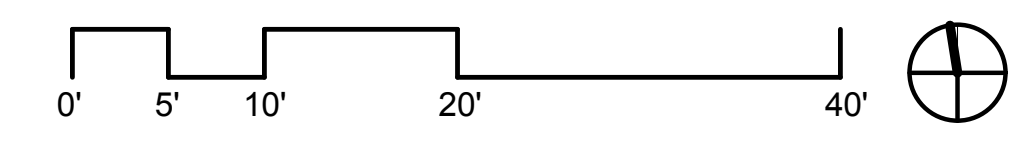
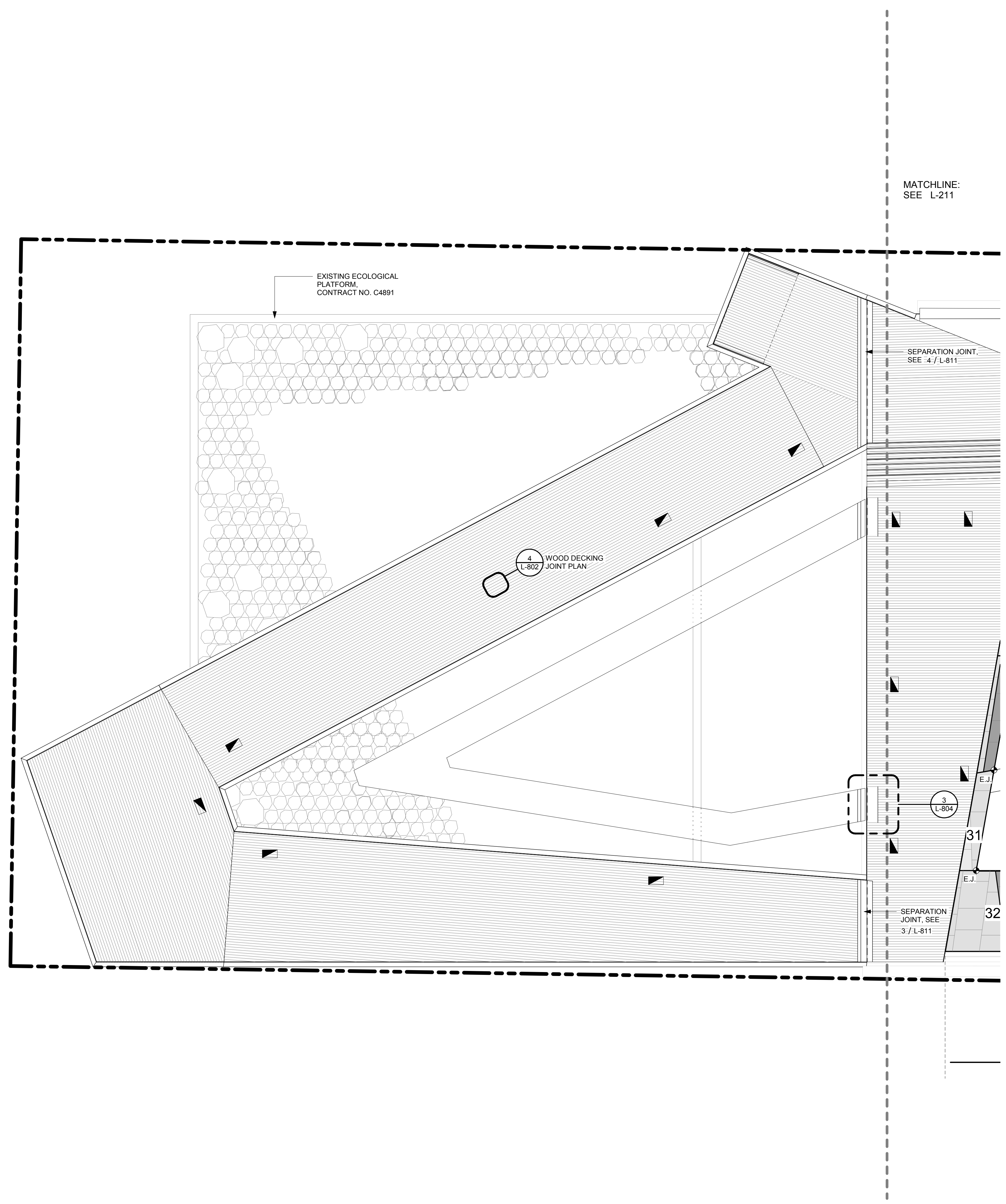
L-230.00

LEGEND

- LIMIT OF WORK
- STRUCTURE OVERHEAD
- EXPANSION JOINT, SEE 7 / L-800
- CONTROL JOINT, SEE 6 / L-800
- CONCRETE - SANDBLAST FINISH, SEE SPEC
- CONCRETE - BROOM FINISH, SEE SPEC
- CONCRETE - INLAID FINISH, SEE SPEC
- INLAY MATERIAL MIXES 1-5, SEE SPEC AND 6 / L-243
- WOOD DECKING BOARD ORIENTATION
- S.S. EMBED ANCHORS FOR FURNISHING, SEE 3 / L-850
- POINT OF BEGINNING (POB)
- PULLBOX UNDER DECKING, SEE 7 / L-803 AND ELECTRICAL DRAWINGS
- PULLBOX SET IN CONCRETE PAVING, SEE ELECTRICAL DRAWINGS, TO BE PLACED IN ALIGNMENT WITH PAVING PATTERN IN FIELD, BY ARCHITECT

NOTES

1. SEE L-800 FOR PAVING DETAILS
2. SEE L-240 SERIES FOR PAVING MODULE JOINTING



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HUDSON RIVER PARK

Segment 3

PIER 26 UPLAND PARK CONSTRUCTION

C4891 - A-E

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New York, NY 10005
212. 620. 7970

Marine Engineer:
MRCE
14 Penn Plaza
225 West 34th Street
New York, NY 10122
917. 339. 9300

Ecologist:
BIOHABITATS
529 5th Avenue, 14th Floor
New York, NY 10018
646. 876. 9350

Lighting Designer:
TILLET LIGHTING DESIGN, Inc.
15 Maiden Lane, Suite 508
New York, NY 10039
212. 766. 0144

MEP Engineer:
WESLER-COHEN
740 Broadway
Amityville, NY 11701
631. 789. 8811

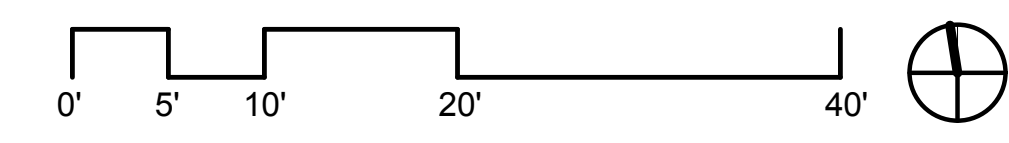
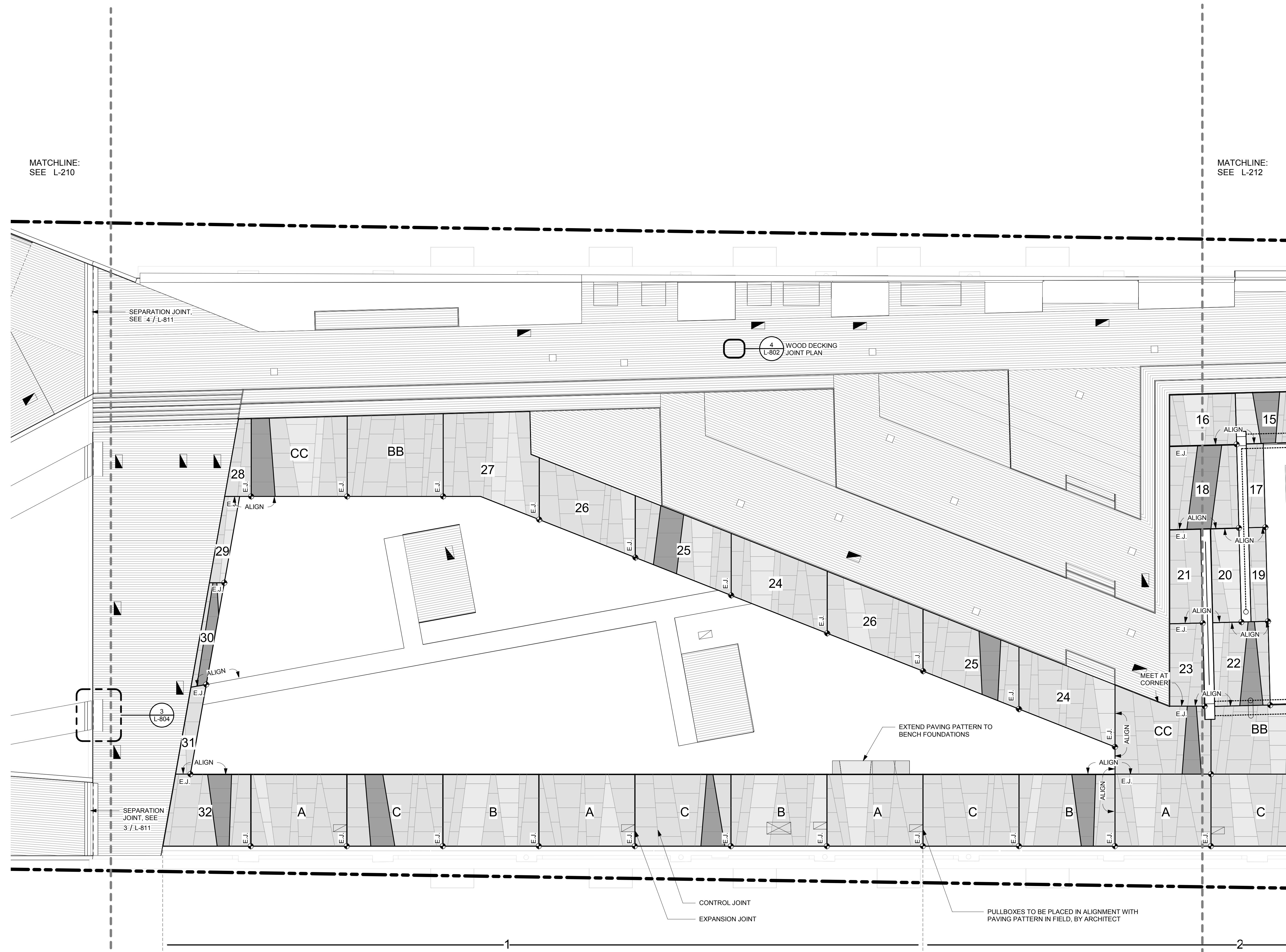
Irrigation:
NORTHERN DESIGNS, LLC
2089 Hartford Turnpike
North Haven, CT 06473
203. 239. 2710

LEGEND

- LIMIT OF WORK
- STRUCTURE OVERHEAD
- EXPANSION JOINT, SEE 7 / L-800
- CONTROL JOINT, SEE 6 / L-800
- CONCRETE - SANDBLAST FINISH, SEE SPEC
- CONCRETE - BROOM FINISH, SEE SPEC
- CONCRETE - INLAID FINISH, SEE SPEC
- INLAY MATERIAL MIXES 1-5, SEE SPEC AND 6 / L-243
- WOOD DECKING BOARD ORIENTATION
- S.S. EMBED ANCHORS FOR FURNISHING, SEE 3 / L-850
- POINT OF BEGINNING (POB)
- PULLBOX UNDER DECKING, SEE 7 / L-803 AND ELECTRICAL DRAWINGS
- PULLBOX SET IN CONCRETE PAVING, SEE ELECTRICAL DRAWINGS, TO BE PLACED IN ALIGNMENT WITH PAVING PATTERN IN FIELD, BY ARCHITECT

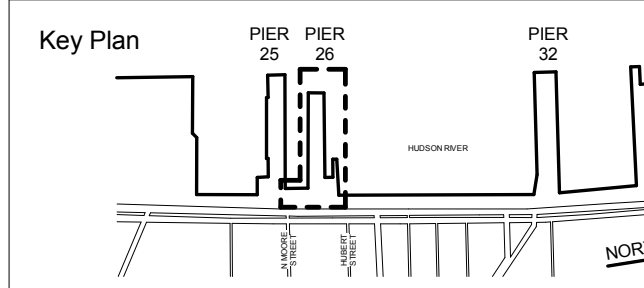
NOTES

1. SEE L-800 FOR PAVING DETAILS
2. SEE L-240 SERIES FOR PAVING MODULE JOINTING



Seal

No.	Date	Description
U2	11/30/2018	ADDENDUM 2



PAVING & DECKING PLAN - PIER B

Scale: 1" = 10'-0"
Date: 09/28/2018
Drawn: JK
Checked: DS
Project No.: 1527

The Honorable
ANDREW M. CUOMO
Governor, State of New York

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Mayor, City of New York

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President, Borough of Manhattan

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Chairman,
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BARL SEGGS
Commissioner,
New York State Department of
Environmental Conservation

HUDSON RIVER PARK

Segment 3

PIER 26 UPLAND PARK CONSTRUCTION

C4891 - A-E

OLIN
LANDSCAPE ARCHITECTURE / URBAN DESIGN / PLANNING
PUBLIC LEADER BUILDING, SUITE 1122
100 SOUTH HOOPER STREET, WEST
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OLIN PARTNERSHIP, LTD.

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212. 840. 6331

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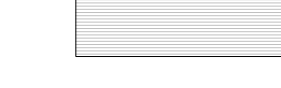


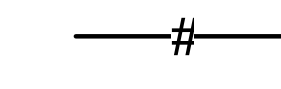
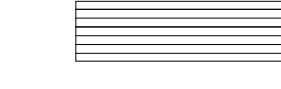



Ecologist:
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529 5th Avenue, 14th Floor
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646. 876. 9350

Lighting Designer:
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New York, NY 10038
212. 766. 0144

MEP Engineer:
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740 Broadway
Amityville, NY 11701
631. 789. 8811

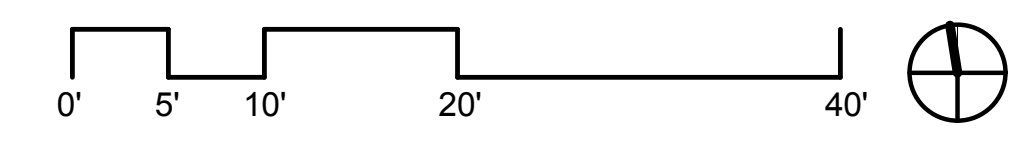
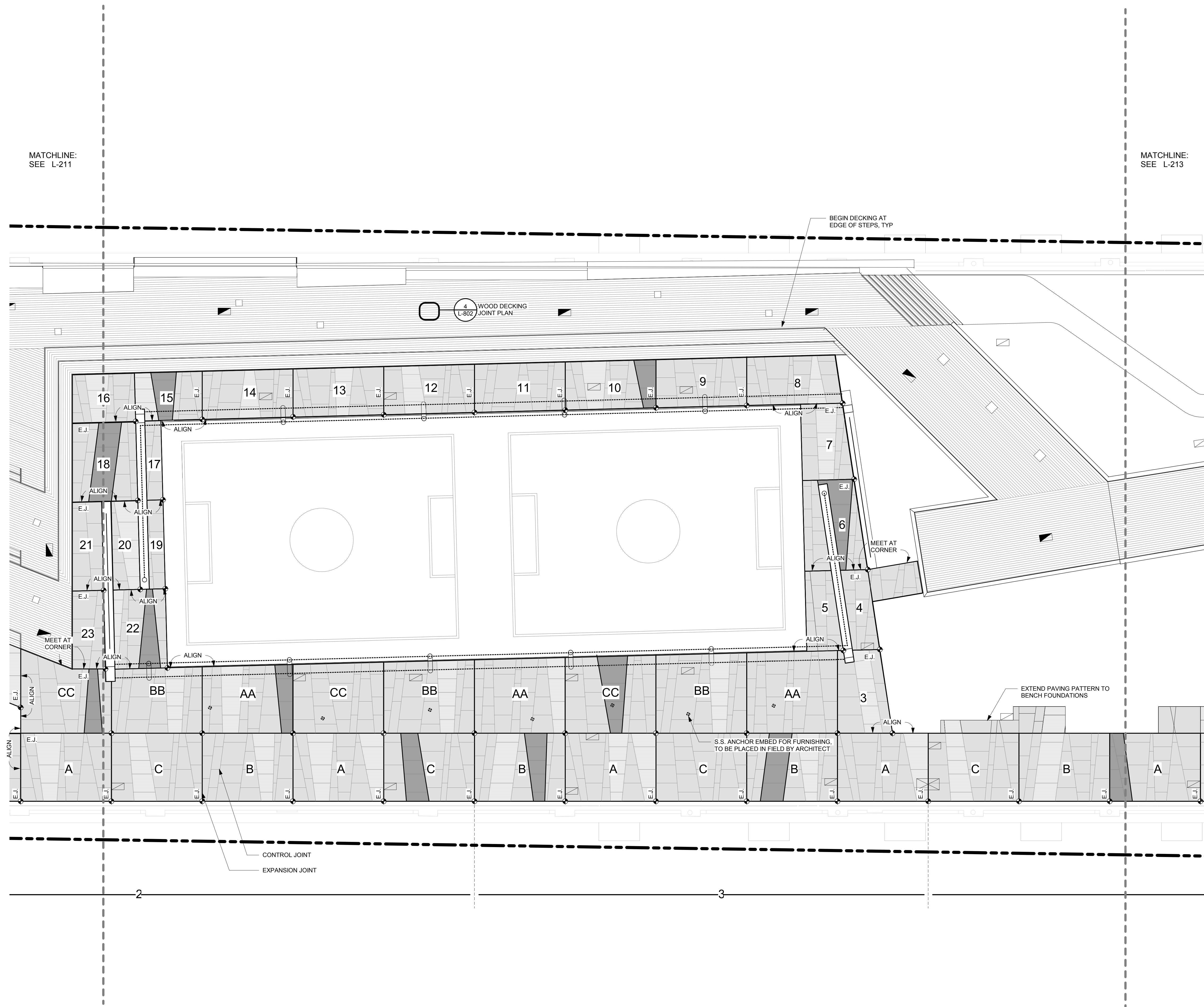
Irrigation:
NORTHERN DESIGNS, LLC
2089 Hartford Turnpike
North Haven, CT 06473
203. 239. 2710

LEGEND

-  LIMIT OF WORK
-  STRUCTURE OVERHEAD
-  EXPANSION JOINT, SEE 7 / L-800
-  CONTROL JOINT, SEE 6 / L-800
-  CONCRETE - SANDBLAST FINISH, SEE SPEC
-  CONCRETE - BROOM FINISH, SEE SPEC
-  CONCRETE - INLAID FINISH, SEE SPEC
-  INLAY MATERIAL MIXES 1-5, SEE SPEC AND 6 / L-243
-  WOOD DECKING BOARD ORIENTATION
-  S.S. EMBED ANCHORS FOR FURNISHING, SEE 3 / L-850
-  POINT OF BEGINNING (POB)
-  PULLBOX UNDER DECKING, SEE 7 / L-803 AND ELECTRICAL DRAWINGS
-  PULLBOX SET IN CONCRETE PAVING, SEE ELECTRICAL DRAWINGS, TO BE PLACED IN ALIGNMENT WITH PAVING PATTERN IN FIELD, BY ARCHITECT

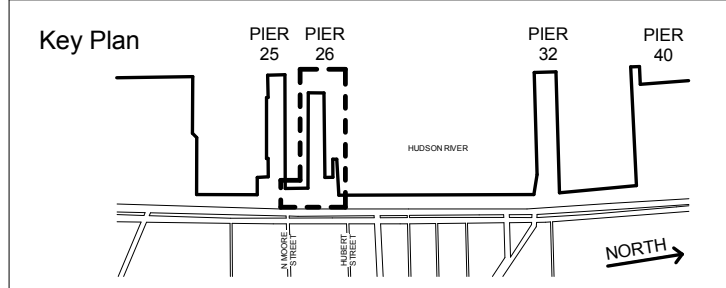
NOTES

1. SEE L-800 FOR PAVING DETAILS
2. SEE L-240 SERIES FOR PAVING MODULE JOINTING



Seal

No.	Date	Description
09/28/2018		ISSUED FOR BID
U2	11/30/2018	ADDENDUM 2



PAVING & DECKING PLAN - PIER C

Scale: 1" = 10'-0"
Date: 09/28/2018
Drawn: JK
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Project No.: 1527

L-232.00



Hudson River Park Trust

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Parks and Recreation

BARIL SEGOS
Commissioner,
New York State Department of
Environmental Conservation

HUDSON RIVER PARK

Segment 3

PIER 26 UPLAND PARK CONSTRUCTION

C4891 - A-E

OLIN
LANDSCAPE ARCHITECTURE / URBAN DESIGN / PLANNING
PUBLIC LEADER BUILDING, SUITE 1122
150 SOUTH INDEPENDENCE SQUARE WEST
PHILADELPHIA, PA 19102
TEL: 215.440.0030 / FAX: 215.440.0041
WWW.THEOLINSTUDIO.COM
OLIN PARTNERSHIP, LTD.

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379 West Broadway, 2nd Floor
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Structural Engineer:
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Ecologist:
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New York, NY 10018
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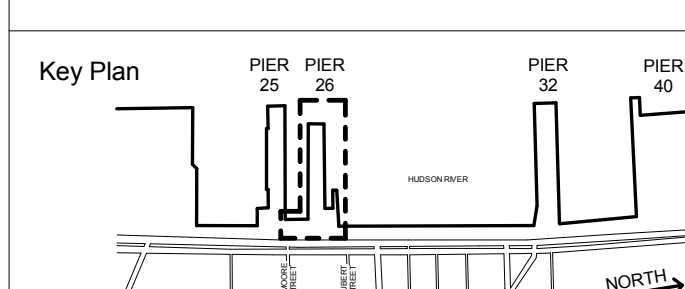
Lighting Designer:
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631. 789. 8811

Irrigation:
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2089 Hartford Turnpike
North Haven, CT 06473
203. 239. 2710

Seal

No.	Date	Description
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PAVING & DECKING PLAN - PIER D

Scale: 1" = 10'-0"
Date: 09/28/2018
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Project No.: 1527

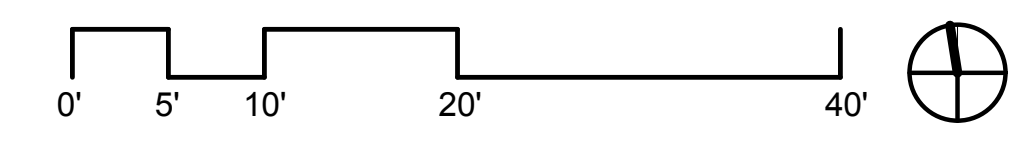
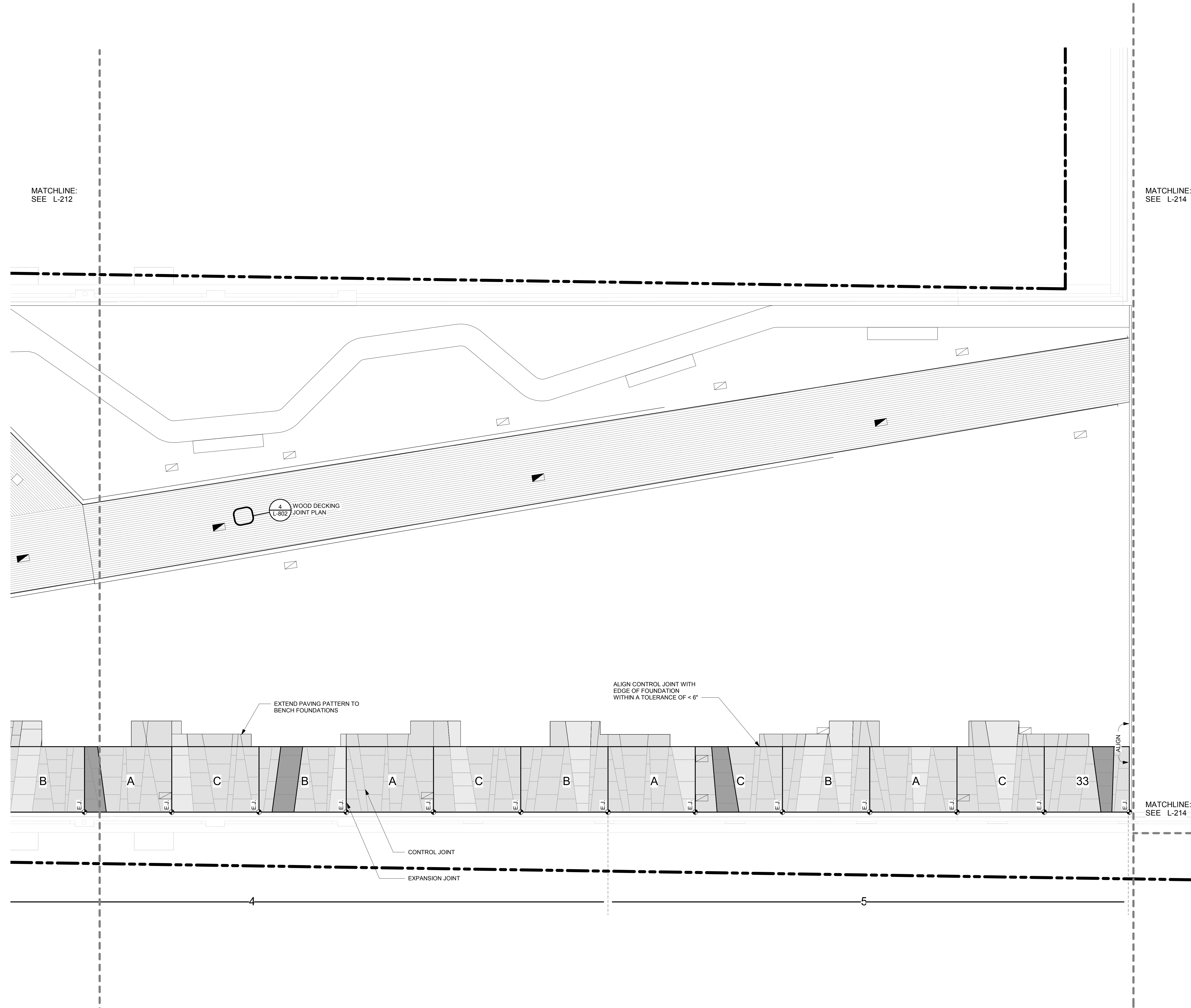
L-233.00

LEGEND

- LIMIT OF WORK
- STRUCTURE OVERHEAD
- EXPANSION JOINT, SEE 7 / L-800
- CONTROL JOINT, SEE 6 / L-800
- CONCRETE - SANDBLAST FINISH, SEE SPEC
- CONCRETE - BROOM FINISH, SEE SPEC
- CONCRETE - INLAID FINISH, SEE SPEC
- INLAY MATERIAL MIXES 1-5, SEE SPEC AND 6 / L-243
- WOOD DECKING BOARD ORIENTATION
- S.S. EMBED ANCHORS FOR FURNISHING, SEE 3 / L-850
- POINT OF BEGINNING (POB)
- PULLBOX UNDER DECKING, SEE 7 / L-803 AND ELECTRICAL DRAWINGS
- PULLBOX SET IN CONCRETE PAVING, SEE ELECTRICAL DRAWINGS, TO BE PLACED IN ALIGNMENT WITH PAVING PATTERN IN FIELD, BY ARCHITECT

NOTES

1. SEE L-800 FOR PAVING DETAILS
2. SEE L-240 SERIES FOR PAVING MODULE JOINTING





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New York State Department of
Environmental Conservation



HUDSON RIVER PARK

Segment 3

PIER 26 UPLAND PARK CONSTRUCTION

C4891 - A-E

OLIN

LANDSCAPE ARCHITECTURE / URBAN DESIGN / PLANNING
PUBLIC LEADER BUILDING, SUITE 1122
100 SOUTH WOODFORD SQUARE, WEST
PHILADELPHIA, PA 19107
TEL: 215.440.0030 / FAX: 215.440.0041
WWW.THEOLINSTUDIO.COM
OLIN PARTNERSHIP, LTD.

Surveyor:
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379 West Broadway, 2nd Floor
New York, NY 10012
212. 840. 6331

Structural Engineer:
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32 Old Slip, 10th Floor
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Ecologist:
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New York, NY 10018
646. 876. 9350

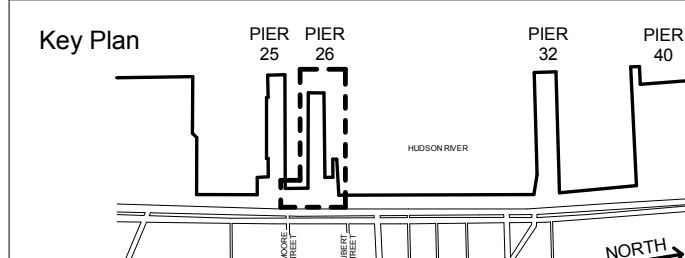
Lighting Designer:
TILLET LIGHTING DESIGN, Inc.
15 Maiden Lane, Suite 508
New York, NY 10038
212. 766. 0144

MEP Engineer:
WESLER-COHEN
740 Broadway
Armsville, NY 11701
631. 789. 8811

Irrigation:
NORTHERN DESIGNS, LLC
2089 Hartford Turnpike
North Haven, CT 06473
203. 239. 2710

Seal

No.	Date	Description
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U2	11/30/2018	ADDENDUM 2



PAVING & DECKING PLAN - NORTH UPLAND

Scale: 1" = 10'-0"
Date: 09/28/2018
Drawn: JK
Checked: DS
Project No.: 1527

L-234.00

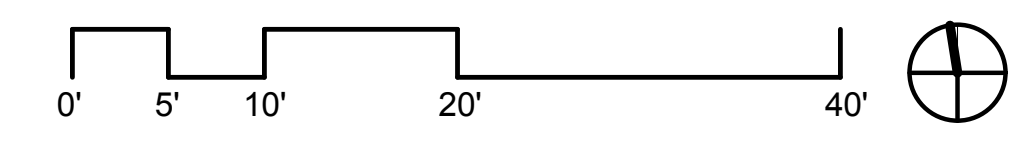
LEGEND

- LIMIT OF WORK
- STRUCTURE OVERHEAD
- EXPANSION JOINT, SEE 7 / L-800
- CONTROL JOINT, SEE 6 / L-800
- CONCRETE - SANDBLAST FINISH, SEE SPEC
- CONCRETE - BROOM FINISH, SEE SPEC
- CONCRETE - INLAID FINISH, SEE SPEC
- INLAY MATERIAL MIXES 1-5, SEE SPEC AND 6 / L-243
- WOOD DECKING BOARD ORIENTATION
- S.S. EMBED ANCHORS FOR FURNISHING, SEE 3 / L-850
- POINT OF BEGINNING (POB)
- PULLBOX UNDER DECKING, SEE 7 / L-803 AND ELECTRICAL DRAWINGS
- PULLBOX SET IN CONCRETE PAVING, SEE ELECTRICAL DRAWINGS, TO BE PLACED IN ALIGNMENT WITH PAVING PATTERN IN FIELD, BY ARCHITECT

NOTES

1. SEE L-800 FOR PAVING DETAILS
2. SEE L-240 SERIES FOR PAVING MODULE JOINTING

MATCHLINE:
SEE L-213





Hudson River Park Trust

The Honorable
ANDREW M. CUOMO
Governor, State of New York

The Honorable
BILL de BLASIO
Mayor, City of New York

The Honorable
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President, Borough of Manhattan

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New York State Office of Parks,
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MITCHELL J. SILVER
Commissioner,
City of New York
Parks and Recreation

BARIL SEGROS
Commissioner,
New York State Department of
Environmental Conservation



HUDSON RIVER PARK

Segment 3

PIER 26 UPLAND PARK CONSTRUCTION

C4891 - A-E

OLIN

LANDSCAPE ARCHITECTURE / URBAN DESIGN / PLANNING
PUBLIC LEADER BUILDING SUITE 1122
150 SOUTH WASHINGTON STREET, PHILADELPHIA, PA 19102
TEL: 215.440.0030 / FAX: 215.440.0041
WWW.THEOLINSTUDIO.COM
OLIN PARTNERSHIP, LTD.

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379 West Broadway, 2nd Floor
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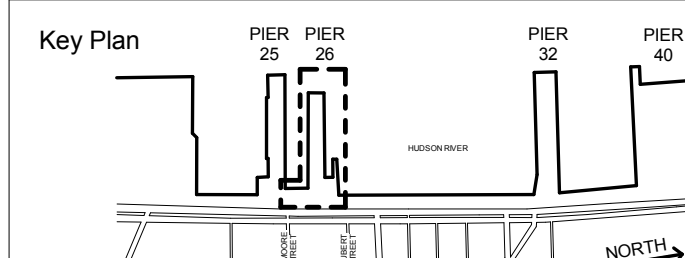
Lighting Designer:
TILLET LIGHTING DESIGN, Inc.
15 Maiden Lane, Suite 508
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Irrigation:
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2089 Hartford Turnpike
North Haven, CT 06473
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Seal

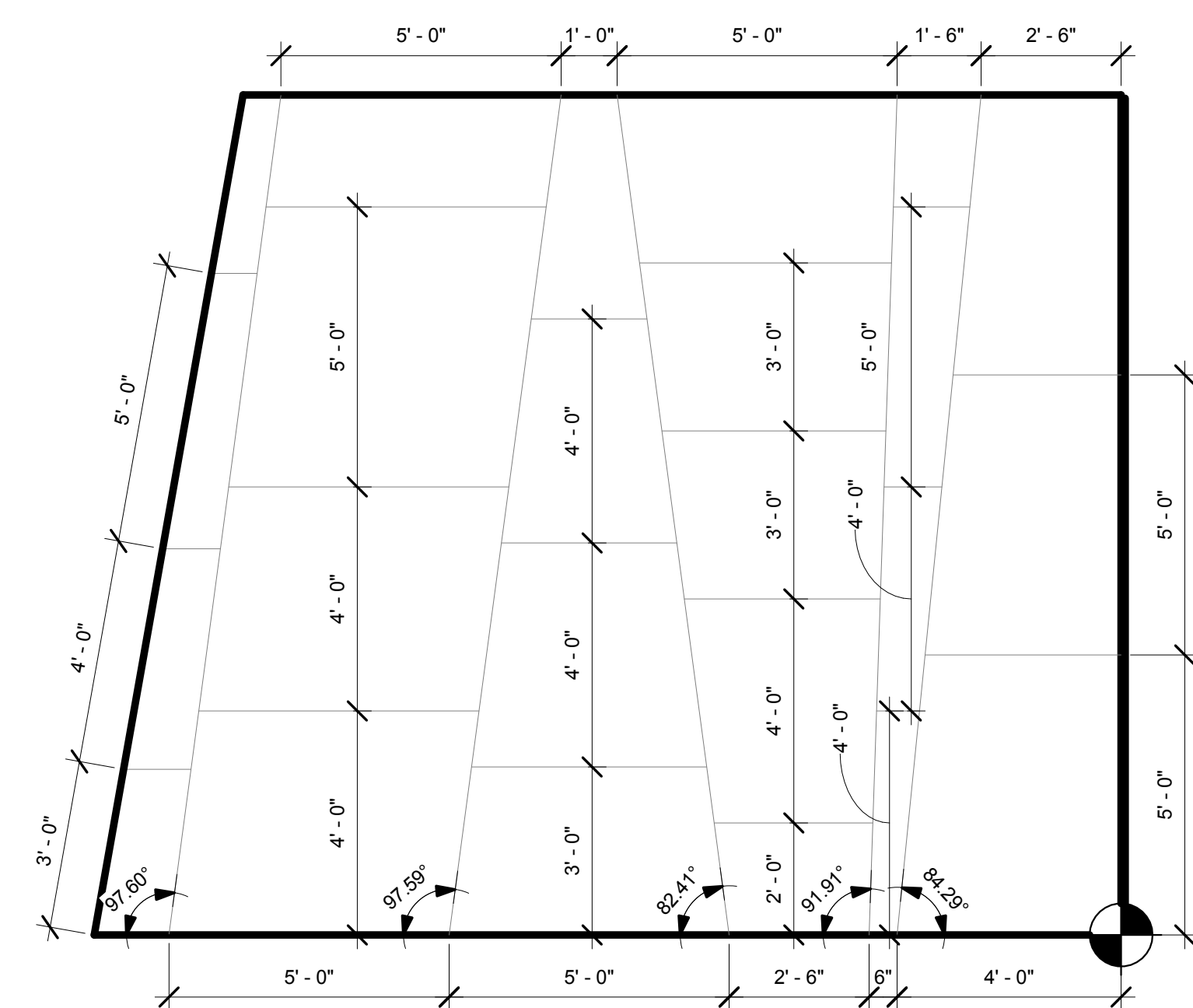
No.	Date	Description
09/28/2018	ISSUED FOR BID	
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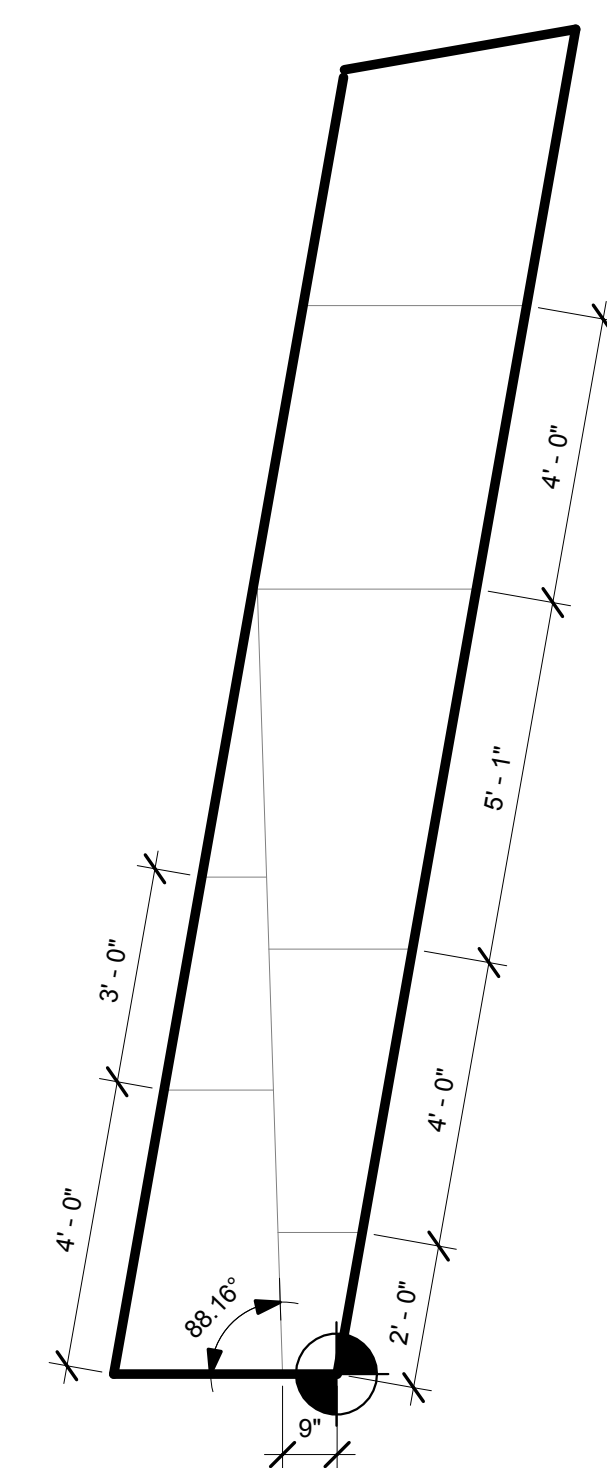
PAVING MODULES

Scale: As indicated
Date: 09/28/2018
Drawn: JK
Checked: DS
Project No.: 1527

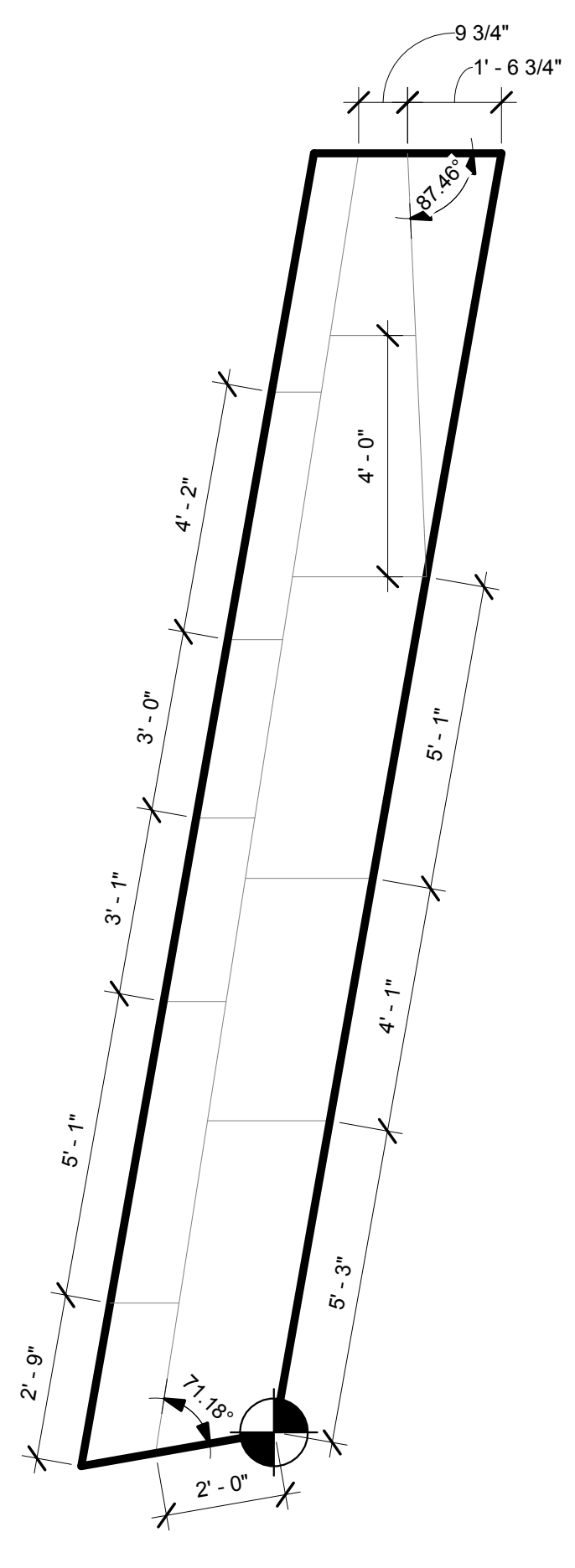
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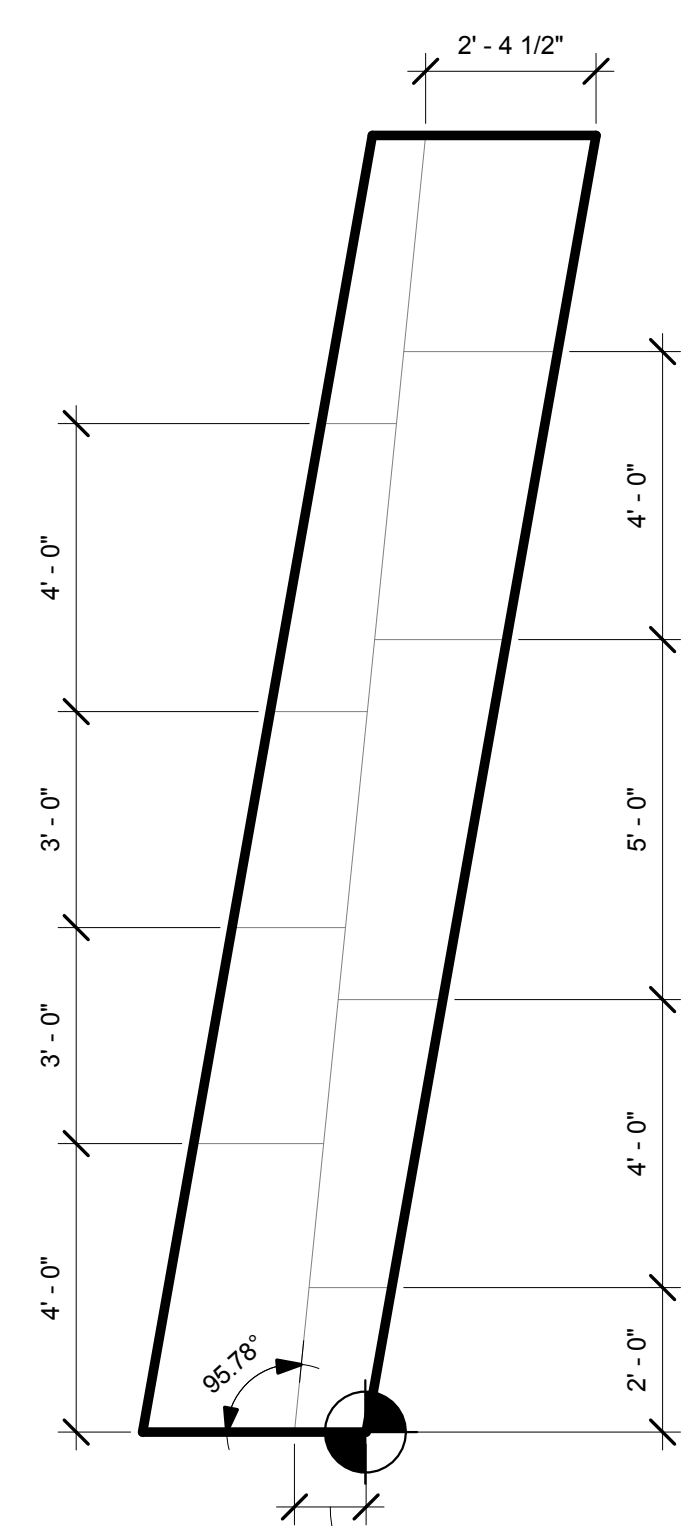
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3/8" = 1'-0"



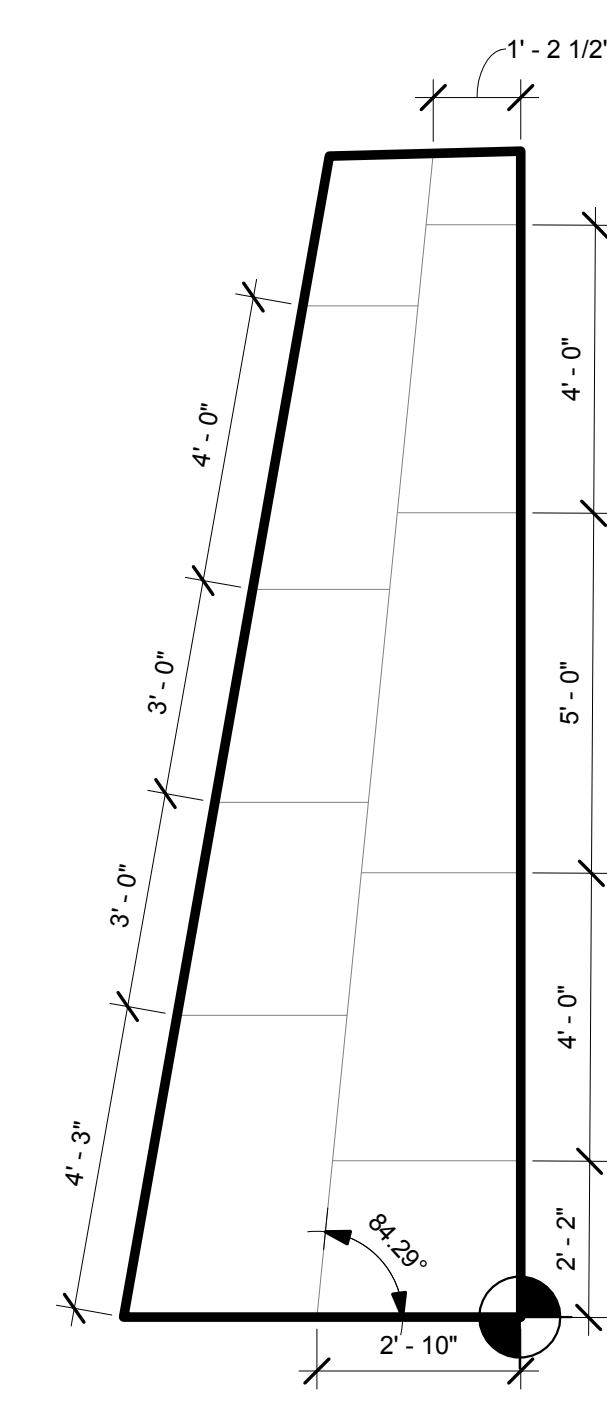
④ Paving Module 31
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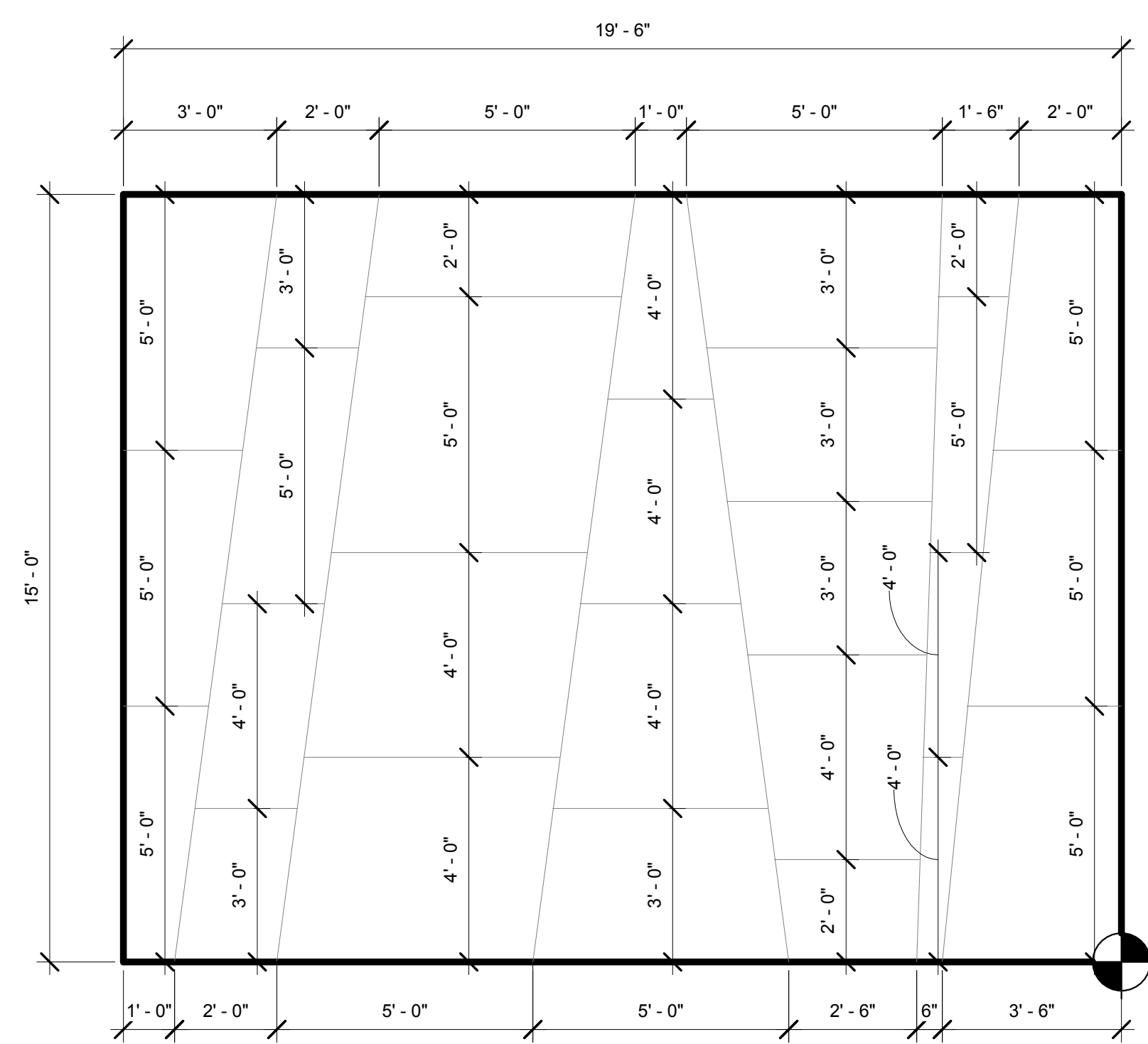
③ Paving Module 30
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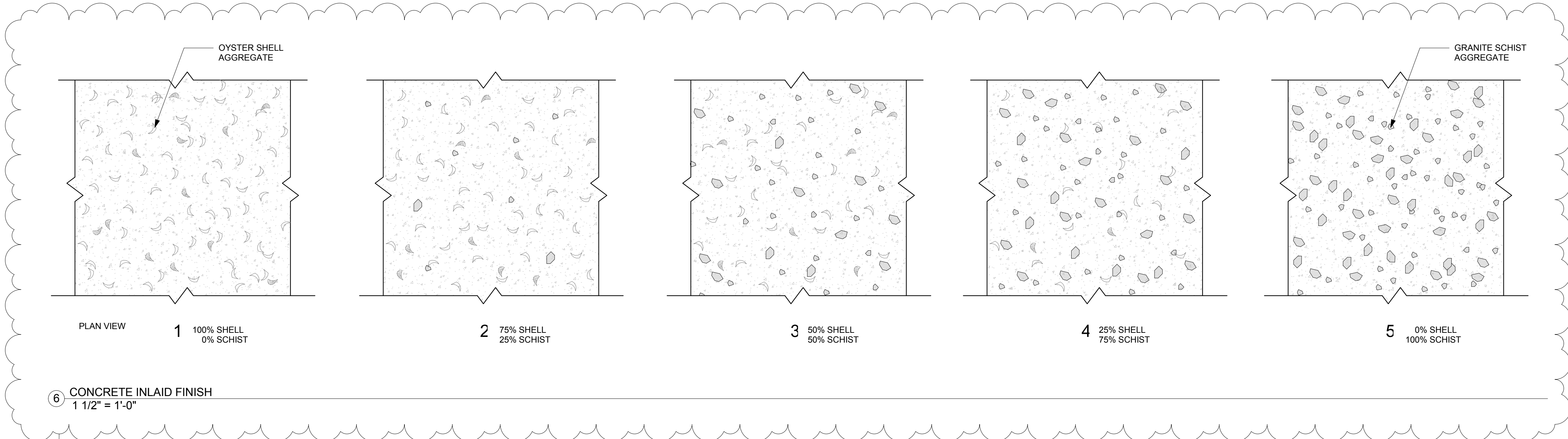
② Paving Module 29
3/8" = 1'-0"



① Paving Module 28
3/8" = 1'-0"



⑦ Paving Module 33
3/8" = 1'-0"



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HUDSON RIVER PARK

Segment 3

PIER 26 UPLAND PARK CONSTRUCTION

C4891 - A-E

OLIN
LANDSCAPE ARCHITECTURE / URBAN DESIGN / PLANNING
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195 SOUTH WASHINGTON STREET
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WWW.THEOLININSTITUTE.COM
OLIN.PARTNERSHIP@OLIN.COM

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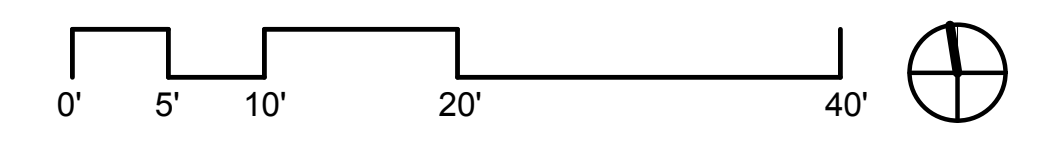
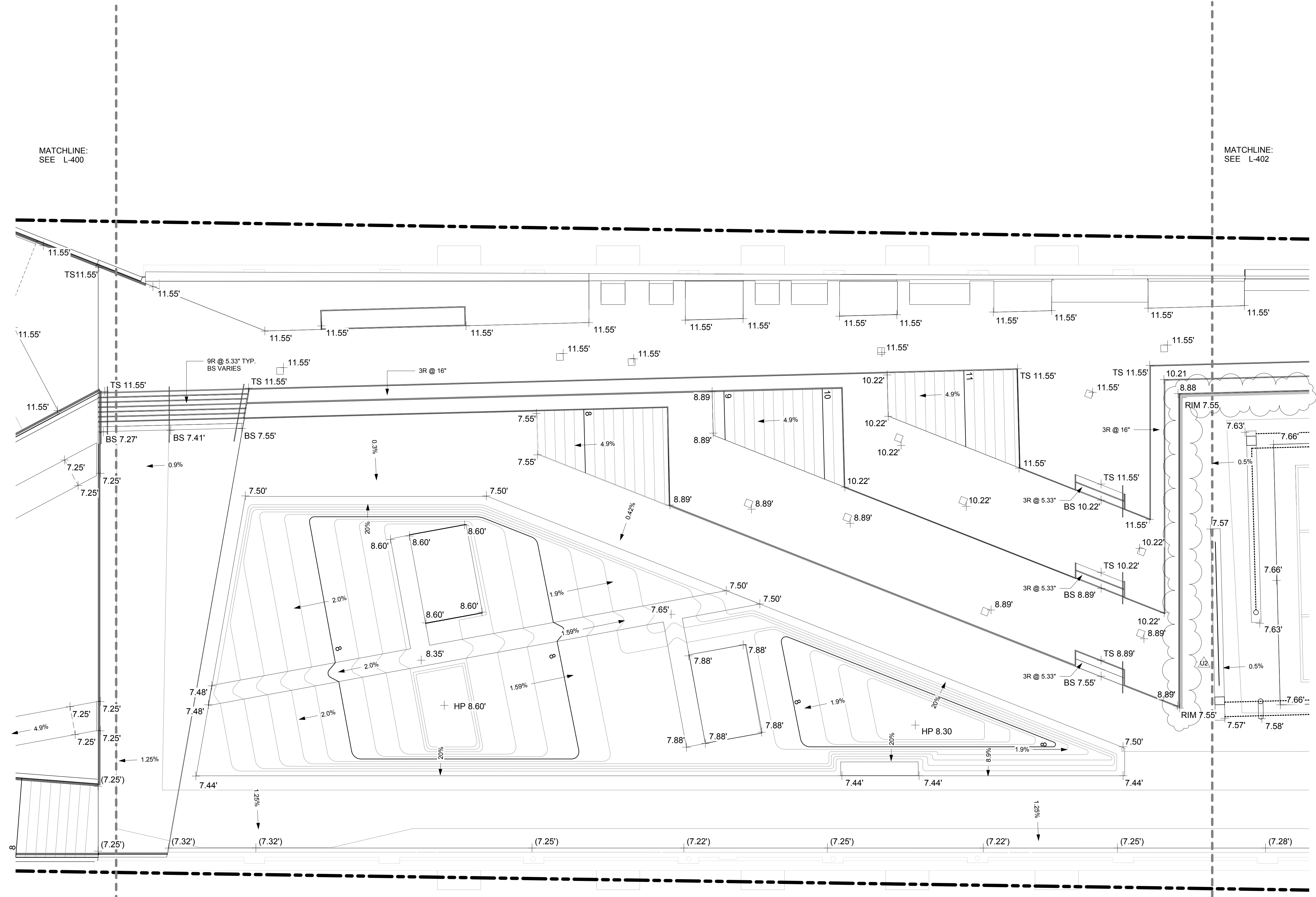
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LEGEND

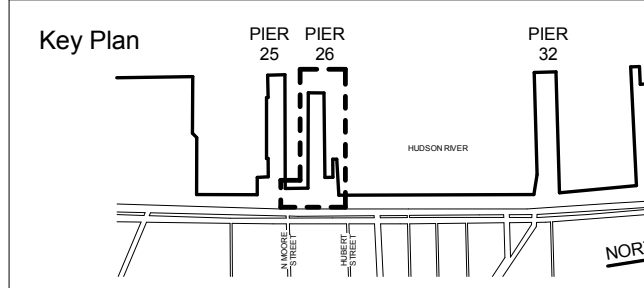
	LIMIT OF WORK
	STRUCTURE OVERHEAD
	MINOR CONTOUR
	MAJOR CONTOUR
	TRENCH DRAIN, SEE 1 / L-511
	SLOT DRAIN, SEE 2 / L-511
	PROPOSED SPOT ELEVATION
	EXISTING SPOT ELEVATION
	SLOPE
	TOP OF WALL
	BOTTOM OF WALL
	TOP OF CURB
	BOTTOM OF CURB

- NOTES**
- CONTRACTOR SHALL VERIFY ALL EXISTING GRADES IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE LANDSCAPE ARCHITECT. CONTRACTOR SHALL STAKE ALL ELEVATIONS TO BE APPROVED BY THE LANDSCAPE ARCHITECT BEFORE CONSTRUCTION.
 - ALL LINES AND GRADE WORK NOT PRESENTLY ESTABLISHED AT THE SITE SHALL BE LAID OUT BY A REGISTERED LAND SURVEYOR OR PROFESSIONAL CIVIL ENGINEER EMPLOYED BY THE CONTRACTOR IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. CONTRACTOR SHALL ESTABLISH PERMANENT BENCHMARKS AND BOUNDS AND REPLACE ANY WHICH ARE DESTROYED OR DISTURBED.
 - THE WORDS "FINISHED GRADE" (F.G.) SHALL MEAN THE REQUIRED FINAL GRADE ELEVATIONS INDICATED ON THE DRAWINGS.
 - SPOT ELEVATIONS SHALL GOVERN OVER PROPOSED CONTOURS.
 - CONTRACTOR SHALL ENSURE CONSISTENT SLOPE BETWEEN SPOT ELEVATIONS.
 - AT RIDGE LINES, HIGH POINTS AND LOW POINTS, CONTRACTOR SHALL TRANSITION GRADE TO AVOID A POINT OR SHARP EDGE.
 - ALL WORK PERFORMED IN A PUBLIC RIGHT-OF-WAY SHALL MEET THE REQUIREMENTS OF THE LOCAL MUNICIPALITY.
 - CONTRACTOR SHALL NOT PERFORM WORK OUTSIDE THE DESIGNATED SITE BOUNDARY. IF FIELD CONDITIONS WARRANT OFF-SITE GRADING, PERMISSION SHALL BE OBTAINED BY CONTRACTOR FROM THE AFFECTED PROPERTY OWNERS.
 - ALL SIDEWALKS, STOOPS, TERRACES AND OTHER PAVED AREAS SHALL SLOPE AWAY FROM BUILDING(S) AT 2.0% MAXIMUM.



Seal

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09/28/2018		ISSUED FOR BID
U2	11/30/2018	ADDENDUM 2



GRADING PLAN - PIER B

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Chairman,
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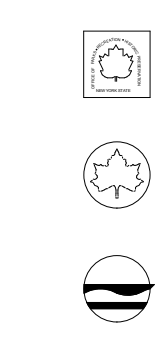
ALICIA GLEN
Vice Chairman,
Hudson River Park Trust

MADELYN WILS
President,
Hudson River Park Trust

ROSE HARVEY
Commissioner,
New York State Office of Parks,
Recreation and Historic Preservation

MITCHELL J. SILVER
Commissioner,
City of New York
Parks and Recreation

BARIL SEGOND
Commissioner,
New York State Department of
Environmental Conservation



HUDSON RIVER PARK

Segment 3

PIER 26 UPLAND PARK CONSTRUCTION

C4891 - A-E

OLIN

LANDSCAPE ARCHITECTURE / URBAN DESIGN / PLANNING
PUBLIC LEDGER BUILDING, SUITE 1120
150 SOUTH BROADWAY, PHILADELPHIA, PA 19102
TEL: 215.440.0000 / FAX: 215.440.0041
WWW.THEOLINSTUDIO.COM
OLIN PARTNERSHIP, LTD.

Surveyor:
GSESP, Inc.
379 West Broadway, 2nd Floor
New York, NY 10012
212. 840. 6331

Structural Engineer:
SILMAN
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212. 620. 7970

Marine Engineer:
MRCE
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New York, NY 10122
917. 339. 9300

Ecologist:
BIOHABITATS
529 5th Avenue, 14th Floor
New York, NY 10018
646. 876. 9350

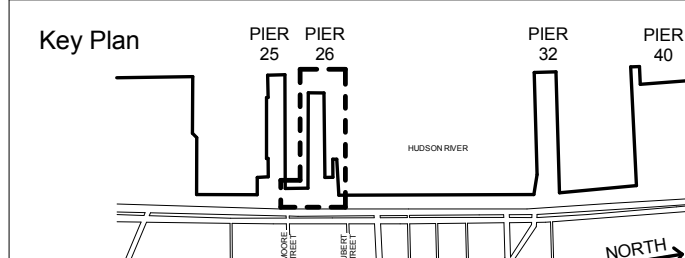
Lighting Designer:
TILLET LIGHTING DESIGN, Inc.
15 Maiden Lane, Suite 508
New York, NY 10009
212. 766. 0144

MEP Engineer:
WESLER-COHEN
740 Broadway
Amityville, NY 11701
631. 789. 8811

Irrigation:
NORTHERN DESIGNS, LLC
2089 Hartford Turnpike
North Haven, CT 06473
203. 239. 2710

Seal

No.	Date	Description
09/28/2018		ISSUED FOR BID
U2	11/30/2018	ADDENDUM 2



GRADING PLAN - PIER C

Scale: 1" = 10'-0"
Date: 09/28/2018
Drawn: JK
Checked: DS
Project No.: 1527

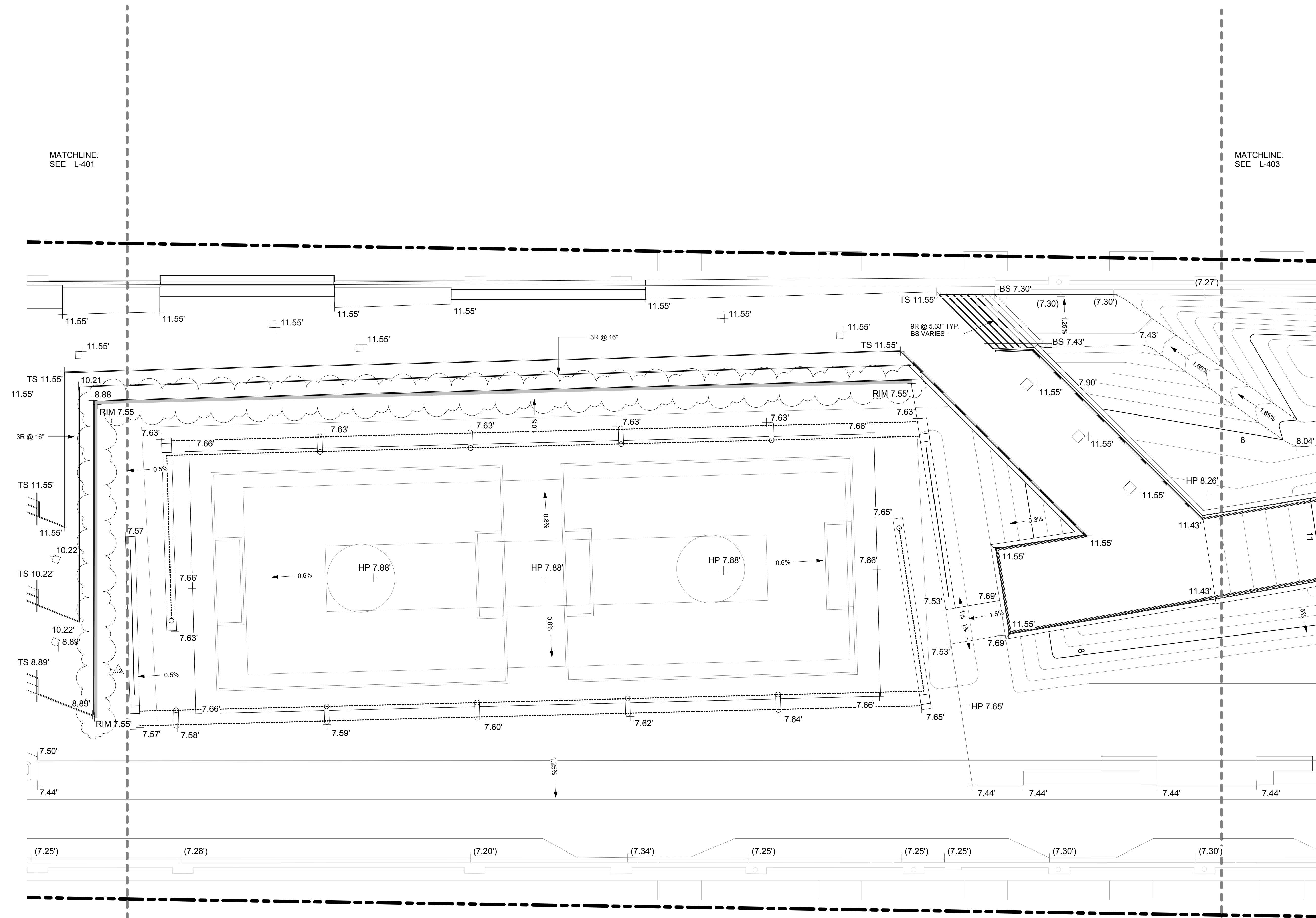
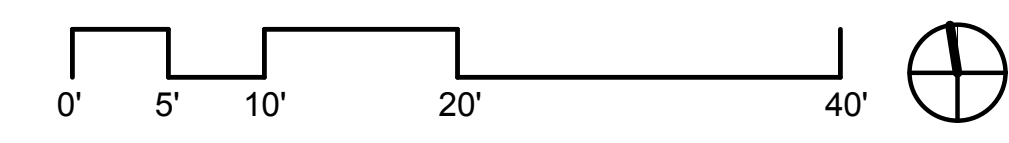
L-402.00

LEGEND

- LIMIT OF WORK
- STRUCTURE OVERHEAD
- MINOR CONTOUR
- MAJOR CONTOUR
- TRENCH DRAIN, SEE 1 / L-511
- SLOT DRAIN, SEE 2 / L-511
- PROPOSED SPOT ELEVATION
- EXISTING SPOT ELEVATION
- SLOPE
- TOP OF WALL
- BOTTOM OF WALL
- TOP OF CURB
- BOTTOM OF CURB

NOTES

1. CONTRACTOR SHALL VERIFY ALL EXISTING GRADES IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE LANDSCAPE ARCHITECT. CONTRACTOR SHALL STAKE ALL ELEVATIONS TO BE APPROVED BY THE LANDSCAPE ARCHITECT BEFORE CONSTRUCTION.
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3. CONTRACTOR SHALL ENSURE CONSISTENT SLOPE BETWEEN SPOT ELEVATIONS.
4. AT RIDGE LINES, HIGH POINTS AND LOW POINTS, CONTRACTOR SHALL TRANSITION GRADE TO AVOID A POINT OR SHARP EDGE.
5. ALL WORK PERFORMED IN A PUBLIC RIGHT-OF-WAY SHALL MEET THE REQUIREMENTS OF THE LOCAL MUNICIPALITY.
6. CONTRACTOR SHALL NOT PERFORM WORK OUTSIDE THE DESIGNATED SITE BOUNDARY. IF FIELD CONDITIONS WARRANT OFF-SITE GRADING, PERMISSION SHALL BE OBTAINED BY CONTRACTOR FROM THE AFFECTED PROPERTY OWNERS.
7. ALL SIDEWALKS, STOOPS, TERRACES AND OTHER PAVED AREAS SHALL SLOPE AWAY FROM BUILDING(S) AT 2.0% MAXIMUM.



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HUDSON RIVER PARK

Segment 3

PIER 26 UPLAND PARK
CONSTRUCTION

C4891 - A-E

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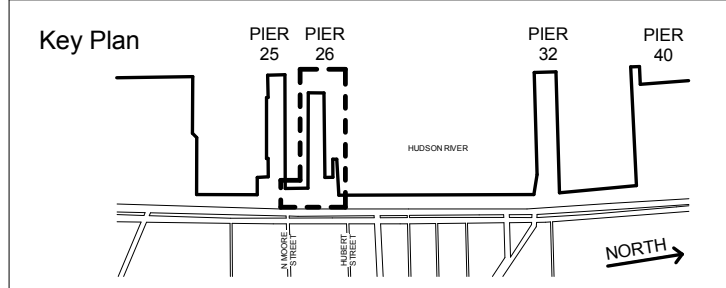
Lighting Designer:
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212.766.0144

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Irrigation:
NORTHERN DESIGNS, LLC
2089 Hartford Turnpike
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203.239.2710

Seal

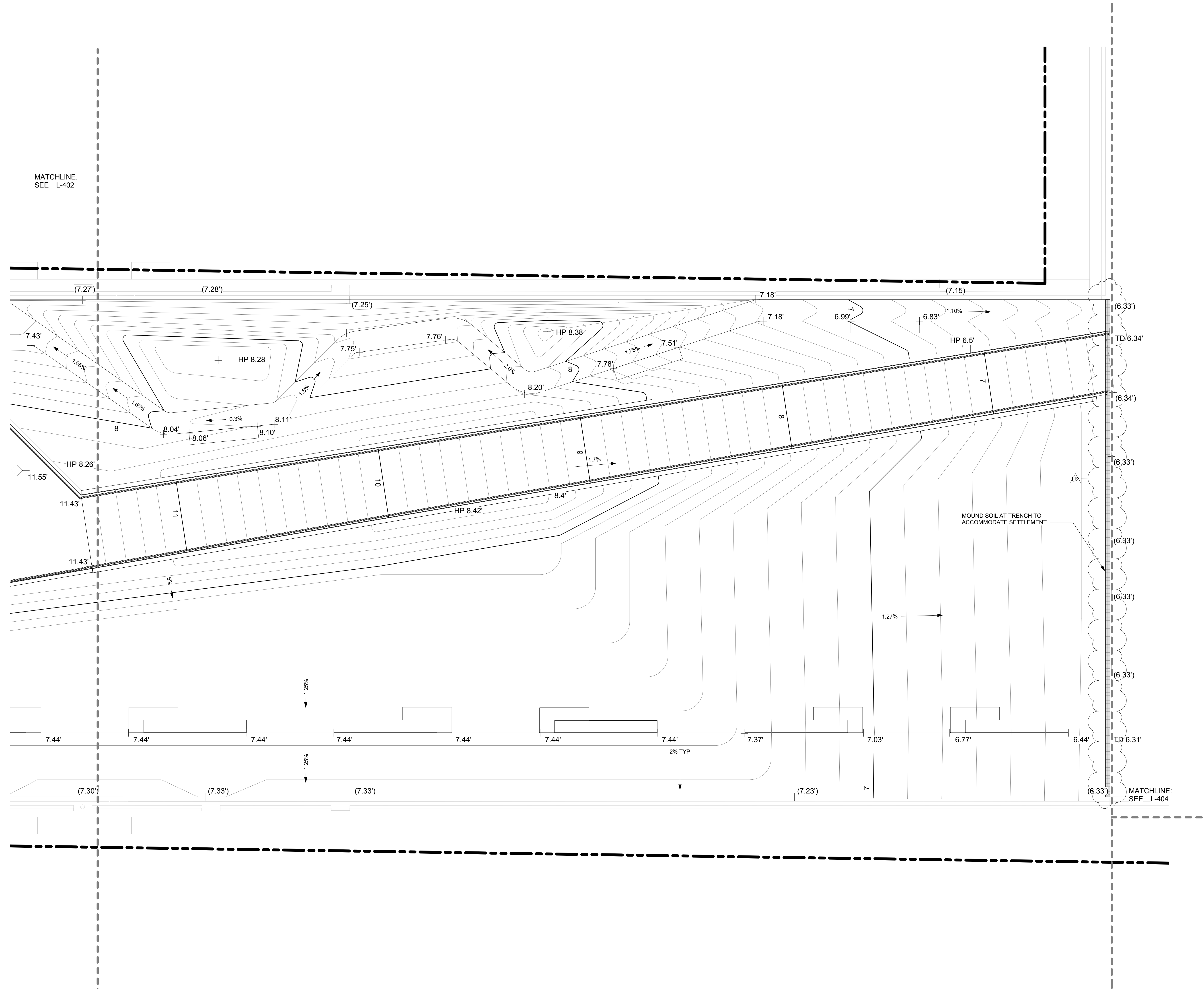
No.	Date	Description
09/28/2018		ISSUED FOR BID
U2	11/30/2018	ADDENDUM 2




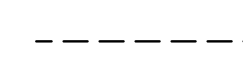

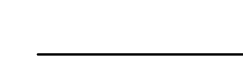
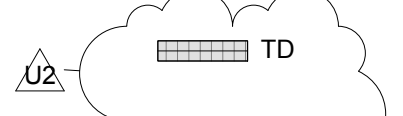
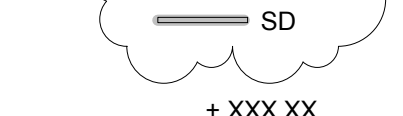
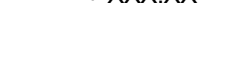
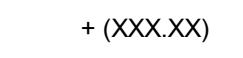
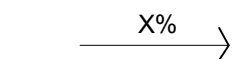




GRADING PLAN - PIER D

Scale: 1" = 10'-0"
Date: 09/28/2018
Drawn: JK
Checked: DS
Project No.: 1527

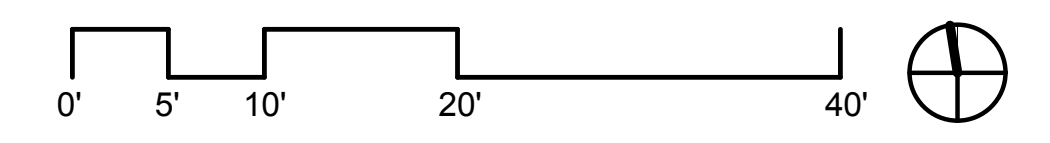
L-403.00



LEGEND

-  LIMIT OF WORK
-  STRUCTURE OVERHEAD
-  MINOR CONTOUR
-  MAJOR CONTOUR
-  TRENCH DRAIN, SEE 1 / L-511
-  SLOT DRAIN, SEE 2 / L-511
-  PROPOSED SPOT ELEVATION
-  EXISTING SPOT ELEVATION
-  SLOPE
-  TOP OF WALL
-  BOTTOM OF WALL
-  TOP OF CURB
-  BOTTOM OF CURB

- ### NOTES
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DAVE SEGROS
Commissioner,
New York State Department of
Environmental Conservation



HUDSON RIVER PARK

Segment 3

PIER 26 UPLAND PARK
CONSTRUCTION

C4891 - A-E

OLIN

LANDSCAPE ARCHITECTURE / URBAN DESIGN / PLANNING
PUBLIC LEADER BUILDING, SUITE 1125
150 SOUTH HOOPER STREET, 3RD FLOOR
PHILADELPHIA, PA 19106
TEL: 215.440.0030 / FAX: 215.440.0041
WWW.THEOLININSTITUTE.COM
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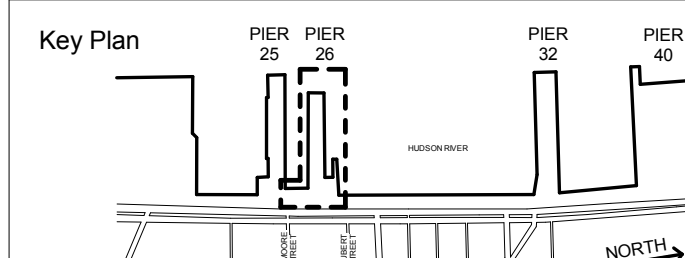
Lighting Designer:
TILLET LIGHTING DESIGN, Inc.
15 Maiden Lane, Suite 508
New York, NY 10039
212. 766. 0144

MEP Engineer:
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631. 789. 8811

Irrigation:
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2089 Hartford Turnpike
North Haven, CT 06473
203. 239. 2710

Seal

No.	Date	Description
09/28/2018		ISSUED FOR BID
U2	11/30/2018	ADDENDUM 2



GRADING PLAN - NORTH UPLAND

Scale: 1" = 10'-0"
Date: 09/28/2018
Drawn: JK
Checked: DS
Project No.: 1527

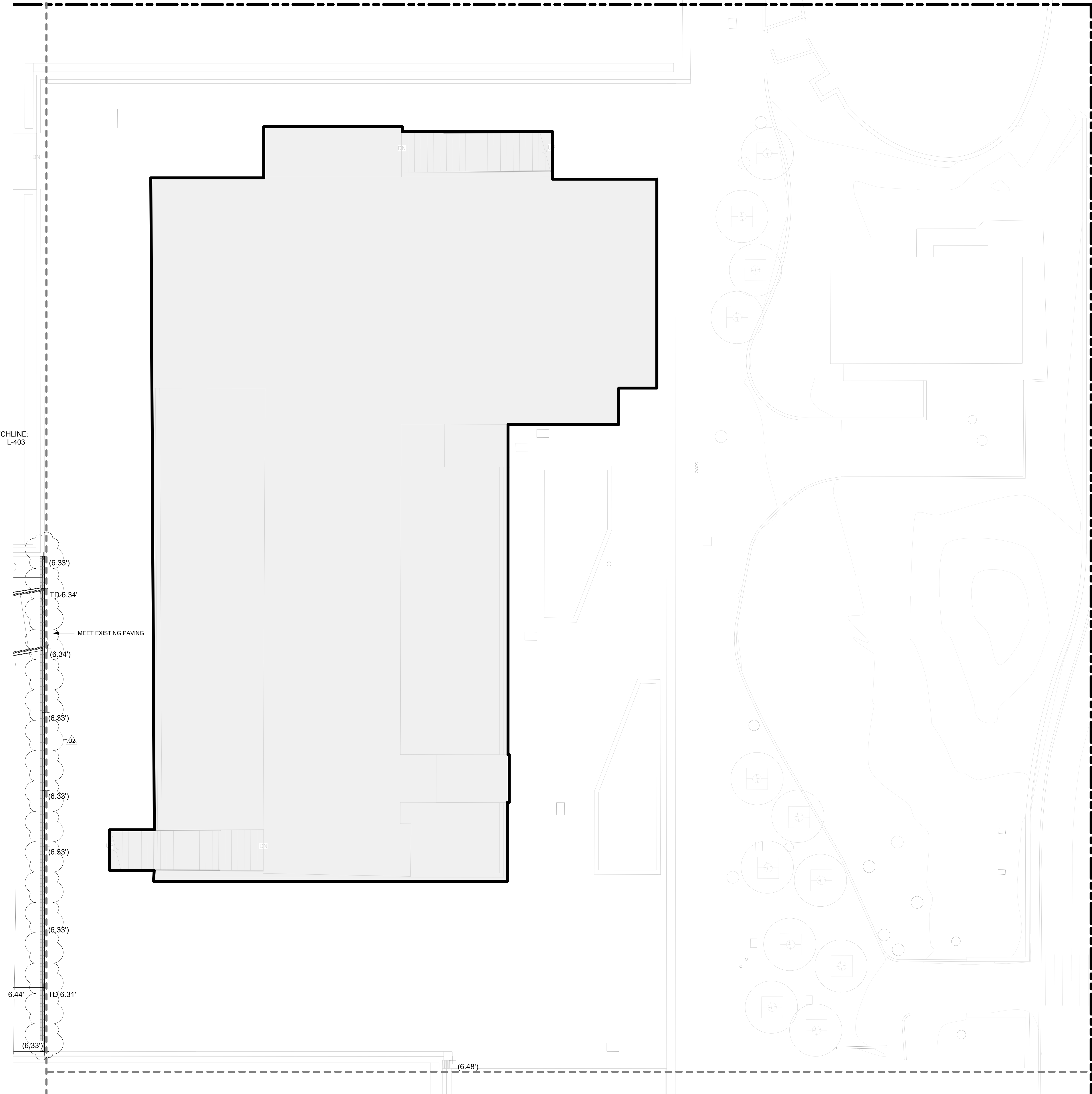
L-404.00

LEGEND

- LIMIT OF WORK
- STRUCTURE OVERHEAD
- MINOR CONTOUR
- MAJOR CONTOUR
- TRENCH DRAIN, SEE 1 / L-511
- SLOT DRAIN, SEE 2 / L-511
- PROPOSED SPOT ELEVATION
- EXISTING SPOT ELEVATION
- SLOPE
- TOP OF WALL
- BOTTOM OF WALL
- TOP OF CURB
- BOTTOM OF CURB

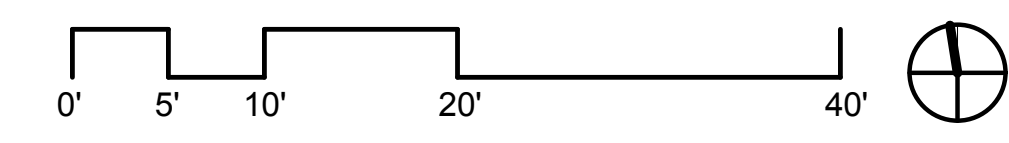
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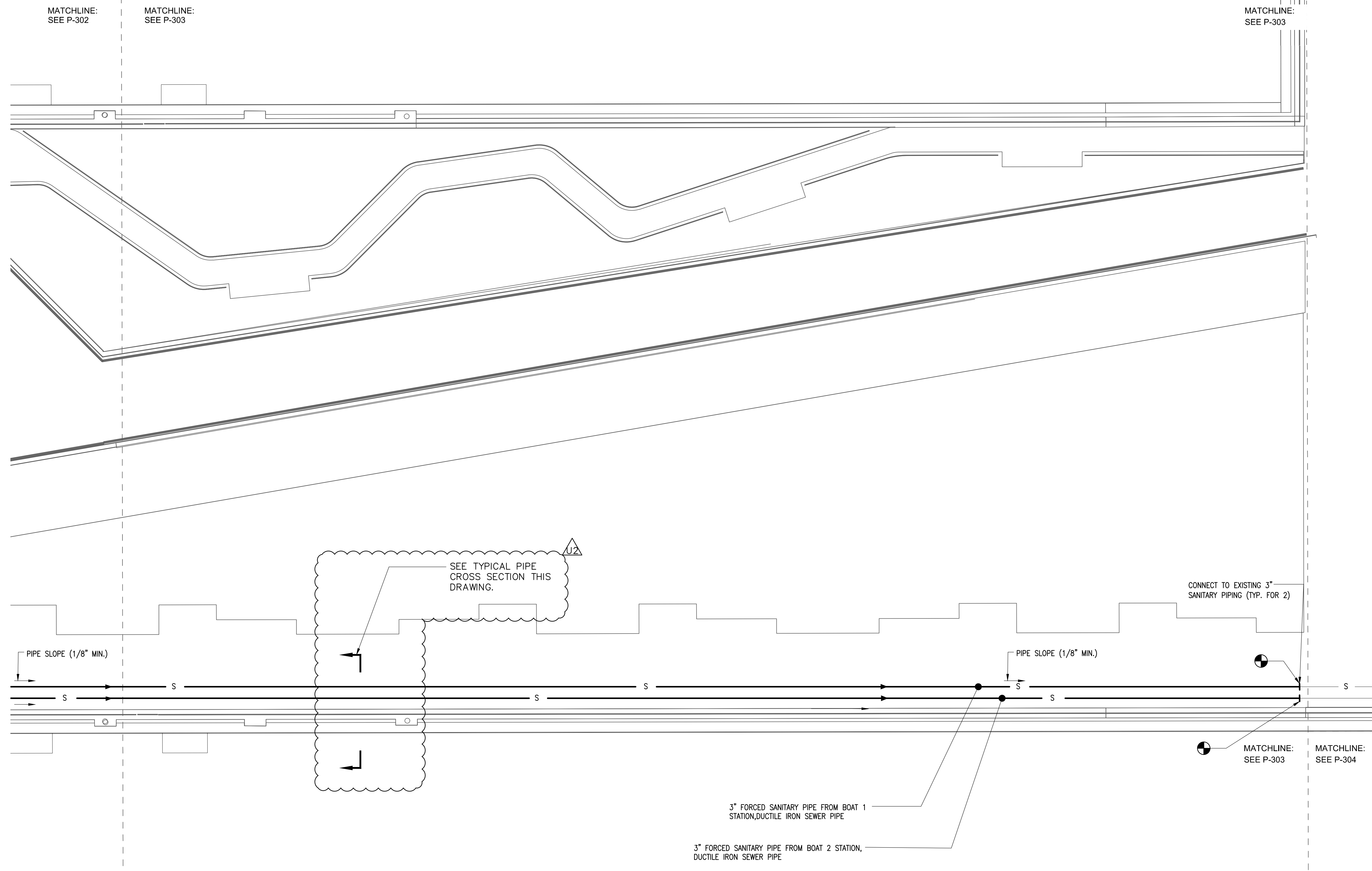
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MATCHLINE:
SEE L-403

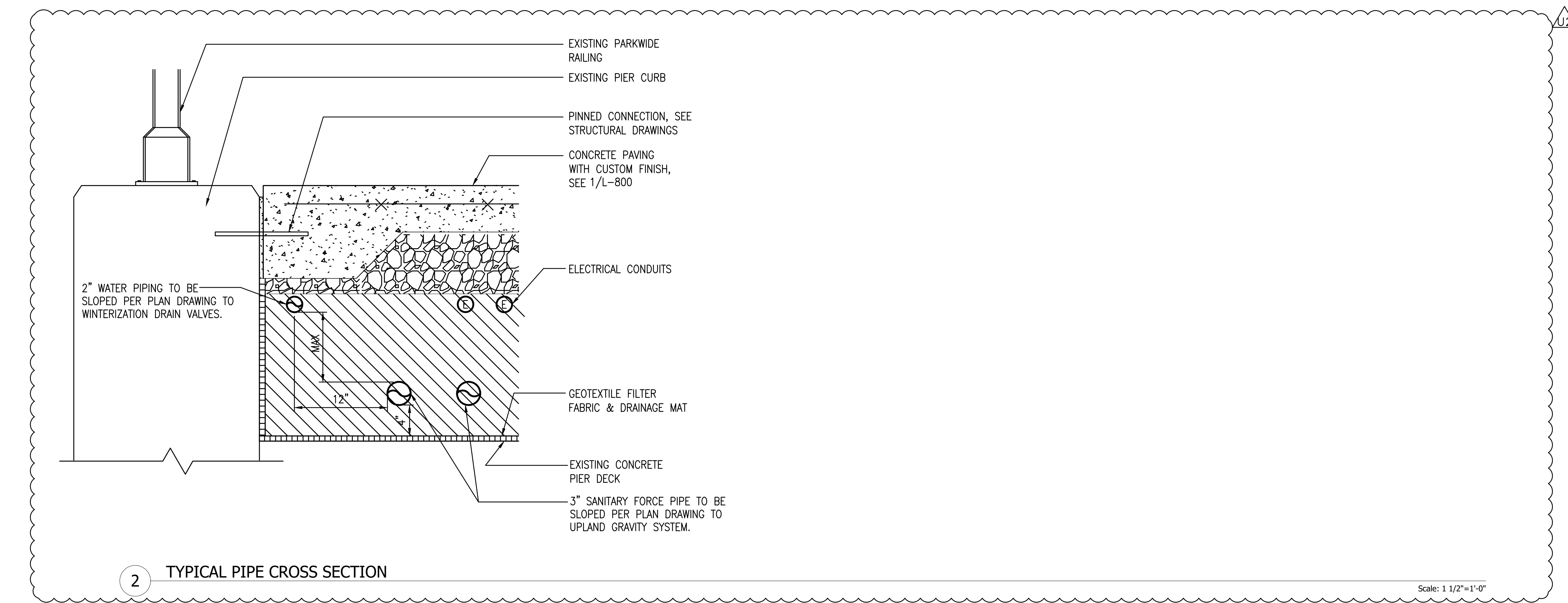
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- TD 6.34'
- MEET EXISTING PAVING
- (6.34')
- (6.33')
- (6.33')
- (6.33')
- (6.33')
- (6.33')
- 6.44'
- TD 6.31'
- (6.33')





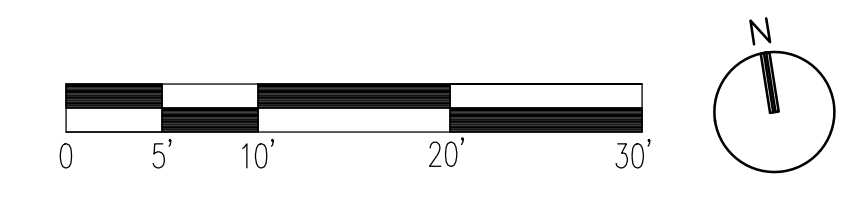
1 SANITARY PIPING PLAN - PIER D

Scale: 1"=10'-0"



2 TYPICAL PIPE CROSS SECTION

Scale: 1 1/2"=1'-0"



Hudson River Park Trust

The Honorable
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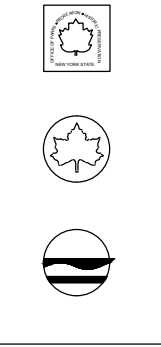
ALICIA GLEN
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MARK SODOS
Commissioner,
New York State Department of
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HUDSON RIVER PARK

Segment 3

PIER 26 UPLAND PARK
CONSTRUCTION

C4891 - A-E

OLIN
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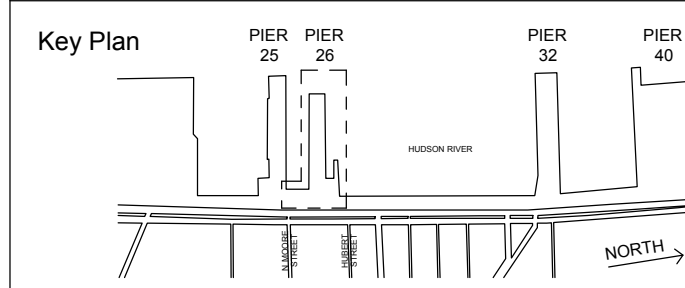
Lighting Designer:
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15 Maiden Lane, Suite 508
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Seal

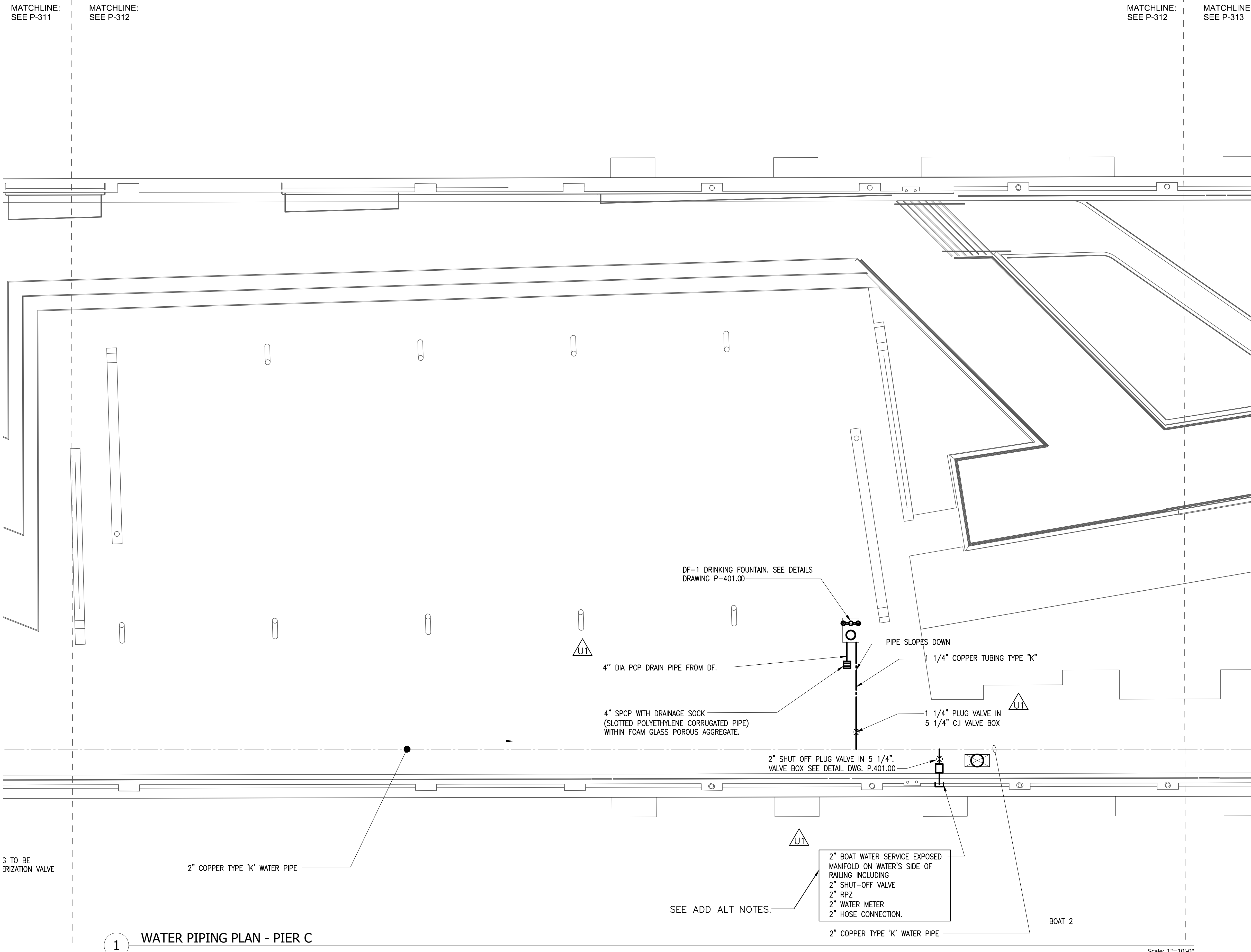
No.	Date	Description
	09/28/2018	ISSUED FOR BID
U2	11/30/2018	ADDENDUM 2



SANITARY PIPING PLAN - PIER D

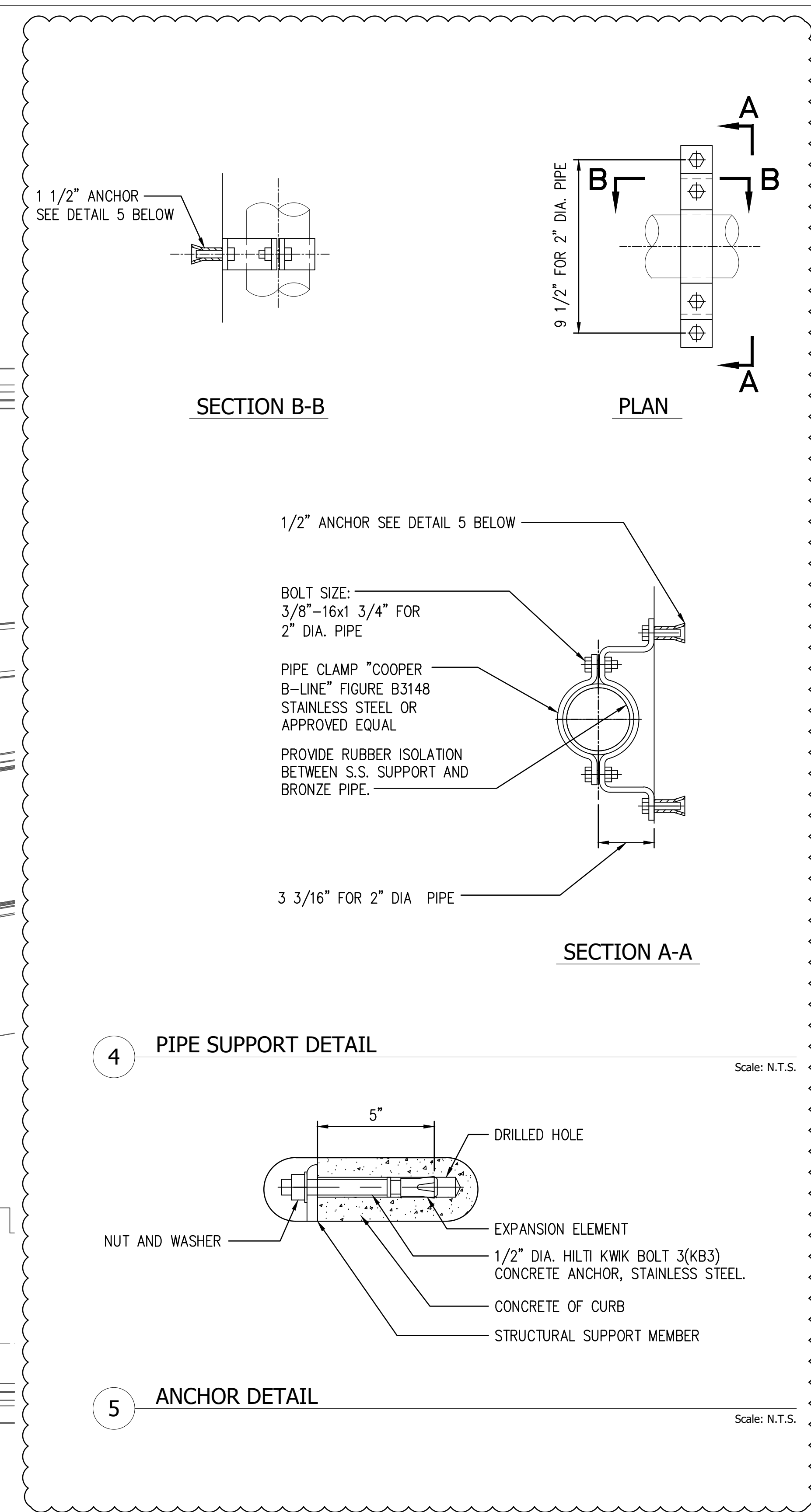
Scale: 1" = 10'-0"
Date: 09/28/2018
Drawn: JR/MA
Checked: BA
Project No.: 1527

P-303.00



1 WATER PIPING PLAN - PIER C

Scale: 1"=10'-0"

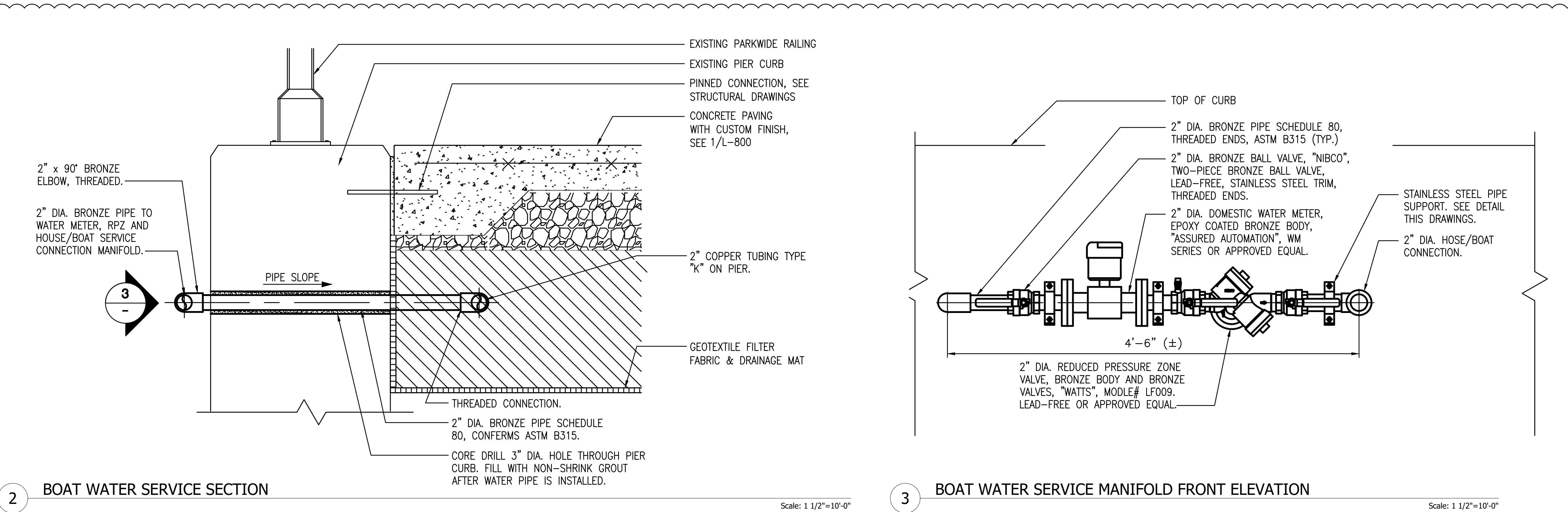


4 PIPE SUPPORT DETAIL

Scale: N.T.S.

5 ANCHOR DETAIL

Scale: N.T.S.

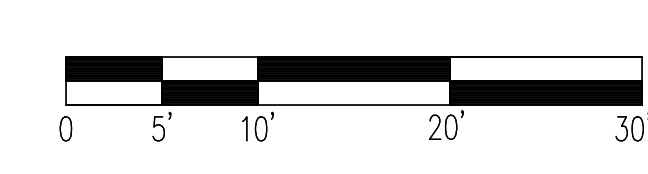


2 BOAT WATER SERVICE SECTION

Scale: 1 1/2"=10'-0"

3 BOAT WATER SERVICE MANIFOLD FRONT ELEVATION

Scale: 1 1/2"=10'-0"



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DALE SODOS
Commissioner,
New York State Department of
Environmental Conservation

HUDSON RIVER PARK

VPS SCALE **Segment 3**

PIER 26 UPLAND PARK CONSTRUCTION

C4891 - A-E

OLIN
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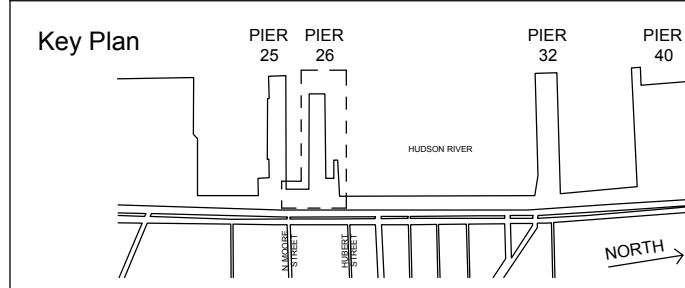
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No.	Date	Description
	09/28/2018	ISSUED FOR BID
U1	11/02/2018	ADDENDUM 1
U2	11/30/2018	ADDENDUM 2



SANITARY PIPING PLAN - PIER C

Scale: 1"=10'-0"

Date: 09/28/2018

Drawn: JR/MA

Checked: BA

Project No.: 1527

P-312.00

HUDSON RIVER PARK

Segment 3

PIER 26 UPLAND PARK CONSTRUCTION

C4891 - A-E

OLIN

LANDSCAPE ARCHITECTURE / URBAN DESIGN / PLANNING
PUBLIC LEADER BUILDING, SUITE 1125
1915 MTH WASHINGTON BLVD, PHILADELPHIA, PA 19103
TEL: 215.480.0000 / FAX: 215.440.0041
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New York, NY 10012
212. 840. 6331

Structural Engineer:
SILMAN
32 Old Slip, 10th Floor
New York, NY 10005
212. 620. 7870

Marine Engineer:
MRCE
14 Penn Plaza
225 West 34th Street
New York, NY 10122
917. 339. 9300

Ecologist:
BIOHABITATS
529 5th Avenue, 14th Floor
New York, NY 10018
646. 876. 9350

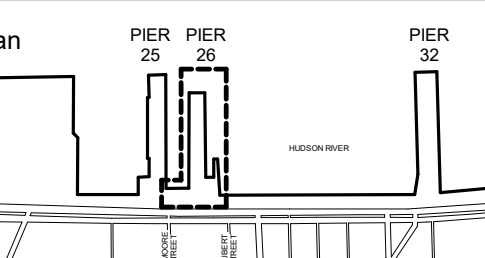
Lighting Designer:
TILLET LIGHTING DESIGN, Inc.
15 Maiden Lane, Suite 508
New York, NY 10038
212. 766. 0144

MEP Engineer:
WESLER-COHEN
740 Broadway
Amityville, NY 11701
631. 789. 8811

Irrigation:
NORTHERN DESIGNS, LLC
2089 Hartford Turnpike
North Haven, CT 06473
203. 239. 2710

Seal

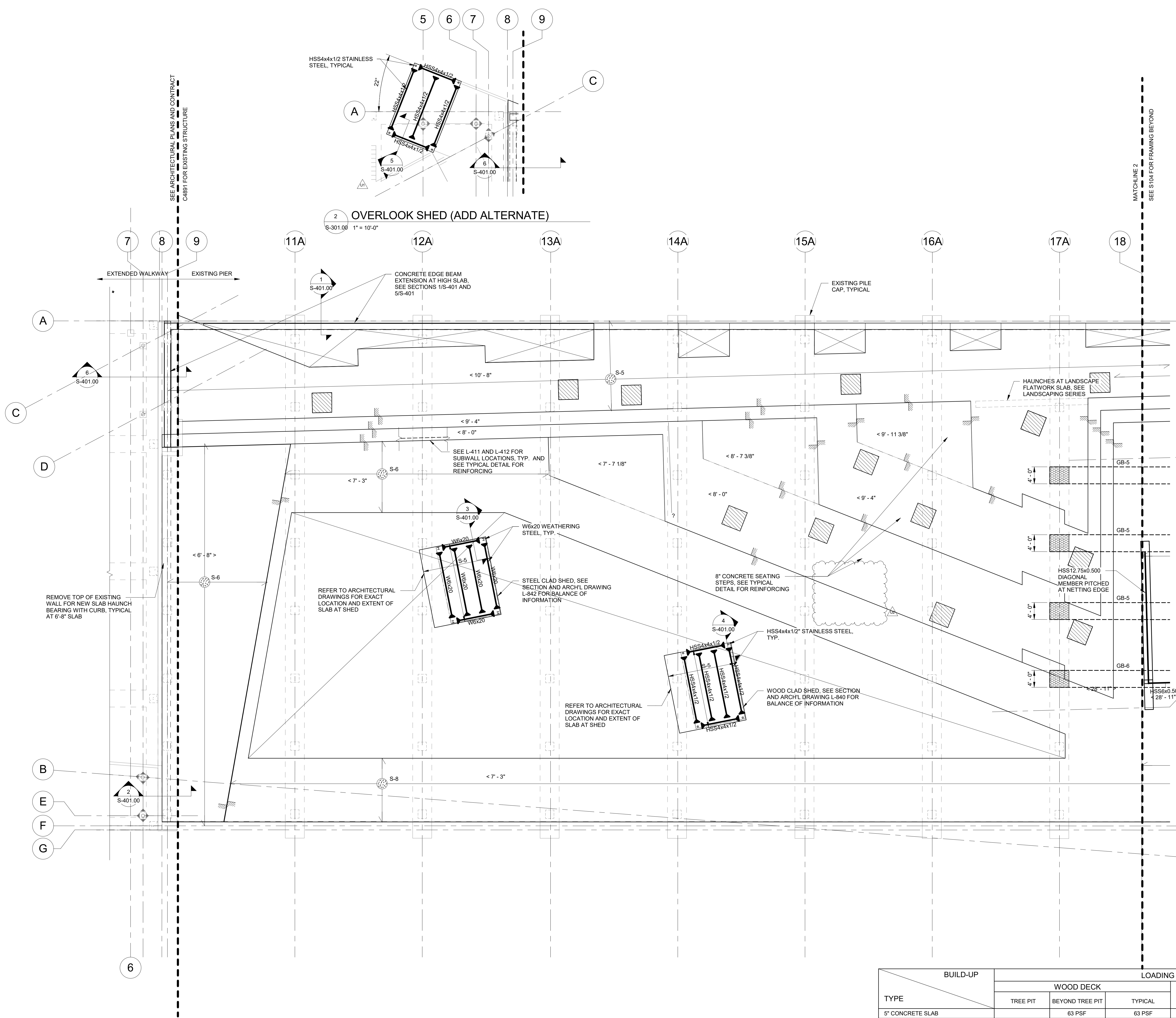
No.	Date	Description
	09/28/2018	ISSUED FOR BID
U1	11/02/2018	ADDENDUM 1
U2	11/30/2018	ADDENDUM 2



FRAMING PLAN - PIER B

Scale: As indicated
Date: 09/27/2018
Drawn: AH/BJ
Checked: IP/NO
Project No.: 1527

S-301.00



LEGEND

- CONCRETE COLUMN
- STEEL COLUMN WITH BASEPLATE BP-1 U.O.N. SEE TYPICAL DETAIL AND BASEPLATE SCHEDULE ON S-402
- STEEL BEAM
- SHEAR CONNECTION
- MOMENT CONNECTION
- INDICATES STEP DOWN
- INDICATES SLOPE DOWN OR UP
- 5' 4000PSI NW CONCRETE PAVING SLAB, SEE TYPICAL DETAIL ON S-400. SEE ARCHITECTURAL DRAWINGS FOR BUILD-UP ABOVE/BELOW SLAB.
- 8' 4000PSI NEW CONCRETE PAVING SLAB, SEE TYPICAL DETAIL ON S-400. SEE ARCHITECTURAL DRAWINGS FOR BUILD-UP ABOVE/BELOW SLAB.
- 5000 PSI NW CONCRETE GRADE BEAMS TO SPAN BETWEEN EXISTING PILE LOCATIONS. SEE BEAM SCHEDULE AND SECTIONS OF S-400 FOR BALANCE OF INFORMATION
- 4'-0"x4'-0" SLAB OPENING FOR TREE PLANTING, SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION
- EXISTING PILE CAP AND PILE BENT, VERIFY EXACT LOCATION IN FIELD
- HAUNCH BEARINGS AT NEW CONCRETE GRADE BEAM END BEARINGS TO EXISTING CONCRETE PILE CAPS. SEE PLANS AND SECTION DETAILS FOR ADDITIONAL INFORMATION

- NOTES:**
- SEE ARCHITECTURAL SLAB LAYOUT PLANS, L-301 TO L-303, FOR ALL ALL ELEVATIONS AND DIMENSIONS NOT SHOWN.
 - T.O. STRUCTURAL STEEL, AS NOTED ON PLAN.
 - SEE S-402.00 FOR TYPICAL DETAILS.
 - ALL REINFORCING TO BE EPOXY COATED, SEE CONCRETE SPECIFICATION.
 - STRUCTURAL STEEL TO BE HOT DIP GALVANIZED, WEATHERING STEEL, OR STAINLESS STEEL AS NOTED ON PLAN. REFER TO STRUCTURAL STEEL SPECIFICATIONS FOR MATERIAL STANDARDS AND OTHER REQUIREMENTS.
 - THE NETTING IS ASSUMED TO INDUCE A TENSION LOAD OF 100 LB/FT AT ALL SUPPORTING MEMBERS. SUPPORTING MEMBERS DESIGN FOR WIND ON ICE LOADING CASE ASSUMING 1/8" DIAMETER THICK NETTING. DESIGN ASSUMPTIONS TO BE VERIFIED WITH NETTING PROVIDER.
 - ALL NEW GRADE BEAMS AT EXISTING PIER ARE DESIGNED TO SPAN BETWEEN EXISTING PILE CAPS, AS THE BEAM LOADS WOULD OTHERWISE EXCEED THE EXISTING PLANK CAPACITY. SEE SECTION DETAILS FOR INSULATION FILL MATERIAL AT BEAM SOFFITS AND HAUNCH BEARINGS ALIGNED WITH EXISTING PILE CAPS.

GOVERNING CODE:		DESIGN PARAMETER TABLE	
WIND LOAD:	110 MPH	BASIC WIND SPEED	
	1.00	I WIND IMPORTANCE FACTOR	
	C	WIND EXPOSURE CATEGORY	
SEISMIC DESIGN:	1.00	I SEISMIC IMPORTANCE FACTOR	
	0.281	Ss SHORT PERIOD SPECTRAL RESPONSE...	
	0.073	S1 1-SECOND PERIOD SPECTRAL RESPONSE...	
	0.94	S1(d) 5% DAMPED SPECTRAL RESPONSE COEFFICIENT...	
	0.117	S1(d) 5% DAMPED SPECTRAL RESPONSE COEFFICIENT...	
	C	SEISMIC DESIGN CATEGORY	

BUILD-UP	LOADING SCHEDULE (PSF)							
	TREE PIT	BEYOND TREE PIT	TYPICAL	CONCRETE WALKING SURFACE	TREE PIT	SHRUB	LAWN	COURT SURFACE
5" CONCRETE SLAB		63 PSF	63 PSF					
WOOD DECK BUILD-UP		7 PSF	7 PSF					
SOLITE (50 PCF)								5 PSF
POWER GAME COURT SURFACE								30 PSF
3" SAND DRAINAGE LAYER	30 PSF	30 PSF	30 PSF	30 PSF	30 PSF	30 PSF	30 PSF	100 PSF
8" CONCRETE SLAB				100 PSF				2 PSF MAX.
HIGH DENSITY FOAM	8 PSF MAX.	12 PSF MAX.	15 PSF MAX.			3 PSF MAX.	3 PSF MAX.	100 PSF (12' HEIGHT.)
GRAVEL (100 PCF)			67 PSF (8" HEIGHT)	67 PSF (8" MAX.)				
GLASS AGGREGATE BUILD-UP (20 PCF)				24 PSF MAX.				
SOIL AT PLANTING (1'-10" MAX. OF 120 PCF - 2'-6" MAX. OF 90 PCF SOIL)	360 PSF (3'-0" HEIGHT)				300 PSF (2'-6" HEIGHT)			
SOIL AT PLANTING (2'-4" MAX. OF 120 PCF - 3'-2" MAX. OF 90 PCF SOIL)		135 PSF (1'-6" HEIGHT)				180 PSF (2'-0" HEIGHT)	135 PSF (1'-6" HEIGHT)	
LIVE LOAD	100 PSF	100 PSF	100 PSF	100 PSF	100 PSF	100 PSF	100 PSF	100 PSF
TOTAL LOAD	498 PSF	347 PSF	282 PSF	321 PSF	430 PSF	313 PSF	350 PSF	337 PSF

NOTES:
E.O.R. TO REVIEW ANY VARIATION IN BUILD-UP ON EXISTING PIER THAN ALLOWABLE LIMITS SPECIFIED IN LOADING SCHEDULE.

1 FRAMING PLAN - PIER B
S-301.00 1" = 10'-0"

The Honorable
ANDREW M. CUOMO
Governor, State of New York

The Honorable
BILL de BLASIO
Mayor, City of New York

The Honorable
GALE A. BREWER
President, Borough of Manhattan

DANAL TAYLOR
Chairman,
Hudson River Park Trust

AJICIA GLEN
Vice Chairman,
Hudson River Park Trust

MADLYN WILS
President,
Hudson River Park Trust

ROSE HARVEY
Commissioner,
New York State Office of Parks,
Recreation and Historic Preservation

MITCHELL J. SILVER
Commissioner,
City of New York
Parks and Recreation

DALE SEGOS
Commissioner,
New York State Department of
Environmental Conservation

HUDSON RIVER PARK

Segment 3

PIER 26 UPLAND PARK CONSTRUCTION

C4891 - A-E

OLIN

LANDSCAPE ARCHITECTURE / URBAN DESIGN / PLANNING
PUBLIC LEADER BUILDING, SUITE 1123
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TEL: 215.480.0000 / FAX: 215.440.0041
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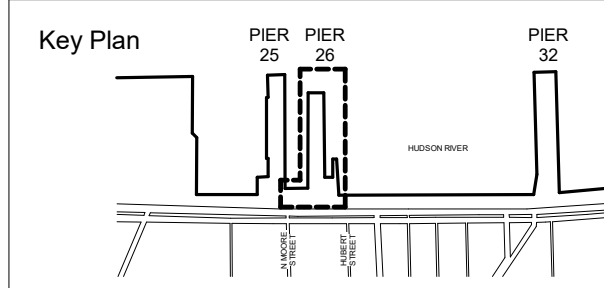
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Seal

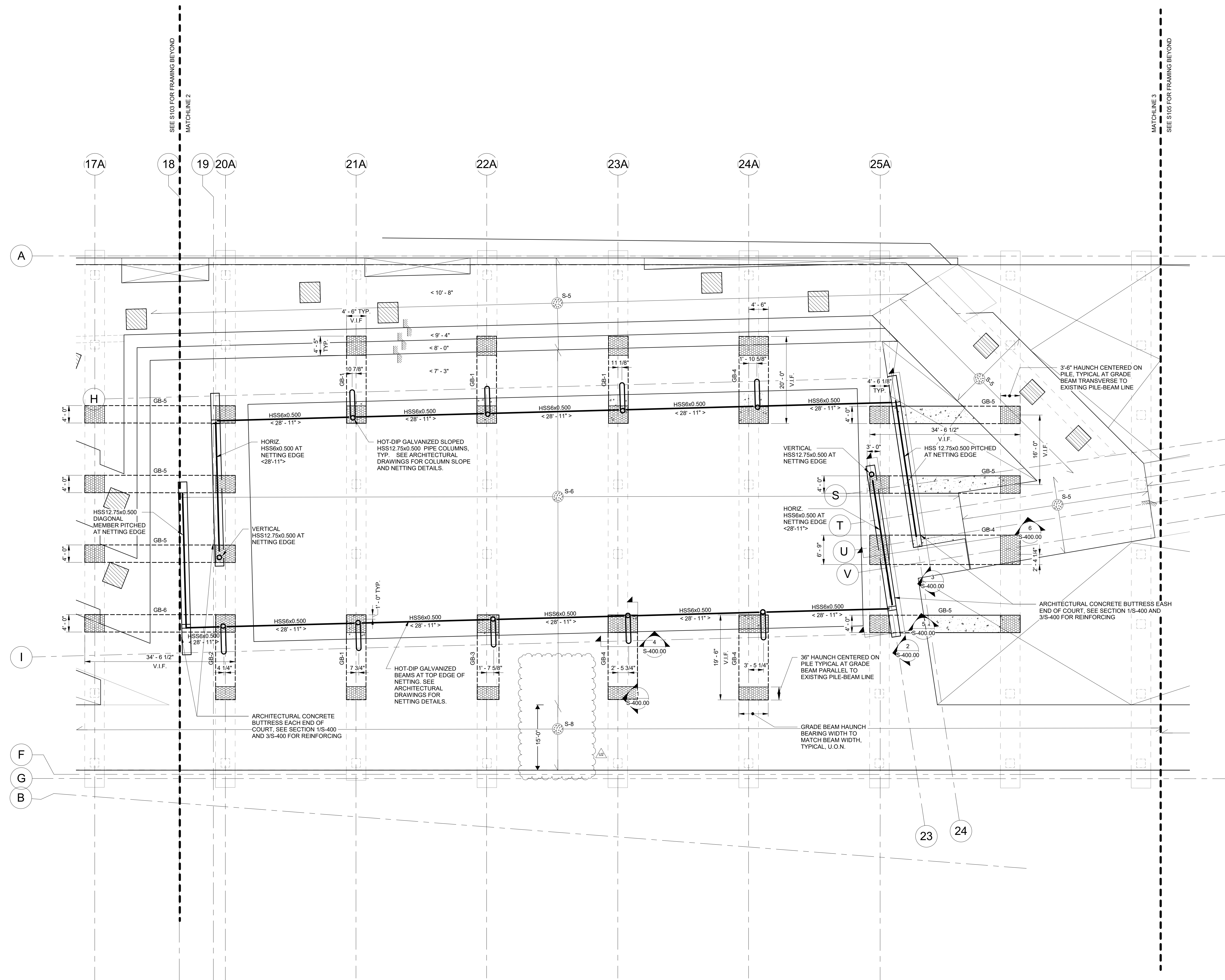
No.	Date	Description
09/28/2018	ISSUED FOR BID	
U2	11/30/2018	ADDENDUM 2



FRAMING PLAN - PIER C

Scale: As indicated
Date: 09/27/2018
Drawn: AH/BJ
Checked: IP/NO
Project No.: 1527

S-302.00



LEGEND

- CONCRETE COLUMN
- STEEL COLUMN WITH BASEPLATE BP-1 U.O.N. SEE TYPICAL DETAIL AND BASEPLATE SCHEDULE ON S-402
- STEEL BEAM
- SHEAR CONNECTION
- MOMENT CONNECTION
- INDICATES STEP DOWN
- INDICATES SLOPE DOWN OR UP
- 6" 6" OR 8" 4000PSI NW CONCRETE PAVING SLAB. SEE TYPICAL DETAIL ON S-402. SEE ARCHITECTURAL DRAWINGS FOR BUILD-UP ABOVE/BELOW SLAB.

GB-X

- 5000 PSI NW CONCRETE GRADE BEAMS TO SPAN BETWEEN EXISTING PILE LOCATIONS. SEE BEAM SCHEDULE AND SECTIONS OF S-400 FOR BALANCE OF INFORMATION
- 4'-0"x4'-0" SLAB OPENING FOR TREE PLANTING. SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION
- SLOPED STEEL COLUMN WITH BP-2, U.O.N. SEE TYPICAL DETAIL AND SCHEDULE ON S-402
- EXISTING PILE CAP AND PILE BENT. VERIFY EXACT LOCATION IN FIELD
- HAUNCHED BEARINGS AT NEW CONCRETE GRADE BEAM END BEARINGS TO EXISTING CONCRETE PILE CAPS. SEE PLANS AND SECTION DETAILS FOR ADDITIONAL INFORMATION

- NOTES:**
- SEE ARCHITECTURAL SLAB LAYOUT PLANS, L-301 TO L-303, FOR ALL ALL ELEVATIONS AND DIMENSIONS NOT SHOWN.
 - T.O. STRUCTURAL STEEL, AS NOTED ON PLAN.
 - SEE S-402.00 FOR TYPICAL DETAILS
 - ALL REINFORCING TO BE EPOXY COATED. SEE CONCRETE SPECIFICATION.
 - ALL STRUCTURAL STEEL TO BE GALVANIZED. REFER TO STRUCTURAL STEEL SPECIFICATIONS FOR MATERIAL, STANDARDS AND OTHER REQUIREMENTS.
 - THE NETTING IS ASSUMED TO INDUCE A TENSION LOAD OF 100 LB/FT AT ALL SUPPORTING MEMBERS. SUPPORTING MEMBERS DESIGN FOR WIND ON ICE LOADING CASE ASSUMING 1/8" DIAMETER THICK NETTING. DESIGN ASSUMPTIONS TO BE VERIFIED WITH NETTING PROVIDER.
 - ALL NEW GRADE BEAMS AT EXISTING PIER ARE DESIGNED TO SPAN BETWEEN EXISTING PILE CAPS, AS THE BEAM LOADS WOULD OTHERWISE EXCEED THE EXISTING PLANK CAPACITY. SEE SECTION DETAILS FOR INSULATION FILL MATERIAL AT BEAM SOFFITS AND HAUNCHED BEARINGS ALIGNED WITH EXISTING PILE CAPS.

1 FRAMING PLAN- PIER C
S-302.00 1" = 10'-0"

MARK	SIZE		REINFORCEMENT				REMARKS
	WIDTH	DEPTH	LONGITUDINAL REINFORCING		TRANSVERSE REINFORCING		
			BOTTOM BARS	TOP BARS	BOTTOM BARS	TOP BARS	
GB-1	54"	14"	7 #5	#4 @ 12" O.C.	#4 @ 12" O.C.	#4 @ 12" O.C.	PROVIDE HAUNCH AT BEAM ENDS, SEE DETAILS
GB-2	54"	14"	7 #6	#4 @ 12" O.C.	#4 @ 12" O.C.	#4 @ 12" O.C.	PROVIDE HAUNCH AT BEAM ENDS, SEE DETAILS
GB-3	60"	14"	6 #6	#4 @ 12" O.C.	#4 @ 12" O.C.	#4 @ 12" O.C.	PROVIDE HAUNCH AT BEAM ENDS, SEE DETAILS
GB-4	81"	14"	8 #6	#4 @ 12" O.C.	#4 @ 12" O.C.	#4 @ 12" O.C.	PROVIDE HAUNCH AT BEAM ENDS, SEE DETAILS
GB-5	48"	14"	7 #7	#4 @ 12" O.C.	#4 CLOSED TIES @ 6" O.C.	#4 @ 12" O.C.	PROVIDE HAUNCH AT BEAM ENDS, SEE DETAILS
GB-6	48"	18"	10 #8	#4 @ 12" O.C.	#4 @ 12" O.C.	#4 @ 12" O.C.	PROVIDE HAUNCH AT BEAM ENDS, SEE DETAILS

(B) 4. C4981-C Electrical – Specifications – Addendum4.pdf

SECTION 02087 - DUCTILE IRON SEWER PIPE

PART 1 - GENERAL

REISSUED AS PART OF ADDENDUM #2

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Work of this Section includes providing new installations and related components of ductile iron piping for sewer lines as indicated for Project. Include fittings and pipe joining to complete work as shown on the Contract Drawings and/or specified herein.
- B. Related Sections include the following:
 - 1. Division 2 Section 02080 “Piped Utilities” for accessory items related to site plumbing work and references to related Sections of other on-site work.
 - 2. Division 2 Section 02232 “Site Preparation, Demolition, and Removals” for removing miscellaneous on-site elements.
 - 3. Division 2 Section 02085 “Manholes and Drainage Structures”.
 - 4. Division 2 Section 02300 “Earthwork” for trenching, backfilling, compacting and compaction testing, and with specifications for different soil types.
 - 5. Division 2 Section 02531 “On Pier Sewer Lift Station” for ejector equipment in lift station pit structures and related pit covers on Pier 25.
 - 6. Division 3 Section 03300 “Cast-In-Place Concrete” for placing on-site cast-in-place concrete work.

1.3 SUBMITTALS

- A. General: Refer to and comply with Division 1 Section 01330 “Submittal Procedures”, for procedures and additional submittal criteria.
 - 1. Relate to and arrange submittal requirements of this Section together with Division 2 Section 02080 “Piped Utilities”.
- B. Product Data: Submit manufacturer’s technical product data and specifications including dimensions and coatings. Include Statement of Compliance with ANSI/AWWA Specifications.
- C. Coordination Drawings: As specified in Division 2 Section 02080 “Piped Utilities”.

1.4 REFERENCES AND STANDARDS

- A. American National Standards Institute (ANSI).
- B. American Water Works Association (AWWA):

HUDSON RIVER PARK – SEGMENT 3**PIER 26 UPLAND PARK Construction**

1. C104 Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water.
2. C110 Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In., for Water and Other Liquids.
3. C111 Rubber Gasket Joints for Ductile Iron Pressure Pipe and Fittings.
4. C151 Ductile Iron Pipe, Centrifugally Cast, for Water or Other Liquids.

1.5 QUALITY ASSURANCE**A. Material Markings:**

1. Piping materials shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS**2.1 DUCTILE IRON PIPE****A. Provide centrifugally cast ductile iron piping in accordance with ANSI/AWWA C151/A21.51.**

1. Grade: 60-40-10.
2. Thickness Class: ~~56~~ 51.
3. Joints: Mechanical or Push-on; comply with ANSI/AWWA C111/A21.11.
4. Pipe Laying Lengths: Not to exceed 20 feet.

B. Coating and Lining:

1. Outside Coating: Bituminous enamel, minimum thickness one (1) mil. applied hot in conformity with AWWA 203.
2. Inside Lining: Cement mortar, 1/8 inch minimum thickness; complying with ANSI/AWWA C104/A21.4.

2.2 FITTINGS**A. Ductile Iron: Comply with ANSI/AWWA C110/A21.10.****B. Joints: Match pipe type furnished.**

1. Push-on Joints: Provide push-on joints Super Bell-Tite Joint by Amstead Industries, Tyton Joint by US Pipe and Foundry Co., Fastite Joint by American Cast Iron Co., or approved equal.
 - a. Each bell shall be rubber gasketed conforming to AWWA/ANSI C111/A21.11.
2. Mechanical Joints: Conform mechanical joints to AWWA/ANSI C111/A21.11. Applied torque shall be as approved.

C. Coating and Lining:

1. Outside Coating: Bituminous enamel, minimum thickness shall be one (1) mil. applied hot in conformity with AWWA 203.
2. Inside Lining: Cement mortar, 1/8 inch minimum thickness; complying with ANSI/AWWA C104/A21.4.

HUDSON RIVER PARK – SEGMENT 3

PIER 26 UPLAND PARK Construction**PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Material Inspection: Inspect pipe and fittings prior to installation to preclude installation of defective materials.
- B. Verification of Existing and Proposed Elevations: Verify all joining elevations prior to laying pipe.

3.2 INSTALLATION

- A. General:
 - 1. Unless otherwise shown, or specified, install ductile iron pipe and fittings in accordance with the pipe manufacturer's printed instructions.
 - 2. Adjacent Facilities and Services: Sewer lines shall not be laid in the same trench with water lines, gas lines, fuel lines, or electrical wiring.
- B. Excavation and Backfill: Relate to and arrange excavating, trenching, and backfilling together with work as specified in Division 2 Section 02300 "Earthwork". Comply with specified requirements for trenching, bedding, and use of soil materials.
- C. Laying Pipe:
 - 1. Lay pipe to line and grade with joints close and even. Excavate adequate bell holes to facilitate joint assembly and to permit a uniform bearing on undisturbed earth for the pipe barrel.
 - 2. Keep the trench free from water. Do not lay or test pipe in a wet trench.
 - 3. Use clamps, tie-rods, lugged pipe, etc., for anchorage when required and as approved.
- D. Pipe Joints:
 - 1. Push-on Joints: Make joints with a rubber ring and sterile lubricant. The materials used shall be free of water, oil, tar, grease, or other foreign substances.
 - 2. Mechanical Joints: Conform strictly to the manufacturer's instructions with particular reference to gland alignment and the tightening of the bolts. Over stressing bolts to obtain tightening shall not be allowed.
- E. Cutting: Cut pipe at right angles to the axis with sharp tools. Prepare ends for proper connections. Do not lay cut pipe within three lengths of a bend or the end of a line without written approval.
- F. Protecting Pipe:
 - 1. Keep pipe clean from all sediment, debris, packing material and other foreign material.
 - 2. Close all open ends of pipes and fittings securely with removable plugs at end of each work day, during storms, and when the Work is left at any time.

3.3 CONNECTIONS

- A. When other connecting pipe or other connecting structures have not yet been installed, lay pipe to a point where directed and plug or cap the end. Identify the terminal point with a stake extending above ground, marked to indicate size and service. Provide temporary thrust restraint as approved.

029

C4891C - Addendum No. 4 - 12/03/2018

HUDSON RIVER PARK – SEGMENT 3

PIER 26 UPLAND PARK Construction

END OF SECTION 02087

SECTION 02300 - EARTHWORK

PART 1 - GENERAL

REISSUED AS PART OF ADDENDUM #2

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Work of this Section includes conducting unclassified excavation in bulk and in trenches/pits, filling and backfilling with specified soil materials, compacting, grading, and the following:
 - 1. Earthwork shall occur within, around, and for site conditions as required to provide foundation elements, appurtenant structures, sub-bases and base courses, site landscaping and improvements, utility lines, and other miscellaneous elements of respective work. Earthwork shall further include:
 - a. Protection of excavations, utilities, adjacent conditions, and previously installed work of the Project to remain.
 - b. Designing, furnishing, installing, and removing temporary excavation supports, dewatering, and other temporary protection including erosion control required for and incidental to performing and maintaining earthwork.
 - c. Preparing sub-grades and placing base / sub-base courses for utility structures and related distribution lines, wall systems, pavement systems, and site drainage systems.
 - d. Placing fill/backfill materials including, but not limited to, the following:
 - 1) Include EPS geofoam fill materials at locations indicated on Pier 26 Drawings.
 - 2) Coarse Sand material, Lightweight Aggregate, and Foamed Glass material as indicated at and around foundation areas of structures and for utility trenches and utilizing Sand and Gravel Mix material for site porous/perforated pipe Under Drainage (Subdrainage) Systems.
 - 3) Bedding Sand material around utility lines and at where indicated.
 - 4) Sand drainage material over EPS fill including filling of through EPS vertical drains/weeps.
 - 5) Drainage layer material after completion of Under Drainage (Subdrainage) Systems in preparation for subsequent planting soil installations.
 - e. At lawn and planting areas, include placement of horticultural fill material related to and arranged together with requirements respective to the soil materials specified and their design location.
 - f. Grading and compacting of site filled and backfilled areas to design grades with allowance for design thicknesses of planting soils, paving systems, and the like, and allowing for even flow of grade transitions to adjacent site areas.
 - 1) Assist with on-site soil compaction testing that will be by Owner engaged Testing Agency / Laboratory to confirm uniform compaction at locations of new footings and at site areas to receive structures, pavement systems, and planting soil installations.

HUDSON RIVER PARK – SEGMENT 3**PIER 26 UPLAND PARK CONSTRUCTION**

2. Use of soil materials properly segregated during excavation operations shall be only as approved by the Owner.
3. Obtaining imported (borrow) material from off-site sources to extent required and of materials specified and tested for approved use in earthwork operations.
 - a. Soil materials specified in this Section include the following:
 - 1) Sand and Gravel Mix material for use with installation of Under Drainage Subdrainage) System as porous/perforated pipe filter.
 - 2) Washed Gravel material for use as sub-base course on grade, at Marine Platform, and at other conditions indicated.
 - 3) Aggregate for use as base course over Washed Gravel sub-base course at Marine Platform pavement conditions as indicated.
 - 4) Bedding Sand material.
 - 5) ESCS aggregate
 - 6) Foamed glass aggregate
4. Providing light-weight EPS geofoam block and/or planar fill systems as approved with drainage accessories over existing waterfront structure (Pier decks).
 - a. Expanded Polystyrene (EPS) rigid cellular polystyrene Geofoam fill for different locations on Piers as indicated on the Drawings.
 - b. Drainage Mats over existing waterfront structure (Pier decks and related elements) on horizontal and vertical surfaces (Pier deck and related elements).
5. Providing accessory materials including items related to other work of Contract and respective Sections of Work. Accessories include but may not be limited to the following:
 - a. Filter and soil separation fabrics.
 - b. Aeration drain system at Structural Soil for tree pit areas.
 - c. Utility warning tapes.
 - d. Herbicides.
 - e. Soil protection fencing system (for temporary use).
6. Field survey work including staking out lines and grades, topographic surveys, verification of job site elevations, and other identification of site work locations. Refer also to Section 01700 “Execution Requirements” for additional survey requirements.
 - a. Include detailed topographic survey of Pier 26 waterfront structure deck for establishing site specific fabrication requirements of EPS fill material. Obtain “as built” survey of pier construction from Construction Manager and use, after confirmation of data shown, as a base document for new work of this Contract.
7. Providing Field Samples/Mock-ups for filling, grading, and compaction of different fill soil installations and for other conditions as specified including mock-up installations for paving systems.
8. Preservation and protection of existing and concurrently installed site work and building structures including related structures, curbs, Bikeway walls, decorative surfaces and pavements, in-place soil materials, and utilities.
 - a. Perform hand excavation and hand backfilling within new and existing to remain planting and paving areas and at other conditions as required to limit damage and protect adjacent finishes.
 - b. Provide temporary soil protection fencing for restricting perimeter access to graded planting soils in areas of proposed planting beds.

HUDSON RIVER PARK – SEGMENT 3**PIER 26 UPLAND PARK CONSTRUCTION**

9. Disposal of excess and unsuitable soil or other materials resulting from earthwork operations.
10. Coordinating this work between and together with related work of Contract and with adjacent work of separate contractors, including sequencing and scheduling of construction operations and use of site areas.

B. Related Sections include the following:

1. Division 1 Section “Temporary Facilities and Controls” for provisions of on-site vehicle wash down area, maintenance of temporary access conditions, additional dewatering and protection requirements, and other site related facilities and controls.
2. Division 1 Section "Execution Requirements" for survey preparation, verifying utility locations, and for recording field measurements and as found item locations.
3. Division 2 Section “Piped Utilities” for additional plumbing and civil utility work provisions and with references to other Related Sections of other on-site plumbing work.
4. Division 2 Section “Site Preparation, Demolition, and Removals” for disconnecting, capping or sealing, and removing utility services; site clearing and selective site demolition; and for; removal and disposal of debris/obstructions interfering with new work and removing miscellaneous on-site elements.
5. Division 2 Section “Site Water Services and Distribution” with general requirements for water line installations with references to Related Sections and with additional requirements for earthwork.
6. Division 2 Section “General Provision for Site Electrical Work” for new electrical utility, distribution, element installations, adjustment of existing electrical manholes and pull boxes and with references to other Related Sections of electrical work.
7. Division 2 Section “Planting Drainage Systems” for drainage systems and under drainage (sub-drainage) systems at planting bed areas.
8. Division 2 Section “Metal Edging” for steel edging at planting and stabilized stone dust paving.
9. Division 2 Section “Site Irrigation” for selected underground water irrigation piping and control wiring installation.
10. Division 2 Section “Soil Preparation and Mixes” for fill and planting soil component materials, planting soil mixes, and requirements for related soil material testing.
11. Division 2 Section "Exterior Planting" for finish grading, planting installations including related excavating and backfilling, fertilizer and soil amendment requirements, and plant maintenance.
12. Various other Division 2 Sections for utility systems, materials not listed, and with additional requirements for earthwork.
13. Division 3 Section "Cast-In-Place Concrete" for site cast-in-place concrete footing/foundation systems, base slabs, and related finishing work.
14. Division 4 Section “Miscellaneous Stone” for landscape boulders, granite inserts, and aggregate fill for eco area.

1.3 DEFINITIONS

- A. Backfill: General reference for soil materials to be used and the operation to fill an excavation.
 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Base Course: Layer placed between the compacted sub-grade and structure or paving system.
- C. Bedding Course: Layer placed over the excavated sub-grade in a trench before laying pipe and/or conduit.
- D. Borrow: Suitable soil or washed gravel imported from off-site for use as fill or backfill material.
- E. Bulk Excavation: Excavation of soils and unclassified or classified materials in any areas not defined as trench or pit excavation.

HUDSON RIVER PARK – SEGMENT 3**PIER 26 UPLAND PARK CONSTRUCTION**

- F. Debris and/or Obstructions: See definition in Division 2 Section 02232 “Site Preparation, Demolition, and Removals”.
- G. Design Bearing Grades or Elevations: The design vertical levels of foundation bottoms indicated by Contract Documents.
- H. Excavation: Removal of unclassified or classified material encountered above design sub-grade elevations.
1. Additional Excavation: Excavation below design sub-grade elevations as directed by Landscape Architect or Construction Manager. Additional excavation and replacement material will be paid by Owner according to Contract provisions for changes in the Work.
 2. Unauthorized Excavation: Excavation below design sub-grade elevations or beyond indicated dimensions without direction by Landscape Architect or Construction Manager. Unauthorized excavation, as well as remedial work directed by the Landscape Architect or Construction Manager shall be without additional compensation.
- I. Excavation Grades or Elevations: The design vertical levels specified or indicated by Contract Documents or revised during construction by Landscape Architect or Construction Manager to accommodate field conditions and to which excavation shall be conducted.
- J. Finish(ed) Grade: Elevation of top most surface indicated by Contract Documents for hardscape surfacing such as paving areas, for planting soil including planting soil surface at planting bed areas.
- K. Pit Excavation: Small, local excavations, such as for utility structures, column footings, pile caps, and other item footings where the plan dimensions do not exceed 10 feet in either length or width.
- L. Sub-grade: Surface or elevation of subsoil remaining after completing excavation before placing utility component bedding, Drainage Layer, Structural Planting Soil, or planting soil layers or top surface of a fill or backfill immediately below a base course or sub-base. Typically a Design Bearing Grade or Excavation Grade.
- M. Suitable Fill Materials: Classified as specified for each type and condition of use such as described in Part 2 “Products” of this or other related Section.
- N. Trench Excavation: Excavations where the required depth is greater than twice the width such as required for installation of utilities and pipes.
- O. Unclassified Excavation: Removal of materials encountered within the required excavations between the existing ground surface and design excavation grade to the top of suitable sub-grade material, whichever is deeper, regardless of the nature of the materials encountered, their geologic definitions, the water contents thereof, and the means of excavation required. Resultant Unclassified Excavation material will be further classified as "Suitable Fill Material" or "Unsuitable Material". Classification of material(s) shall be approved by the Landscape Architect whose decision shall be final and binding upon Contractor.
- P. Unsuitable Material(s): Whenever the words "Unsuitable Material" or words of similar meaning are used, they are taken to include combustible, organic and frozen materials, vegetation, bricks, ashes, wood, cinders, trash, snow, ice and fill previously placed on the site in an uncontrolled manner or with "uncontrolled material", material with excessive water content, material with an inability to obtain necessary compaction, and material which is not in conformance with approved test results of "Suitable Fill Material". Classification of material(s) shall be approved by the Landscape Architect whose decision shall be final and binding upon Contractor.
- Q. Utilities: Existing and proposed new utilities including on-site underground pipes, conduits, ducts, and cables, wiring, or other underground services on-site or within buildings.

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- A. General: Refer to and comply with Division 1 Section 01330 “Submittal Procedures”, for procedures and other submittal criteria.
1. Coordinate with submittal requirements specified for fill soil materials in Division 2 Section 02910 “Soil Preparation and Mixes”.
- B. Qualifications:
1. For Testing: Submit qualifications and resume of Contractor’s Soils Testing Laboratory/Agency proposed to be utilized for soil material testing of this Section. Reference and comply with related requirements specified in Part 1 Article “Quality Assurance” of Section 02910 “Planting Soil Mixes”. Advise if material testing to be performed is proposed to be by the same or different entity.
 2. For Fill Soil Installation Work: Submit to confirm requirements specified in Part 1 Article “Quality Assurance” of this Section.
 3. For EPS Geofoam Installation Work: Submit to confirm requirements specified in Part 1 Article “Quality Assurance” of this Section.
- C. Product Data: Submit to include and confirm material sizes, performance criteria, composition, and other characteristics for the following:
1. Imported bedding, fill, and backfill material of each type specified in this Section.
 2. EPS fill material and related lateral restraint components. Include instructions for field handling, protection, and cutting of EPS fill.
 - a. Submit confirmation that EPS geofoam fill (blocks and/or planar) for Project will be produced by a manufacturer with an in-place, third party certification, Quality Control Program that is monitored by an independent testing organization.
 - b. Include copies of the third party certified test report(s) showing that the EPS geofoam fill material meets the physical properties and standards required and/or specified.
 3. Drainage mat. Include instructions for field handling, protection, and cutting.
 4. Geotextile and soil separation filter fabric materials, each type with identification of proposed function on Project. Relate to and arrange together with specified requirements of other Sections applying like material.
 5. Each type of plastic warning tape.
 6. Soil protection fencing system (for temporary use).
 7. Submit technical descriptive data for each manufactured or packaged product of this Section. Include manufacturer’s product testing and analysis and installation instructions for manufactured or processed items and materials. Include guaranteed analysis and weight of pre-packaged material as specified for certification of material not pre-packaged.
- D. Shop Drawings:
1. For EPS Geofoam Fill: Submit layout of EPS fill materials in each area and for each condition where required. Identify location for EPS related to pier areas indicated. Show different layers of material type, sizes (including thickness of units), and profiles with relationship to adjacent construction, elevation levels, and overlaying or adjacent planting soil materials, and paving systems with sub-base and base courses.
 - a. Include lateral restraint fasteners between and within EPS units.
 - b. Using topographic survey information, show contour (taper) of existing Pier deck structure. Relate to EPS base condition to suit fit for locations of installation.

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- c. Relate, adjust, and arrange together with work of concrete foundation/footing structures and installation requirements of site utilities, concrete slabs, and appurtenances that run through, under, or over EPS fill.
 - E. Samples: Allow sufficient time for submittal review and confirmation testing and evaluation of material test results by the Landscape Architect before start of earthwork and material procurement.
 1. For Testing: Submit samples of each type of soil, aggregate, and bedding material specified from the proposed source of supply as required for testing (Soil Certification and Analysis) specified herein and for confirmation review of characteristics.
 - a. Submit samples for testing directly to Contractor's soil testing laboratory/agency, a bagged minimum quantity indicated for each test clearly identified for each material type and each source and with copy of transmittal and material type identification to the Construction Manager.
 - b. Submit additional quantities if requested.
 - c. Certification and analysis of horticultural soil materials and amendment materials shall be documented and reported based on testing by a licensed independent agricultural testing laboratory engaged by Contractor using material samples proposed for Project Work and as specified herein. See Article "Quality Assurance" herein for additional criteria.
 2. For Quality Control: Other soil samples shall be submitted as requested by Landscape Architect or Construction Manager or allowed to be taken as required for quality control services by Owner's separately engaged Testing Laboratory.
 3. Samples For Verification:
 - a. Aggregates: Submit a bagged clearly identified 5 pound quantity of each type aggregate material. Submit from each material source if any material is from multiple sources.
 - b. Lightweight Aggregates: Submit a bagged clearly identified 2 pound quantity of each material. Submit from each material source if any material is from multiple sources.
 - c. Plastic warning tape, each type, 24" long.
 - d. EPS fill, 12" cube.
 - e. Drainage mat, 12" square.
 - f. Geotextile and soil separation filter fabrics, each type, 12" square.
- F. Test Reports:
 1. Submit agricultural material test reports as specified herein for confirmation of each soil type specified in this Section and soil material sample tested.
 2. Each soil test report shall include the following as a minimum and such other information required specific to the material tested:
 - a. Date Issued.
 - b. Project Title and names, addresses and telephone number(s) of Contractor and material supplier, and Soil type tested.
 - c. Testing laboratory name, address and telephone number, and name(s) as applicable, of each field and laboratory inspector.
 - d. Date, place, and time of sampling or test, with record of temperature and weather conditions.
 - e. Location of sampling material source.
 - f. Type of test including ASTM reference and/or written description of testing parameters used.
 - g. Particle size analysis/distribution as defined below as well as by hydrometer method.
 - h. Particle size analysis report for each soil type shall include the material gradation(s) and shall indicate percent passing and retained together with Dimension Class.
 - i. Cation exchange capacity.
 - j. Results of tests including identification of deviations from acceptable ranges. Identify any toxic substance(s) harmful to plant growth or life.

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- k. Organic matter content.
 - l. Percolation test describing the material drainage rate percentage passing and retained.
 - m. Hydrometer Test describing percentage of sand, clay, and silt.
 - n. Bulk Density.
 3. Include Laboratory compaction curve according to ASTM D1557 (Modified Proctor) for each existing on-site or borrow soil material of this Section proposed for bedding, fill and backfill.
- G. Equipment Data: Submit descriptive information including wheel type and load data for each proposed item of equipment to be used for execution of earthwork and related operations of Contract work. Equipment Data will be evaluated for conformance to site restrictions of use and shall show selection of equipment type to maximize protection of horticultural soil installations.
 1. Include identification of operation function for each type of equipment to be used including but not limited to the following:
 - a. Bulk, trench, and pit excavation to sub-grade and/or design elevation.
 - b. Handling and transporting soils on site.
 - c. Utility and structure backfilling.
 - d. Placing, compaction, and grading of the different soils types and layers.
 - e. Grading of aggregates and soils around new and existing structures.
 - f. Finish grading of soils in lawn and planting bed areas.
 2. Reference Part 3 Article “General Execution Requirements” for additional equipment criteria.
- H. Work and Protection Plans And Related Scheduling:
 1. Schedule and Protection Plan: Submit a detailed plan prior to any site clearing or excavation work for scheduling and sequencing of all Contract work and for protection of horticultural soil mixes and other completed work including coordination with separate contractors on-site or requiring access through the site. Relate to and arrange together with submittal requirements of Division 2 Section 02232 “Site Preparation, Demolition, and Removals”. Indicate the following with schedules and work plans:
 - a. Utilization and maintenance of protection measures for subsoil (sub-grade level) and fill and/or horticultural planting soil surfaces at proposed planting bed installation areas. Indicate use of specified soil protection fencing with restriction for access and restrictions for use of equipment types until, whichever occurs sooner, Contract Substantial Completion or until responsibility for protection is realized by Owner’s separate Pier 26 - Landscape Materials Contractor (C4480) performing lawn sodding and planting work.
 - b. Utilization of finished work protection measures over the work area of construction operations concurrent with all construction operations until Contract Substantial Completion.
 2. On-site Soil Storage: Submit locations, means and methods for storage/stockpiling of soil materials on-site. Reference Part 1 Article “Delivery, Storage, and Handling” herein.
 3. Soil Placement, Compaction, and Settlement Plans: Settlement Methodology: Submit a plan of implementation with a schedule describing the proposed methods intended for placing horticultural planting soils, compaction of each lift and soil layer, and for allowing natural settling of installed soils.
 - a. Relate operational plans together with submitted “Equipment Data”.
 - b. Include preparation of a drawing(s) to show location(s) of proposed Mock-ups (see Article “Quality Assurance” herein) with conditions of installation, materials, and placement method(s) to be used for each mock-up.
 - c. After mock-up installations, re-submit drawing(s) to record any deviations from materials or methods used, other conditions that may have affected placement, observed natural

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settlement, and to record locations of each on-site compaction test reported by Owner's Testing Laboratory / Agency.

I. Certificates:

1. Submit certified analysis for each soil treatment and amendment material to be used and not submitted as Product Data pre-packaged material. Include guaranteed analysis and weight of material as delivered to site of work. Analysis shall be by a recognized laboratory according to methods established by the Association of Official Analytical (Agricultural) Chemists.
2. Foamed glass aggregate: Prior to material delivery to project site, the Contractor shall provide the Owner or Owner's Representative with a written certification or manufacturer's quality control data which displays that the products meet or exceed the values specified herein.
3. Herbicides: Prior to the use on site of any chemical weed control materials, submit a list of the weed control materials and quantities per acre intended for use in controlling the weed types expected on the site. Submittal shall include data demonstrating the compatibility of the weed control materials and methods of installation or application with the intended planting and seed varieties.
4. Certificates of Supply: Upon delivery of soil materials (including bedding and aggregate material) to Project Site include Certificate of Supply together with Supplier material tickets for each soil material load delivered to site.

J. Survey Drawings:

1. Include Certifications of Elevations as specified in Part 3 Article "Field Quality Control" herein. Submit during soil placement operations and at completion.
2. Prepare and submit as additionally specified in Division 1 Sections 01700 "Execution Requirements" and 01770 "Closeout Procedures".

K. Data Submitted for Information and Reference:

1. Copies of permits necessary to transport materials off site.
2. Location of legal disposal sites for waste materials of this Project.

1.5 QUALITY ASSURANCE**A. Inspections and Testing of Earthwork:**

1. Materials Testing: Contractor shall engage and pay for the services of a qualified Soils Testing Laboratory/Agency to perform materials testing and inspections of Project related earthwork. Qualifications of Contractor's Testing Laboratory/Agency shall be submitted to and approved by Landscape Architect prior to the start of soil material procurement and earthwork operations on Project.
 - a. Reference, relate together, and comply with additional qualification criteria and list of acceptable Soil Testing Laboratories specified in Division 2 Section 02910 "Soil Preparation and Soil Mixes".
 - b. Include material testing and certified reporting of on-site existing soils; bedding, fill and backfill materials specified in this Section; material replacements; and, if questionable material conditions, as additionally directed by the Landscape Architect .
 - c. Materials Source Testing: Tests of import (borrow) material shall be made prior to borrow material delivery, and test reports submitted and approved by Landscape Architect prior to delivery or use on site.
 - 1) A minimum of 5 tests shall be made from samples taken at random at each material source with report submitted of each analysis. Landscape Architect and/or

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- Contractor's Testing Laboratory / Agency may, at their discretion, direct random selection at source.
- 2) Each soil type specified in this Section, minimum 1 gallon bag. packaged. Submit additional quantity, if requested.
- d. Materials Field Testing: Tests of material as delivered on site will be required to be made from time to time, the circumstance and extent of which shall be subject to approval or direction of Landscape Architect and/or Construction Manager based on the following:
- 1) One (1) gallon bag sample for quality control confirmation testing of import fill materials shall be taken at random from haul trucks for, as a minimum, each 100 (One hundred) cubic yards of material delivered to site for placement and compaction. Sample shall be identified with copy of truck delivery slips containing pertinent information of source and type as approved.
 - 2) Samples taken shall be laboratory tested and reports made as specified for soil analysis of respective material in Part 2 herein to confirm compliance with or note discrepancy from previously approved material testing and Soil Certifications and Analysis of materials at source.
- e. Materials in question shall not be used, pending test results of conformance to specified requirements.
2. On-site Quality Control Testing and Inspections: Owner will engage and pay for the services of a qualified Testing Laboratory / Inspection Agency to perform on-site observations, testing, and inspections. Sub-grade preparation, soil placement, and other earthwork will be subject to quality control inspections and testing by Owner's Testing Laboratory / Agency as specified or, if any questionable conditions, additionally as directed by the Landscape Architect and/or Construction Manager.
- a. Tests of on-site fill placements and compacted materials will be required to be made on a regular basis as additionally specified in Part 3 Article "Field Quality Control", herein.
 - b. Contractor shall cooperate in obtaining samples and performing tests of in-place materials and shall furnish incidental field labor in connection with any tests to be performed by Owner's Testing Laboratory / Agency.
3. Construction Monitoring:
- a. During construction operations, in addition to Owner's Testing Laboratory / Agency, Landscape Architect or Construction Manager may be present at the site to observe and monitor earthwork operations and shall be permitted free and unrestricted access to the site and work.
 - b. Landscape Architect or Construction Manager may, at their discretion, take additional tests or order additional tests made by either Contractor's or Owner's Testing Laboratory/Agency respective to conditions.
 - c. Based on observations and evaluation of quality control tests, the Contractor's or Owner's Testing Laboratory/Agency shall make recommendations to Landscape Architect and Construction Manager regarding conformance of the earthwork to Contract Documents and compatibility of actual subsurface conditions at design grades to required subsurface conditions and sub-grade conditions in preparation for other specified work.
 - d. The Landscape Architect will evaluate the recommendations of the respective Testing Laboratory/Agency and, together with the Construction Manager and Owner, will judge the compliance of the work with Contract Documents, issue any changes or revisions required to Contract Documents to accommodate subsurface or sub-grade conditions which differ from design assumptions, or advise Construction Manager to direct remedial work where the completed work does not comply with Contract Documents.

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1. American Society for Testing and Materials (ASTM):
 - a. C29: “Standard Test Method for Bulk Density (Unit Weight) and Voids in Aggregate”.
 - b. C33: “Standard Specification for Concrete Aggregates”.
 - c. C136: “Standard Test Method For Sieve Analysis of Fine and Course Aggregates” (Dry Sieving).
 - d. D422: “Standard Test Method For Particle-Size Analysis of Soils” (Hydrometer).
 - e. D698: “Standard Test Methods For Laboratory Compaction Characteristics of Soil Using Standard Effort” (Standard Proctor).
 - f. D1556: “Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method”.
 - g. D1557: “Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort”.
 - h. D2167: “Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method”.
 - i. D2922: “Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods” (Shallow Depth).
 - j. D6817: “Standard Specification for Rigid Cellular Polystyrene Geofoam”.
2. New York State Department of Environmental Conservation, Division of Solid and Hazardous Materials:
 - a. Recycling of Organic Waste Through Composting, Land Application, and Other Means; 6 NYCRR Subparts 360-1 through 360-5.

C. Qualifications For Fill Soil Installations:

1. Work of fill soil installation shall be performed with personnel familiar and experienced with horticultural related fill soil preparation and related requirements associated horticultural installations under the supervision of a foreman experienced in landscape work.
2. Foreman on the job shall be able to exhibit at least 5 years’ experience in the installation of horticultural soils and soil mixes.

D. Qualifications For EPS Fill Installations: Installer for light-weight geofoam fill system, with experienced personnel, shall be qualified to perform EPS fill installations and shall be able to exhibit specialized installations in work similar to that indicated for this Project over a period of the past 5 years.**E. Pre-Installation Conferences:** Pre-installation conferences shall be held prior to commencement of earthwork or other field operations and prior to installation of any fill soils. The purpose of both conferences shall be to review submitted Work and Protection Plans And Related Scheduling and to establish any other procedures for maintaining optimum working conditions, to afford protection of horticultural conditions of Project, and to coordinate this Work with related and adjacent work.**F. Field Samples/Mock-ups:** Construct at earliest possible time before proceeding with respective work using same materials and equipment as will be used on Project Work.

1. Fill and Compaction Sample(s): For placement condition of fills drainage layer proposed in planting areas, identify an area on-site, approved by the Construction Manager, to verify and establish understanding of fill placement and compaction methods for the soil conditions and density specified.
2. Each area shall be of size to suit method for typical fill soil conditions specified with a minimum finished surface of 200 square feet.

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- a. Excavate to sub-grade level and proof roll (except for mock-ups on Pier deck).
 - b. Prepare sub-grade and place each soil layer respective to Mock-up.
 - c. Allow for Owner’s quality control testing of each soil layer as placed and at completion.
3. Provide the following Mock-up areas:
- a. Full depth (from Pier deck) lawn area profile on Pier with representative Planting Soil. Include Drainage Mat and aggregate/EPS fills as applicable.
 - b. Full depth (from Pier deck) tree pit and planting bed area profiles on Pier with representative Planting Soil. Include Drainage Mat, drainage, and EPS fills as applicable.
 - c. Full depth (from Pier deck) dune planting profiles on Pier with representative Planting Soil. Include Drainage Mat, drainage, and EPS fills as applicable.
 - d. Full depth (from Marine Deck) high marsh planting profiles on Marine Deck with representative Planting Soil. Include Drainage Mat, drainage, and EPS fills as applicable.
 - e. Full depth (from Pier deck) tree planting at wood deck planting profiles on Pier with representative Planting Soil. Include Drainage Mat, drainage, and EPS fills as applicable. Wood deck and associated framing and slab may be excluded.
4. Method of fill placement and compaction, when approved, will establish a basis for standard of acceptance for this portion of earthwork.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements for Packaged Materials, Soil Materials Deliveries, and Soil Storage / Stockpiling as specified in Division 2 Section 02910 “Soil Preparation and Mixes” and the following.
1. Prevent compaction of fill soils and soil mixes in stockpile.
 2. Maintain separation of different fill soil and soil mix types.
 3. Maintain separation of contaminated and unsuitable materials during handling and temporary stockpiling well clear of materials to be used for Project work. Remove these materials or items promptly.
 4. Protect stockpiles from erosion as specified.
- B. Handling and Storage of Soil Material Removed as Part of Excavation Work: As specified in Article “Excavation, General”.
- C. EPS Materials: Deliver EPS in manufacture’s original packaging with identification marks intact.
1. Store and protect from damage.
 2. Comply with additional provisions in Part 3 Article “Fill and Backfill”.

1.7 PROJECT / SITE CONDITIONS

- A. Acquaintance with Existing Site Conditions:
1. Through study of all Contract Documents, and by careful examination of the site, become informed as to the nature and location of the Work, the nature of subsurface soil conditions, the location of the groundwater table and groundwater conditions, the character, quality and quantity of materials to be encountered in excavations, the character of equipment and facilities needed preliminary to and during the prosecution of the Work, the general and local conditions, and all other matters which can in anyway affect the Work.
 2. Refer to Information Available to Bidders for information drawing(s) and reports relating to previous “as built” conditions and concurrent construction.
 3. Investigate the conditions of public thoroughfares and roads as to availability, clearances, loads, limits, restrictions, and other limitations affecting transportation to, ingress and egress of this work

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site. Conform to all governmental regulations in regard to the transportation of materials to, from and at the job site, and secure in advance such permits as may be necessary.

4. Surface and Subsurface Conditions: Review available information and make an independent interpretation of the surface and subsurface conditions that may affect work. Be responsible for any damage or injury that may result from working on or near utilities, substructures, and around existing surface finishes.

B. Existing Conditions:

1. Refer to and comply with provisions as specified in paragraph(s) with similar title in Division 1 Section 01700 “Execution Requirements” and other Sections of Division 1 for the following:
 - a. Acquaintance With Existing Site Conditions.
 - b. Surface and Subsurface Conditions.
 - c. Access to and Use of Site.
 - d. Existing Utilities and Services.
2. Significant portions of Earthwork operations will occur over existing waterfront structures (piers/platforms) and in close proximity to or over existing waterfront bulkhead and Bikeway wall structures. Take all necessary precautions in providing equipment for, in performing Earthwork operations over/near, and to maintain the structural and design integrity of these conditions.
3. Should the Contractor, in the course of Work, find any discrepancies between Contract Drawings and physical conditions or any omissions or errors in the Contract Documents, or in layout as furnished by the Owner, it will be Contractor's duty to inform the Construction Manager immediately in writing for clarification. Work done after such discovery, unless authorized by the Construction Manager, shall be done at the Contractor's risk.

C. Environmental Requirements:

1. Perform site mixing and on-site soil work only during suitable weather conditions. Do not disc, rototill, or work soil when frozen, excessively wet, or in otherwise unsatisfactory condition.
2. Soil mixes shall not be handled, hauled, or placed during rain or wet weather or when wet near or above field capacity.

D. Materials Ownership and Historic Items: As specified in Division 2 Section 02232 “Site Preparation, Demolition, and Removals”.

1.8 SEQUENCING AND SCHEDULING

- A. Adjust, relate together, and otherwise coordinate work of this Section with work of the Project and all other documents and Sections of the Project Manual.
- B. To greatest extent possible, completely install underground utilities, services, foundations and other construction elements for Project systems prior to placement of horticultural planting soils.

1.9 REGULATORY REQUIREMENTS

- A. Comply with all rules, regulations, laws and ordinances of local, state and federal authorities having jurisdiction. Provide labor, materials, equipment, and services necessary to make Work comply with such requirements without additional cost to Owner.
- B. Procure and pay for permits and licenses required for work of this Contract and Section. Process in sufficient time so as not to delay start of scheduled Contract work.

HUDSON RIVER PARK – SEGMENT 3**PIER 26 UPLAND PARK CONSTRUCTION****PART 2 - PRODUCTS****2.1 FILL AND BEDDING MATERIALS**

- A. Fill Soils and Mixes: The following materials shall be furnished as specified with related material testing in Division 2 Section 02910 “Soil Preparation and Soil Mixes” and shall be installed and used together and in coordination with materials and requirements of this Section:
1. Coarse Sand for Drainage Layer.
 2. Planting Soil Mix ‘A’
 3. Planting Soil Mix ‘B’
 4. Planting Soil Mix ‘C’
 5. Planting Soil Mix ‘D’
- B. Existing On-site Soil As Fill Material:
1. Existing site soil obtained from excavation operations on-site may not be used for filling and backfilling.
- C. Imported (Borrow) Material, General Requirements:
1. All materials obtained from off-site sources shall be new materials mined exclusively for use in this Contract Work.
 2. Recycled Material: If any recycled material is utilized as soil material or soil components proposed for Project in lieu of naturally deposited off-site material, Contractor shall perform additional material testing to demonstrate that the recycled material does not exceed heavy metal content as specified and that the material otherwise complies with the criteria specified herein. Testing and related test reports submitted for approval shall be at Contractor’s sole expense and shall not cause delay in the work.
- D. Coarse Sand Material for Drainage over EPS: Provide Coarse Sand material as specified for installation at Drainage Layer:
1. Coarse Sand for mixing with other planting soil components to meet Specification requirements shall be a naturally occurring, manufactured, uniformly graded coarse sand consisting of clean, inert, rounded grains of quartz or other durable rock and free from loam or clay, surface coatings, mica, other deleterious materials. Coarse Sand material shall comply with the following gradation for material passing a Number 10 Sieve for washed sieving:

U.S. Sieve Size No.	% Passing Minimum	% Passing Maximum
10	100	-
18	50	80
35	20	45
60	8	20
140	0	8
270	0	3
0.002mm	0	0.3

- a. Maximum size shall be one-inch (1”) largest dimension. The maximum retained on the #10 sieve shall be 20% by weight of the total sample.
- b. The ratio of the particle size for 70% passing (D70) to the particle size for 20% passing (D20) shall be 3.0 or less ($D70/D20 < \text{or} = 3.0$).

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- c. Tests shall be by combined hydrometer and wet sieving in compliance with ASTM D422. Test results shall be submitted for both percent (%) retained and percent (%) passing for all sieve sizes.

E. Washed Gravel (Marine Deck): Where Washed Gravel is indicated; use materials as specified herein.

1. Washed Gravel shall consist of washed, clean, hard, durable crushed rock consisting of angular fragments obtained by breaking and crushing solid or shattered natural rock free from loam, clay, or mica. Material shall be free (one percent maximum) from a detrimental quantity of flat, elongated (where average width exceeds 4 times the average thickness) pieces, or other objectionable pieces. Material shall also be free of recycled materials such as concrete, masonry, glass, ceramics, etc.
2. Washed Gravel shall have the following gradation as determined by ASTM Designation C33, No. 8 Gradation:

<u>Passing Sieve</u>	<u>Percent Passing by Weight</u>
1 inch	95-100
3/4 inch	85-100
1/2 inch	25 to 60
3/8 inch	5 to 20
No. 4	0 to 10
No. 8	0 to 5

3. Provide processed Washed Gravel material obtained from off-site sources.

F. ESCS Aggregate: Lightweight aggregate shall be Expanded Shale, Clay, or Slate (ESCS) produced by the rotary kiln process and meeting the requirements of ASTM C330. No by-product slags, coal derived by-product aggregates (cinders, bottom ash, fly ash) or pumice, scoria, tuff shall be permitted. Light weight aggregate shall have a proven record of durability, shall be non-corrosive, and shall comply with the following criteria and properties:

1. Expanded Shale, Clay and Slate Mix material shall comply with the following gradation as determined by combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition:

U.S. Sieve	% Passing	% Passing
<u>Size No</u>	<u>Minimum</u>	<u>Maximum</u>
3/4 inch	100	-
1/2 inch	90	100
3/8 inch	40	80
4	0	20
8	0	10
200	0	10

Test results shall be submitted for both percent (%) retained and percent (%) passing for all sieve sizes.

2. ESCS Aggregate shall conform to the following characteristics:
 - a. Nominal Bulk Density (Loose) of ESCS Aggregate shall be 35 to 40 pounds per cubic foot.
 - b. The light weight aggregate producer shall submit verification of a compacted moist density of less than 55 lb/ft³ when measured by a one point proctor test conducted in accordance with a modified version of ASTM D698 "Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort".

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- c. Soundness Loss: The maximum soundness loss shall be 3% when tested using the Magnesium Sulfate method in accordance with ASTM C88.
 - d. Abrasion Resistance: The maximum abrasion loss shall be 30% when tested in accordance with ASTM C131.
 - e. The minimum permeability shall be 2.5cm/sec when tested in accordance with ASTM D2434.
 - f. pH shall be between 6.5 and 8.0.
 - g. Chloride Content: The maximum chloride content shall be 100 ppm when tested in accordance with AASHTO T 291.
3. ESCS Aggregate Sources:
- a. Carolina Stalite Company, PO Box 1037, Salisbury, NC 28145-1037.
 - b. Norlite Corporation, 628 S. Saratoga Street, Cohoes, NY 12047.
 - c. Northeast Solite Corporation, 1133 Kings Hwy, Saugerties, NY 12477.
 - d. Solite, LLC, 3900 Shannon St., Chesapeake, VA 23324.
 - e. Or approved equal.
- G. Foamed Glass Aggregate
- 1. Provide Ultra-Lightweight Foamed Glass Aggregate by Aero Aggregates, or approved equal
 - 2. Foamed glass aggregate shall be made from a minimum of 98% recycled glass
 - 3. Foamed glass aggregate shall meet the following gradation specifications:
- | Sieve Size | Total Percent Passing |
|---------------|-----------------------|
| 4" (100mm) | 100 |
| 2 1/2" (63mm) | 85-100 |
| 3/8" (9.5mm) | 0-15 |
- 4. The as-delivered foamed glass aggregate shall have a maximum dry density of no more than 15 pcf as determined by ASTM C-29
 - 5. The foamed glass aggregate shall be made using a dry foaming process to produce a closed cell structure and shall be non-leaching
 - 6. The in-place compacted dry density shall not exceed 20 lbs/cubic foot when determined in accordance with the method specified by the Owner or Owner's Representative
- H. Bedding Material: Generally, bedding material for utilities and the like installations shall be the same as Lightweight Aggregate material as specified herein except for the following conditions:
- 1. For installation of Subdrainage System (Under Drainage) as porous pipe filter: Use Sand and Gravel Mix material as specified elsewhere in this Section.
 - 2. Where Sand is indicated for specific condition of use as bedding, provide Sand material as specified:
 - a. Sand for Bedding: Sand shall consist of natural mineral soils or processed mineral materials free of combustible, organic and frozen materials, roots, topsoil, loam, trash, snow, ice, wood and other objectionable materials that may be compressible or cannot be compacted as specified. Gradation of sand to be used for indicated bedding condition shall conform to ASTM C33 for Fine Aggregate.
 - b. Sand (for bedding) shall be supplied from off-site sources.
- I. EPS Geofilm Fill System: Provide EPS fill material as manufactured and supplied by R-Control Building Systems, Suite 201, 24000 W. Highway 7, Excelsior, MN 55331 (tele; 800/255-0176); or approved equal.
- 1. EPS Geofilm Materials:
 - a. Geofilm block and/or planar fill materials shall be produced by a plant facility licensed by the approved manufacturer.

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- b. Expanded polystyrene foam blocks and/or planar (EPS) shall be of density and composition conforming to ASTM D6817 Type EPS19 with respect to Pier areas as indicated. EPS geofoam material shall be manufactured with tested and proven fire retardant and termite/insect resistance treatment additives. Treatment agents shall be EPA registered materials for use with foam plastic.
- 1) Material Properties for Type EPS19 (ASTM Testing Standard):
- | | |
|---------------------------|--|
| Density: | 1.15 lbs/cuft minimum (C303). |
| Compressive Resistance: | 13.0 5.8 psi minimum (D1621) at 1% deformation. |
| Flexural Strength: | 30.0 psi minimum (C203). |
| Water Vapor Permeability: | 3.0 perm-in maximum (C272). |
| Water Absorption: | 3.0 % by volume maximum (C272). |
| Boring Insect Resistance: | (D3345). |
- c. Provide in block or other size for use as a lightweight fill material over existing Pier structure areas shown and to suit layered design and fabrication details as required.
- d. Geofoam block and/or planar fill materials delivered to this Project shall be labeled with manufacturer's name and product type.
2. Fabrication: Shop and/or field fabricate EPS Geofoam fill materials to comply with the following as a minimum:
- a. Cored holes and channels for the purpose of drainage and for accommodating utility systems, and footings.
- b. Contoured (tapered) bottom surfaces to fit existing (surveyed) Pier deck structure and contoured (tapered) top surfaces to conform with sub-grades for overlying finish materials as indicated on Contract Drawings.
3. Accessory Lateral Restraints (Binder Plates): Provide galvanized, barbed, metal fasteners of type (GeoGripper Plate) available from the geofoam manufacturer. Furnish two-sided barbed fasteners for use between layers and single sided barbed fasteners on the exposed portions of each layer and on top of the final layer. Provide a minimum two (2) plates for each section of EPS block and additional plates as recommended by geofoam manufacturer to suit conditions on this Project.
4. Nylon Strap and Anchoring:
- a. For Straps: provide 3" W X 50' polyester web, winch straps with wire hooks and a working load limit of 5,400 lbs.; USCC Cargo Control Part #350WH as manufactured by US Cargo Control 202 Blue Creek Drive, Urbana, IA 52345, PH: 866-444-9990 or 319-443-3106; or approved equal.
- b. For Anchoring Provide 4" round. 1/2" galvanizes steel plates with 5/8" anchor bolts at 1-2" lengths as manufactured by Hilti or approved equal.

2.2 ACCESSORY MATERIALS

- A. Soil Separation Geotextile (Filter) Fabric: Provide non-woven type, 4 oz. weight, shall be Mirafi 140N, or approved equal.
1. Soil Separation (Filter) Fabric for use with utility installations, excluding Under Drainage (Subdrainage) System, and for soil protection after completed installation and before planting work.
- B. Geotextile for use with foamed glass aggregate: s.
1. The geotextile construction shall be a non-woven, staple fiber, needle-punched, polypropylene geotextile
2. The geotextile shall have a minimum mass per unit area of 6 oz/square yard per ASTM D5261

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3. The minimum grab tensile strength (MARV) of the geotextile shall be 160 lbs (712N) per ASTM D4632.
- C. Drainage Mat: Provide composite drainage system consisting of a three-dimensional, crush-proof, dimpled drainage core and bonded woven monofilament polypropylene filter fabric; Delta-Drain 9000, as manufactured by Cosella-Dorcken Products, Inc., 4655 Delta Way, Beamsville, Ontario LOR 1B4; or approved equal.
1. Drainage mat is available in roll form with filter fabric extending on one side 4 inches beyond core. Comply with following physical properties:
 - a. Core:
 - 1) Thickness, ASTM D1777: 0.40 inch (10mm).
 - 2) Compressive Strength, ASTM D6364: 18,000 psf.
 - 3) Geocomposite Flow Rates, ASTM D4716: 27 gpm/foot width (72 inches) at hydraulic gradient 1.0 and 5.4 gpm/foot width at hydraulic gradient 0.10.
 - b. Fabric:
 - 1) Flow Rate, ASTM D4491: 145 gpm/sq.ft.
 - 2) U.V. Resistance, ASTM D4355: 90% @ 500 hours.
 - 3) Apparent Opening size, ASTM D4751: 40 Sieve (0.42mm)
 - 4) Grab Tensile, ASTM D4362: 365 lbs.
 2. For use as continuous placement over existing waterfront structure (Pier deck) topping slab over which any Light Weight Aggregate Mix, EPS fill, and/or Aggregate base courses are to be placed and at walls (vertical) or other conditions as indicated.
- D. PVC Pipe: Conform to ASTM D1785, Schedule 40.
- E. Erosion Control Materials (For Temporary Use):
1. Erosion Control Netting: Provide Soil Separator (Filter Fabric) as specified.
 2. Straw bales, wire bound, clean, and free of weed seeds.
 3. Stakes and Posts: For miscellaneous conditions, pressure treated dressed lumber. Posts shall be minimum 2" x 4" nominal by length required for secure installation.
 4. Fencing: Utilize temporary soil protection fencing to suit conditions.
 5. Other, as approved by the Landscape Architect or Construction Manager to suit conditions of use.
- F. Warning Tape, Detectable Type: Acid and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, minimum 6 inches wide and 4 mils thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
1. Red: Electric.
 2. Yellow: Gas and/or other dangerous materials.
 3. Orange: Telephone, data, site security and other communications.
 4. Blue: Water supply systems.
 5. Green: Site storm and sanitary systems.
- G. Soil Protection Fencing System (For Temporary Use):
1. Fence Fabric: High density polyethylene 1" diamond mesh fencing conforming to the following requirements:

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- a. Tensile yield: Average 2000 lbs. per four foot width (ASTM D638).
 - b. Ultimate tensile strength: Average 2,900 lbs. per four-foot width (ASTM D638).
 - c. Elongation break (%): Greater than 1,000% (ASTM D638).
 - d. Color: Safety Orange.
2. Soil Protection Fence Posts: Size 1" by 1", 13 gauge, "U" steel channel provided with plastic safety caps on top ends to prevent injury.
 3. Soil Protection Fence Fasteners (Ties): Fence fasteners (Ties) shall be light weight plastic, adjustable, self-locking type of minimum 6 inch length with minimum 100 lb. breaking strength. Fastener color shall be black.
- H. Herbicides:
1. Herbicides to control undesirable seed germination on-site shall be approved by Landscape Architect before use, including confirmation of location, type and rate of application, and applicator. In addition, conditions of use and material type shall be in conformance with local and state agencies having jurisdiction at site of work.
 2. Emergent Herbicide shall be Roundup, as manufactured by Monsanto Agricultural Products Company, C3NJ, St. Louis, MO 63166; or approved equal.

PART 3 - EXECUTION**3.1 GENERAL EXECUTION REQUIREMENTS**

- A. Contractor shall furnish all labor, equipment, and materials required for earthwork; for obtaining, preparing, testing, amending, and placing of soil materials and fill soil mix types, and for performing related work. Accept actual conditions existing at site. Utilize appropriate equipment, in sufficient quantity and sizes, to perform work.
1. To control compaction and to avoid over compaction in planting areas, excavation and placement and grading of soil mixes shall be conducted with a small tractor with broad rubber tires (generally less than 10 psi load distribution), track type dozer (3 psi or less load distribution), or other similar vehicle.
 2. At Pier areas with underlying EPS fill not covered by a concrete slab (ie: soil areas), use equipment and perform work under conditions that will not deform, crush, or break the EPS fill.
 3. Equipment used is subject to approval of Landscape Architect . On-site blending of soil mixes and amendments shall only be performed by hand operated walk-behind type equipment. No trucks or other mechanized equipment shall be allowed in areas where horticultural soil mixes have been placed without prior approval of Landscape Architect or Construction Manager and then subject to replacing of the soil areas disturbed.
- B. Verification of Conditions:
1. Prior to construction and soil placement operations at planting areas, ascertain the location of all existing electric cables, conduits, piping, irrigation, under-drainage systems and utility lines.
 - a. Take proper precautions so as not to disturb or damage subsurface elements. Contractors failing to take these precautions shall be responsible for making requisite repairs to damaged utilities at Contract's own expense.
 - b. If subsurface elements are uncovered at a specific location for a utility, irrigation, or other system item, notify the Landscape Architect immediately for approved relocation of item(s).
 2. Verify that all work requiring access through or adjacent to areas where horticultural soil mixes are to be placed has been completed and no further access (other than exterior planting installation) will

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be required. In the event that access will be required, access must be approved by the Landscape Architect or Construction Manager and will be subject to replacing of the soil areas disturbed.

- C. Relate and adjust earthwork together with irrigation system installer for completion of irrigation system in relation to planting requirements.

3.2 PREPARATION**A. Layout and Field Survey Work:**

1. Use established benchmarks and surveyed control base lines of Project site survey for control of lines and elevations. Refer to and comply with Division 1 Section 01700 “Execution Requirements” for qualifications and additional Project related survey requirements.
2. Staking Out of Work:
 - a. Locate excavation and grading limit lines, backfill material of different types, site improvements, paving area layouts, and planting area layouts, and their proposed elevations. Locations, including pier areas, shall be referenced to bench marked control base lines indicated in the Contract Documents and to Project limit lines of survey prepared for Project.
 - b. At areas of fill/backfill and grading, in order to maintain correct elevations and slopes, provide as a minimum a network of 25-foot spaced reference stakes installed around the perimeter to be filled including every corner, high point, low point, grade break, and like points of control. Control stakes, on a 25-foot grid and additionally as required, shall be placed in the interior fill zones to monitor thickness and tolerances of the filled and graded areas.
 - c. Contractor shall advise the Construction Manager when the staking out of Work is completed. Re-stake as work progresses to include necessary and Landscape Architect or Construction Manager approved corrections for implementation and, as otherwise determined, install secondary reference points for and related to subsequent planting layouts.
3. Topographic and Location Surveys: As specified in Article “Field Quality Control” herein.

B. Protection, General: Protective measures shall include temporary construction in addition to protection provisions specified in Division 1 Section 01500 “Temporary Facilities and Controls”. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

1. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during work operations that may cause damage.
 - a. Protect adjacent existing bulkheads and pier structures from damage.
 - b. Protect existing and/or temporary drainage systems from intrusion of debris and clogging.
 - c. Protect adjacent surfaces and finishes including existing fences.
 - d. Protect other existing structures, Route 9A Bikeway wall, copings and edgings adjacent to work areas as well as, any equipment, piping, conduits, etc. in the work area and adjoining areas, and leave the same in a safe and satisfactory condition as approved by the Landscape Architect.
2. Contractor shall take actions and provide temporary installations necessary, subject to concurrence of Construction Manager, to allow the progress of the Work to continue and to make the work accessible to construction equipment and working persons.
3. Use water, mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding and pollution.

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4. Take precautions to guard against movement, settlement, or collapse of any adjacent conditions, sidewalks or street passages, adjoining property, and adjacent structures. Be liable for any such movement, settlement, or collapse. If such damage does accidentally occur, safeguard the public and repair promptly.
 5. Dust and Debris Control:
 - a. The Contractor is responsible for any and all dust, debris, sedimentation and any other controls required by the work permits granted by the regulatory agencies having jurisdiction. Contractor shall submit proposed spill, dust, debris and sedimentation control methods and procedures to Landscape Architect for review and acceptance prior to use.
 - b. The discarding of any material into the waterway is prohibited. Provide adequate protection to carefully preclude any possibility of materials being dropped from a pier or bulkhead into the water.
 6. Noise Control: Comply with governing regulations pertaining to noise levels during operations.
- C. Temporary Erosion Control Measures:
1. Provide and maintain all temporary control measures as required, as necessary for protection of on-site or adjacent site conditions, or as directed by the Construction Manager for duration of Contract to control soil erosion, sediment, and dust as may be related to respective Contract Work.
 2. Temporary erosion control measures shall be used to correct conditions which develop during construction or that are temporarily needed to control erosion that develops during normal construction practices. Work shall include, but not be limited to, the installation and maintenance of berms, ditches, fiber mats, straw, netting, silt traps and fences, mulches, straw bales, grasses, and other approved erosion control devices or methods.
 3. Conduct operations to minimize erosion of soils and to prevent silting and muddying adjacent Hudson River and lands adjacent to or affected by the Work. Construction of drainage facilities and performance of the Contract Work that will contribute to the control of erosion and sedimentation shall be carried out in conjunction with the earthwork operations. Existing or previously installed drainage facilities shall be filtered, screened, and maintained to prevent debris or soil infiltration or sedimentation into the drainage system(s).
 4. Comply with requirements of the permits issued for the Project and applicable Federal, State, and City statutes and ordinances related to the prevention and abatement of soil erosion, sediment, and dust.
 5. Silt Fence and Straw Bale Check Dams:
 - a. Install at all locations where water flows from construction areas including at drainage structure inlets and entire perimeter of construction areas where ground slopes outward. Maintain around drainage structures until starting of final sub-grade preparation.
 - b. Arrange to create ponding behind barriers, remove accumulated sediments periodically and maintain ponding capacity during construction.
 - c. Sediments shall be removed from flowing water by filtration. Primary filter media may consist of silt trenches utilizing anchored sediment drainage fabric, straw bales, and/or with crushed stone and staked or otherwise held securely in place.
 - d. Temporary soil stockpiles shall be protected by silt fencing surrounding stockpile in any areas that will not exhibit hazardous conditions on site.
- D. Dewatering:
1. Prevent surface water and ground water from entering excavations, from ponding on prepared sub-grades, planting soil surfaces, and from flooding Project site and surrounding area.
 2. Protect sub-grades and soil fill areas from softening, undermining, washout, and damage by rain or water accumulation. Protect compacted soil areas so that compaction densities and bearing capacities are not altered.

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- a. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
 - b. If necessary for protection or as directed by Construction Manager, install a dewatering system to keep sub-grades dry and to convey ground water out of and away from excavations.
 - c. Maintain dewatering and/or other protections until completion of excavations and protection from water accumulations are no longer required.
3. Reference Division 1 Section 01500 “Temporary Facilities and Controls” for additional dewatering provisions.
- E. Temporary Soil Protection Fencing: Install and maintain as specified in Part 3 Article “Maintenance and Protection” herein.

3.3 EXCAVATION, GENERAL**A. General Requirements:**

1. Excavation work includes the unclassified excavation of pavement systems, obstructions, and other items visible on surface and underground not otherwise previously cleared or removed as work of another Contract Section.
 - a. See Division 2 Section 02232 “Site Preparation, Demolition, and Removals” for additional provisions related to removal of existing underground elements and/or obstructions.
 - b. The use of explosives is prohibited.
2. Carry all excavations for structural elements (footings, foundations, piers, utility structures, etc.) as a minimum to sub-grade level(s) indicated. Allow for depths of indicated base course(s) and transitions to adjacent conditions.
3. Carry all excavations for areas of planting beds, and paving with tree pits to allow for indicated horticultural planting soil mix layers.
4. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing utility services and other construction, and for inspections.
 - a. Do not disturb bottom of excavation intended for bearing surface. Excavate by hand to final grade just before placing concrete foundation/footing reinforcement. Trim bottoms by hand to required lines and grades to leave solid/firm base with bearing capacity to receive other work.
 - b. At areas of previously placed with in-place planting soils or where machine excavation could damage conditions to remain, perform excavation by hand (without machines).
5. Storage of Soil Material From Excavation Work:
 - a. Stockpile soil materials away from edge of bulkhead and excavations; without intermixing different soils; with stockpiles placed, graded, and shaped to drain surface water; and as specified in Part 1 Article “Delivery, Storage, and Handling” herein.
 - b. Separate contaminated and unsuitable material upon excavation of same. Place and cover contaminated and questionable contaminated material on and with non-porous plastic sheets.
 - c. Comply with temporary erosion controls.
 - d. Remove unsuitable material and excess excavated material as specified.
6. Open excavations shall be secured and made safe daily.

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- B. **Unclassified Excavation:** Excavation to sub-grade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and sub surface obstructions.
1. Unclassified excavation consists of removal and subsequent disposal of unsuitable materials encountered when establishing indicated or required sub-grade elevations. Maintain separation and identification of unsuitable materials from materials approved as suitable for use.
 2. Excavate unclassified materials utilizing appropriate equipment, in sufficient quantity and sizes, to perform the excavation.
 3. If excavated materials intended for fill/backfill material or sub-grade surface includes unsatisfactory soil materials, sub surface obstructions and/or debris, or rock, replace with soil materials classified as suitable and approved by Landscape Architect.
- C. **Unauthorized Excavation:**
1. Unauthorized excavation consists of removal of material beyond indicated design sub-grade elevations or dimensions without specific direction.
 2. Unauthorized excavation, as well as remedial work directed by the Landscape Architect or Construction Manager shall be at Contractor's expense.
 - a. Fill unauthorized excavation under foundations or footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by the Construction Manager.
 - b. Fill unauthorized excavations under other construction or utility pipe / conduit as directed by Landscape Architect or Construction Manager.
- D. **Additional Excavation Work:** Additional excavation and, if required, resultant replacement of structural soils or horticultural planting soil fill material will be paid for according to Contract provisions for changes in the Work.
- E. **Approval of Sub-Grades:** Extent of each sub-grade area, as a portion of Project work, shall be prearranged with and approved by Construction Manager.
1. Notify Construction Manager when excavations have reached required sub-grade and allow time for observation and review of completed sub-grade conditions together with Contractor's arranged Verification of Elevation survey.
 2. Comply with requirements specified for "Preparation of Sub-Grades" in Article "Item Excavations" and Article "Field Quality Control" herein.
 3. If Construction Manager and/or Landscape Architect determine that unsatisfactory soil is present, continue excavation and replace with compacted suitable fill/backfill material as directed by Landscape Architect .
 4. Reconstruct sub-grades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Landscape Architect .
 5. Be prepared to continue earthwork operations, installation of utilities, and fill/backfill placements upon Landscape Architect's acceptance of sub-grade so that possible damage to sub-grade is minimized.

3.4 PREPARATION OF SUB-GRADES

- A. **Preparation of Sub-grades:**
1. Confirm completion of excavation and grading to required elevations.
 2. Perform proof rolling of graded sub-grade surface in presence of Owner's Inspection Agency. Make corrections to surface conditions as necessary including removal of unsuitable soil or other material (organic, soft clay, etc) at sub-grade to at least 6 inches depth, backfilling resultant areas of removal with acceptable material, and re-grading.

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3. Obtain Landscape Architects approval of sub-grade before proceeding with fill/backfilling operations.

B. For Structures:

1. Relate to and adjust excavation together with work required for specific type of construction, material to be used (cast-in place concrete, precast concrete, masonry, etc.), and item requirements. See respective documents and specification Sections in Project Manual as applicable.
2. For Under Drainage (Subdrainage) Systems: A system network of subsurface drainage lines shall be installed as specified in Division 2 Section 0260 “Planting Drainage Sytems” prior to the installation of the Drainage Layer Course Sand soil material or other planting soils. Comply with typical trench excavation requirements specified herein.

C. For Lawn and Planting Areas:

1. Prepare site areas for lawns, planting beds and areas under paving with tree pits to depths required for placement of Fill and Planting Soil systems as specified. Provide sub-grade level with required slope for subdrainage piping and to suit other related work.
2. Shape (profile) sub-grade to suit tree pit depths and tree pit diameter sizes in planting bed areas with allowance for Drainage Layer and subsequent planting soil fills.

3.5 FILL AND BACKFILL

A. General Installation Requirements:

1. Use only fill material that has been approved and/or determined to be suitable as approved by Landscape Architect. Place in lifts for compaction, layers, and to required elevations.
 - a. Rock, concrete, masonry, or rubble materials shall not be used for general filling.
 - b. All fill/backfill, amendment, and other like materials placed on-site shall be free of heavy metals and, as a minimum, shall comply with requirements of New York State Department of Environmental Conservation, Division of Solid and Hazardous Materials; Recycling of Organic Waste Through Composting, Land Application, and Other Means; 6 NYCRR Subparts 360-1 through 360-5 to extent specified.
 - c. If a questionable material is noted, Contractor shall test to confirm content and replace if found to be unsuitable.
2. Receive borrow materials on-site and place in designated areas for stockpiling and/or for immediate placement at locations on-site to be filled/backfilled.
3. In all areas of fill, all vegetation such as roots, brush, heavy sods, growth of grass, and all decayed vegetable matter, rubbish, and unsuitable material within the area shall be removed before filling. In no case shall such objectionable material be allowed to remain in or under fill area.
4. No fill material shall be placed, spread, or compacted during freezing weather or other unfavorable weather conditions. When work is interrupted by heavy rain, fill operations shall not be resumed unless the moisture content and density of the fill are as specified.
5. The fill/backfill surface must be made smooth and free from ruts or indentations at the end of any work day, when significant precipitation is forecast, and at the completion of area compaction operations to prevent possible saturation of the fill material.

B. Prior to Backfill and Fill Placement: Perform backfilling and filling as work permits, but not until completion of the following:

1. Acceptance of other construction within or below levels of fill and backfill.
2. Construction below finish grade.
3. Surveying locations of underground utilities and related sleeves as applicable for record documents.

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4. Inspecting and testing underground utilities.
 5. Removing concrete formwork.
 6. Inspection, testing, and recording of soil conditions at design elevations and with respective approval by Landscape Architect.
 7. Removal of shoring and bracing, and backfilling of resulting voids with compacted approved materials. Remove shoring and bracing in manner to prevent settlement of the foundations, fills, utilities, or adjacent conditions.
 8. Removal of trash and debris.
 9. Removal of saturated fills and water.
- C. Concurrent with Backfill and Fill Placement: As applicable to item and to suit on-site design and installation conditions, install materials and items as specified and related to earthwork operations. Comply with installation requirements further specified in Article “Installation of Accessory Materials” herein or, if item furnished as part of other work or Section, as additionally specified in the respective Section of work.
- D. EPS Geofom Fill and Drainage Mat Installations (On Pier):
1. General: Relate to and arrange Drainage Mat and EPS Fill installations together with other work of this Project including but not limited to construction of aggregate fills, soil areas, paving systems, various utility and drainage systems, and concrete work.
 2. Drainage Mat (On Piers):
 - a. Install Drainage Mat prior to placing EPS geofom and/or other fill and according to manufacturer's written instructions and as indicated. Comply with details and locations shown. Coordinate placement with other foundation drainage materials.
 - b. At installations on Piers, cut and remove drainage framework (core) of Drainage Mat (not fabric) at all weepholes and over existing waterfront structure (Pier deck) drains to match configurations of weepholes and drains with respect to condition and as shown. Maintain continuous integrity of filter fabric portion of Drainage Mat on all surfaces.
 - c. Place Drainage Mat with core tightly butted together. Lap all edges of fabric and extend fabric as indicated or required.
 - d. Comply with manufacturer's written instructions for securing drainage mat to substrate. Use adhesives and mechanical fasteners recommended by manufacturer. Protect installed Drainage Mat during subsequent construction operations.
 3. EPS Geofom Fill:
 - a. Exercise care to prevent damage to EPS geofom fill material during delivery, storage, and construction. Damaged pieces or units of EPS geofom shall not be used. Protect EPS geofom while in storage and in-place from the following and additionally as recommended by EPS geofom manufacturer:
 - 1) Organic solvents such as acetone, benzene, and paint thinner;
 - 2) Petroleum based solvents such as gasoline and diesel fuel;
 - 3) Open flames or sources of ignition;
 - 4) Prolonged exposure to sunlight.
 - b. Preparation: Verify that the grade on which the Geofom fill will be placed is graded to the elevations indicated on the Drawings and that the finish-grade is smooth and free from holes and protruding objects.
 - c. Place geofom to the lines and grades shown in the Drawings and as directed by the Owner's Representative.

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- d. Stack blocks and/or planar EPS on top of previously installed Drainage Mat over Pier deck or, as applicable, prepared sub-grade or other indicated fill. Place EPS geofoam fill at locations and in layers as required, in accordance with approved shop drawings, and to meet indicated subgrade elevations. Place units tightly butted together and to adjacent vertical surfaces and fill all voids with sand. Provide 6” open joints between blocks with geotextile fabric over top, where noted on contract drawings.
 - 1) Stagger joints between EPS units and avoid continuous joints. To avoid continuous joints, place blocks in a bond pattern and orient each successive layer with the long axis of blocks or planar at 90 degrees to previous layer.
 - 2) Provide lateral restraint between EPS Geofoam blocks using manufacturer's barbed fasteners. Use two-sided barbed fasteners between layers and single sided barbed fasteners on exposed portions of each layer and on top of the final layer. Press fasteners firmly into EPS blocks until plate is flush with EPS surface.
 - 3) To prevent blocks from sliding during construction apply urethane adhesive between horizontal layers of blocks, as needed.
- e. Trim or cut EPS Geofoam to fit conditions and to allow access for drainage, utilities, and other penetrating conditions. Use hot-wire cutting method for trims and cuts.
- f. The surface of a layer of geofoam blocks to receive additional blocks shall be constructed with a variation in surface tolerance of no more than 0.05 feet in any 10 foot interval.
- g. The finished surface of the Geofoam to receive soil cover shall be constructed to within a tolerance of +/- three inches of the indicated grade.
- h. Wrap top and sides of Geofoam installation with geotextile filter fabric, Mirafi 140N or approved equivalent.
 - 1) Ensure filter fabric is wrapped neat, tight, and flush with Geofoam surface; leave no gaps or pockets between filter fabric and foam.
 - 2) Overlap edges of filter fabric rolls at least six inches; do not leave holes or tears in filter fabric.
- i. Provide permanent nylon strap restraint measures, approved by the Construction Manager to secure EPS geofoam fill in place until soils, pavement systems, or other indicated site improvements are placed to prevent the EPS geofoam fill from blowing away or floating away if high tides or groundwater flood the Pier deck.
 - 1) Because of the light unit-weight of the geofoam fill, it is the Contractor's responsibility to provide temporary weighting and/or guying as necessary until all the blocks are built into a homogeneous mass and soil cover is in place.
- j. Restrict heavy equipment activity and load imposing material storage from areas over EPS geofoam fill installations until pavement and other indicated site improvements are installed and complete.

E. Fill/Backfill, Soil Placement Conditions:

- 1. Fill of different material types shall be constructed at the locations and to lines and grades indicated. The completed soil fill installation shall conform to the shape of the typical sections indicated, compacted design conditions, and shall meet the requirements of the particular case.
- 2. Fill shall be placed in lifts as specified and compatible with type of material and the type of compaction equipment used. The thickness of the compacted fill layer shall not exceed the maximum allowable thickness of compaction layer specified (Article “Compaction of Fills/Backfills And Graded Areas”).
- 3. Lightweight Aggregate ESCS:
 - a. Lightweight Aggregate base course material shall be evenly spread on the prepared sub-grade in the position shown on the Contract Documents or as otherwise approved by the

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- Landscape Architect or Construction Manager. Lightweight Aggregate material shall be laid in six (6") inch lifts (maximum) and shall be compacted to the thickness shown.
- b. At Platform, Lightweight Aggregate sub-base course material shall be evenly spread on the prepared surfaces in the position shown on the Contract Documents or as otherwise approved by the Landscape Architect or Construction Manager. Lightweight Aggregate material shall be laid in six (6") inch lifts (maximum) and shall be compacted to the thickness shown.
 - c. Lightweight Aggregate under footings, concrete utility structures, concrete slabs on ground, and at other conditions indicated shall be placed to comply with requirements as may be additionally specified, with respect to constructed item, in Division 3 Section 03300 "Cast In Place Concrete". Where otherwise specified, or as indicated, Lightweight Aggregate shall be placed so that any water that may collect is effectively drained.
 - d. Place Lightweight Aggregate used at and adjacent to foundations, retaining walls, planting and other areas as shown with Soil Separator (Filter) Fabric or Geotextile Fabric between Lightweight Aggregate and underlying soils as indicated to prevent migration and intrusion of adjacent soils and clogging of drainage system.
 - 1) Extend Soil Separator (Filter) Fabric on to adjacent surfaces and/or wrap stone as indicated.
 - 2) Overlap fabric piece ends, sides, and edges at least 6 inches.
4. Aggregate base course material over sub-base course at pier shall be evenly spread on the prepared sub-base in the position shown on the Contract Documents or as otherwise approved by the Landscape Architect or Construction Manager. Aggregate material shall be laid and compacted to the thickness shown in preparation for paving systems in another Section.
 5. Foamed Glass Aggregate
 - a. Delivery, Storage, and Handling:
 - 1) Deliver, store, and handle materials in accordance with manufacturer's recommendations.
 - 2) During all stages of manufacture, shipment, storage, and construction, minimize the amount of material moves to prevent physical damage. Minimize the amount of trafficking on foamed glass aggregate until an adequate thickness of cover material is placed over the material.
 - b. Construction
 - 1) Place geotextile and foamed glass aggregate at locations indicated on the drawings.
 - 2) Construction equipment, other than for placement and compaction, shall not operate on the exposed foamed glass aggregate. The area to be filled shall not have any standing water (including ice) in it prior to placement of the foamed glass aggregate.
 - 3) Foamed glass aggregate shall be placed in lift thicknesses of 12 inches (0.3 m) [minimum] to 24 inches (0.6 m) [maximum] and compaction is performed with a tracked excavator or dozer with ground pressures of 625 - 1,025 psf (30 - 50 kPa) making 2 or more passes over the foamed glass aggregate layer. The layer should be compacted by 20% of the original lift thickness [e.g. a final height 19.2 in (0.48 m) based on a 24 inch (0.6 m) initial layer] for typical highway loading applications. For lift thickness less than 12 inches (0.3 m), compaction may be performed with tracked equipment with ground pressures of less than 625 psf (30 kPa) or with a plate compactor 110-220 lbs (50-100 kg) to achieve the 20% compaction of the layer.
 - 4) The placement of the first and second lift of foamed glass aggregate shall be utilized to establish a project-specific installation methodology that will be used to achieve 20% compaction of a given lift thickness for typical highway loading applications. The project-specific installation methodology shall reflect the lift thickness and identify the piece(s) of construction equipment and the corresponding number of passes required. Excessive compaction should be avoided to minimize crushing of the aggregate.
 - 5) For areas that will not experience typical highway loading, the compaction of the foamed glass aggregate lift may be reduced in accordance with the Project

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Documents. The table below provides final lift thicknesses for varying compaction efforts based on an original 24 inch (0.6 m) thick layer of foamed glass aggregate.

Original Lift Thickness (inch)	Compaction of Lift	Final Lift Thickness (inch)
24	10%	21.6
24	15%	20.4
24	20%	19.2

- 6) For areas around structures and utilities not accessible by tracked equipment, foamed glass aggregate shall be placed in maximum lifts of 12 inches (0.3m) and compacted with a plate compactor 110-220 lbs (50-100kg)
- 7) The geotextile will be placed as a separator between subgrade and the initial lift of foamed glass aggregate as well as above the final lift as a separator between the foamed glass aggregate and capping layer. Care should be taken during placement of capping layer to prevent damage to geotextile. Adjacent panels of geotextile may be sewn together or overlapped a minimum of 12 inches (0.3 m). The geotextile shall not be left exposed for longer than 14 days.
- 8) Planting Soil Fill: Place Planting Soil and Planting Soil Mixes of types specified and to extent indicated. Comply with Article “Planting Soil Fill Layers” herein. Do not proceed with Planting Soil installation until all utility and other excavations in same area have been completed. Maintain clear separation of soils.

3.6 UTILITY TRENCH BACKFILL

- A. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- B. Place and compact initial backfill with backfill material indicated, free of particles larger than 1 inch, on sides and to a height of 12 inches minimum over the utility pipe or conduit installation.
 1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit at height specified or shown to avoid damage or displacement of utility system.
 2. Continue with final backfill using materials to heights as indicated for each layer of cover.
 3. Compact each course or lift of trench backfill material as typically specified for fill/backfill.
- C. Coordinate sequencing and completion of trench backfilling with utility system / component testing.
- D. Fill voids with approved backfill materials while shoring and bracing, and as sheeting is removed.
- E. Warning Tape: Install warning tape directly and continuously above each utility line (including sleeves for future use as applicable), 10 inches to 12 inches below finished soil grade, except 6 inches below sub-base under proposed pavements and on-site slabs. Detectable type warning tape shall in no instance be buried more than 24 inches below finished surface.
 1. Use warning tape of correct color for utility to be marked.
 2. For conditions with multiple utilities in a single trench, use a warning tape for each utility.
- F. Place and compact final backfill to final sub-grade or grade as applicable to condition.

3.7 PLANTING SOIL FILL LAYERS

A. General:

1. Each layer of planting soils shall be completed prior to the placement of subsequent soil layers.
2. Proposed compaction equipment and methodology for placing planting soils shall be submitted to and approved the Landscape Architect prior to the start of planting soil placement operations.

B. Drainage Layer Soil (Coarse Sand) Installation over Foam Fill:

1. After complete installation of the Subdrainage System and other utilities, structures, and foundations to be placed at or below sub-grade level, place Coarse Sands Drainage Layer soil of the entire previously installed foam fill subgrade, excluding under paved areas and other areas specifically noted on the Contract Drawing details. Install to the following compacted depths as measured in-place and to suit detail conditions:
 - a. At Typical Lawn Installations: Depth as indicated by Contract Drawings, shown as minimum (sloped to drain).
 - b. At Typical Planting Bed Installations: Depth as indicated by Contract Drawings, shown as minimum (sloped to drain).
 - c. At Pier Lawn and Planting Bed Installations: Depth as indicated by Contract Drawings.
2. Shape (profile) sub-grade and Drainage Layer to suit tree pit depths and tree pit diameter sizes in both lawn and planting bed areas.
3. The Coarse Sand Drainage Layer soil shall be compacted to a minimum of 85% Modified Proctor using the tracks of a bulldozer, by vibratory roller, or by other suitable equipment approved by Landscape Architect.

3.8 COMPACTION OF FILLS / BACKFILLS AND GRADED AREAS

A. General:

1. Control soil compaction during construction for compliance with the percentage of density specified. Utilize appropriate equipment in sufficient quantity and sizes to perform compaction work.
2. Keep rollers and other heavy equipment at least 8-feet from footings, foundations, piers, and building walls and 3-feet from appurtenances and other structures on site.
3. Compact placed fill/backfill materials to required elevations evenly on all sides of structures and uniformly along the full length of each structure.
4. At horizontal transition between different zones of compacted density, care shall be taken not to over compact soils.
5. All areas and extents of compacted fill/backfill shall be confirmed at job site with Landscape Architect prior to fill/backfill and compaction operations.

B. Moisture Control for Compaction:

1. Fill/backfill material shall be treated so that the moisture content at the time of compaction is at or 2 percent above the optimum moisture content for the compacted soil.
2. Uniformly moisten or aerate sub-grade and each subsequent fill/backfill layer before compaction to within 2 percent of optimum moisture content specified as approved by Landscape Architect.
 - a. Do not place fill/backfill soil material or perform grading operations on surfaces that are muddy, frozen, or contain frost or ice.
 - b. If soil material becomes too dry for required compaction, moisten soil prior to commencing or continuing operations.

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- c. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit density.
 3. All fill soils shall be placed in a dry to damp (not wet) condition.
- C. Compaction levels with material dry density as determined by ASTM D1557 (Modified Proctor) shall be as follows:
 1. Compact each layer of fill/backfill material to the minimum percentage of the maximum dry density as specified or as otherwise indicated for specific areas and conditions. Compaction by hand-operated equipment shall be required where machine access is restricted or is otherwise not feasible.
 2. Compaction Criteria: The following fill/backfill and grading compaction criteria shall be used for full depth of backfill, including sub-grade level(s), to extent laterally indicated by Contract Documents and required by on-site conditions as approved by Landscape Architect:
 - a. Under footings, slabs on grade, utility structures, and other structural elements of on-site conditions: 95%, Modified Proctor.
 - b. Under areas of paving systems: 95%, Modified Proctor.
 - c. At planting areas: As specified in Article “Planting Soil Fill Layers” for each planting Soil installation condition. Uniform in any defined area.
 - 1) Compaction rates and any natural settlement considerations for each planting soil mix material shall be field verified prior to start of soil placement work using specified Mock-ups. Any adjustment to specified compaction rates shall be as directed or otherwise approved by Landscape Architect .
 - 2) Care shall be taken not to over compact planting area soils.
 - d. Density Tolerances: Refer to Part 3 Article “Field Quality Control” herein, for allowable density tolerances of compaction.
- D. Lift Thickness: Lifts for each soil type shall be as specified for soil placement. Compaction lift thickness shall be as follows unless otherwise indicated specific to a fill layer:
 1. At on-site areas by heavy equipment: maximum 12" thick, loose.
 2. At conditions compacted by hand-operated equipment: 6" thick, loose.
- E. Comply with specified requirements for moisture content at the time of compaction.
- F. Compaction shall be continuous over the entire area as indicated for each density value and in uniform layer depths (after compaction) at thickness specified. Equipment shall make sufficient passes to obtain uniformly the desired density.
- G. Each soil layer shall be completed with approved compaction before the overlaying lift or soil layer is placed.

3.9 GRADING

- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Uniformly smooth grades of all areas including excavated and fill sections and adjacent transition areas as sub-grade or base for subsequent work.
 1. The sub-grade shall be reasonably smooth, compacted, and free from irregular surface changes.
 2. Comply with compaction requirements specified and grade to cross sections, lines, and elevations indicated.

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- a. Provide a smooth transition between adjacent existing grades and new grades.
 - b. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
 - c. The required sub-grade elevation shall be such that when fill, sub-base, and indicated construction are added, the final elevations will be those indicated by the Contract Documents.
- B. Site Grading: Grades not otherwise indicated shall be uniform levels or slopes between such points and existing grades, except that the surface shall be rounded at abrupt changes or slopes. Grade all flat areas so as to prevent low spots and water pockets. The locations and elevations of constructions are indicated by the Contract Documents and unless inconsistencies are brought to the written attention of the Landscape Architect and/or Construction Manager prior to the commencement of work, the Contractor will be held responsible to obtain the proper and approved location(s) and elevations of the completed work.
1. All areas that cannot be compacted with a self-propelling roller shall be hand-tamped with rammers.
 2. Remove from the sub-grade and subsequent fill layer all debris, foreign materials, and all other undesirable material.
 3. Hollows and depressions that develop under rolling shall be filled with acceptable material, corresponding to layer being rolled, and shall again be rolled. This process of shaping, filling, and rolling shall be repeated until no depressions develop.
 4. Compact the sub-grade of all areas with appropriate compacting equipment or by other means to such degree as will insure against settlement of the subsequently constructed work.
- C. Rough Grading shall result in surfaces within plus or minus 0.1-foot of soil layer depths and the elevations indicated by the Contract Documents.
- D. Before any Washed Gravel or planting soils or, as specified in other Sections, paving, or other systems or materials are placed upon the sub-grade or subsequent soil fill layer, verify preparation of graded areas to design line and grade.

3.10 INSTALLATION OF ACCESSORY MATERIALS

- A. Geotextile and Soil Separation Fabrics and Planter Insulation: Place for each condition of use as shown on Contract Drawings and/or specified in this Section.
- B. Warning Tape, Detectable Type: Install Warning Tape as specified for Utility Trench Backfill installations and, if requirements more stringent, as may be additionally specified in Section with respect to utility item.
- C. Herbicides: For possible use if there is undesirable seed germination on-site after planting soil material installation. Under no circumstances are herbicide materials to be applied without specific approval and/or instruction from Landscape Architect and/or Owner.
 1. Spray all vegetation on sub-grade with an emergent weed killer at a rate of application approved by the Landscape Architect and government agencies with jurisdiction.

3.11 FIELD QUALITY CONTROL

- A. Notices: Furnish to Construction Manager and, as applicable, regulatory authority at least three working days (72 hours) notice prior to start of each or any phase of earthwork operations.
- B. Allow in schedule of operations for the Landscape Architect or Construction Manager to observe sub-grades and fill layers before further construction work or operations are performed. Placement of fill/backfill and compaction will be monitored and observed by the Owner's Testing / Inspection Agency

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and/or Construction Manager at the discretion of the Landscape Architect . Construction monitoring will be as additionally specified in Part 1 Article “Quality Assurance”.

C. Quality Control Testing During Construction:

1. Contractor Testing: Material testing to confirm that materials on-site and as delivered comply with specified requirements shall be by Contractor’s Soil Testing Laboratory/Agency as additionally specified in Part 1 Article “Quality Assurance”.
 - a. Prior to on-site soil placement, laboratory testing of soil materials shall be performed by Contractor’s Testing Laboratory/Agency and used to determine maximum density and optimum water content for each soil material type in accordance with ASTM D1557 (Modified Proctor) and as directed by the Landscape Architect or Construction Manager.
2. Owner’s Field Density Testing: Field density tests to check the degree of compaction of subgrades, fill, and backfill shall be taken by the Owner’s Testing Laboratory/Agency as specified in Part 1 Article “Quality Assurance” and additionally as follows:
 - a. Allow testing agency to inspect and test sub-grades and each fill and backfill lift and soil layer. Proceed with subsequent earthwork only after test results for previously completed work confirms compliance with requirements.
 - b. The type, location, and frequency of tests for quality control shall be as specified herein and additionally will be at the discretion of the Landscape Architect .
 - c. Owner’s Testing Agency will perform field density tests in accordance with ASTM D1556 (sand cone method), ASTM D2167 (rubber balloon method), or ASTM D2922 (nuclear method) as approved by the Landscape Architect to suit material and installation condition. Tests will be performed at the following locations and frequencies as a minimum to verify design bearing capacities:
 - 1) Footing/Foundation and Utility Structure Sub-grade Areas/Conditions: At least one (1) field density test (nuclear method) of each sub-grade soil stratum at a single footing or maximum 150 feet long footing sub-grade in a defined site area with recognized like soil condition. Subsequent verification and approval of other footing sub-grades in the same site area may be based on a visual comparison of sub-grade with previously tested sub-grade when approved by Landscape Architect .
 - 2) Trench Conditions (Below Sub-grade Level): At sub-grade and at completion of each compacted initial and final backfill layer, at least one (1) field density test for each condition and for each 150 feet or less of trench length, but no fewer than two (2) tests in any one-day operation. Subsequent verification and approval of other trench sub-grades in the same site area may be based on a visual comparison of sub-grade with previously tested sub-grade when approved by Landscape Architect .
 - 3) Paved Areas: At sub-grade and at completion of each compacted fill/backfill lift, at least one (1) test field density for every 2000 sq. ft. or less of paved area, but no fewer than three (3) tests in any one-day operation.
 - 4) Planting Bed Areas: At sub-grade and at completion of each compacted fill layer, at least one (1) field density test every one thousand (1,000) square feet or less of filled planting bed area, but no less than three (3) tests in any one-day operation.
 - d. The results of density tests of soil-in-place will be considered satisfactory if the average of any three (3) consecutive density tests which may be selected are in each instance equal to or, except planting areas, greater than the specified density, and if not more than one (1) density test out of five (5) has a value more than two percent (2%) below the required density.
 - 1) At planting areas, densities shall not be greater than the specified density.

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- D. Survey Verifications of Elevations: Contractor shall submit dimensioned topographic and location survey and written certification by, as specified, a qualified surveyor upon completion of earthwork operations that grades are within the tolerances specified. Refer to Division 1 Section 01700 “Execution Requirements” and Section 01770 “Project Closeout” for additional criteria.
1. Include interim submittals of topographic surveys for excavated sub-grade level and each resultant horticultural planting soil layer to confirm appropriate depths of soil placement. Coordinate preparation with requirements for recording underground utility and subdrainage systems.
 2. Include locations, extent of operations, and surface elevations of excavations and site fill areas related to benchmarks. Relate to existing adjacent grades of Project.
 3. Completed survey will be used for measurements, subsequent earthwork, monitoring of layout progress, and other work on the Project. Relate and coordinate with "as built" survey requirements.
- E. Corrections: If correction of fill or backfill conditions is required in the opinion of the Landscape Architect or Construction Manager, based on test reports or other data, Contractor shall make the following corrections at no additional costs to the Owner and shall allow compensation adjustment of Contract with Owner for costs of additional testing.
1. If fill or backfill at structural conditions have been placed below specified density or on improperly prepared sub-grades, Contractor shall remove and replace in-place soils as directed and provide additional compaction of material to comply with specified requirements.
 2. If fill or backfill conditions at planting areas have been placed above the specified density, Contractor shall remove and re-place the soils or, at the discretion of the Landscape Architect, shall loosen the soils using agricultural equipment and procedures, then re-compact to comply with specified requirements.
 3. If fill or backfill have been placed at incorrect elevations or to incorrect layer depths, Contractor shall remove and replace in-place soils as directed and provide additional compaction of material to comply with specified requirements.

3.12 MAINTENANCE AND PROTECTION

- A. Maintenance:
1. Protection of Graded Areas:
 - a. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
 - b. Repair and reestablish grades in settled, eroded, and rutted areas to the specific tolerances.
 2. Reconditioning Compacted Areas: Where completed and compacted soil or sub-base areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape, and compact to the required density prior to further construction.
 3. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - a. Scarify or remove and replace soil material to depth as directed by Landscape Architect ; reshape and recompact.
 4. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with approved fill, compact, and reconstruct surfacing.
 - a. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

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- B. Cleaning: Promptly remove soil and debris created by work from paved areas of Project or adjacent to Project. Clean wheels of vehicles before leaving site to avoid tracking soil onto roadways, walks, or other paved areas.
- C. Soil Protection Fencing System (For Temporary Use):
 - 1. Install soil/landscape protection fencing at the perimeter of all lawn and/or planting beds inclusive of metal line posts, fencing fabric and plastic ties.
 - 2. Maintain protection fencing until work has been transferred over to the Pier 26 - Landscape Materials Contractor (C4480).
- D. Any soils contaminated by gasoline, oil, plaster, construction debris, unacceptable soils, or other substances that would render sub-grade, finish grade, or a planting soil material unsuitable for proper plant growth shall be removed from the premises whether or not such pollution occurs or exists prior to or during the Contract period. In the event that contaminated material is placed, this material shall be removed and replaced with approved material. All remedial operations associated with use of planting soil mixes shall be reviewed and approved by the Landscape Architect .

3.13 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus satisfactory soil that is in excess of fill/backfill requirements; waste material, including unsatisfactory soil, trash, obstructions and/or debris; and legally dispose of these materials off of Owner's property.
- B. Remove materials resulting from construction operations as the work progresses and/or at direction of Construction Manager.

END OF SECTION 02300

SECTION 02751 – CEMENT CONCRETE PAVING

REISSUED AS PART OF ADDENDUM #2

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Bidding and Contract Requirements and Division 1 specifications govern the Work of this Section. Provide materials, labor, equipment, and services necessary to furnish, deliver, and install Work of this Section as shown on Drawings, as specified or as required by job conditions.
- B. Coordinate Work with that of other trades affecting or affected by Work of this Section and cooperate to assure the steady progress of Work.

1.2 SECTION INCLUDES

- A. This Section includes exterior cement concrete pavement for the following:
 - 1. Walkways.

1.3 RELATED SECTIONS

- A. Related Sections include the following:
 - 1. Division 2, Section “Site Preparation, Demolition, and Removals”
 - 2. Division 2, Section “Earthwork”
 - 3. Division 2, Section “Site Work Joint Sealants”
 - 4. Division 2, Section “Site Furnishings”
 - 5. Division 3, Section “Cast-in-Place Concrete”

1.4 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.
- B. SRV: Slip resistance value.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of manufactured material and product indicated.
- B. Samples:
 - 1. Expansion Joint Fill Material: Three 12-inch lengths.
 - 2. Bags of Aggregate and Inlaid Materials.

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- C. Design Mixtures: For each concrete pavement mixture. Include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- D. Qualification Data: For testing agency.
- E. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:
 - 1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.
 - 2. Compressive strength of concrete test cylinders taken upon delivery of concrete.
 - 3. Slip resistance field test reports.
- F. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:
 - 1. Cementitious materials.
 - 2. Steel reinforcement and reinforcement accessories.
- G. Field quality-control test reports.
- H. Sequence and schedule of concrete pouring(s).
- I. Delivery Documentation: Batch tags for each load of concrete.
- J. Contractor Meeting Notes: Minutes of pre-installation meeting.
- K. Quality Assurance:
 - 1. Documents showing installer's experience and successful installations as required by this Section including color photos of concrete installations, contact information for owner representative and architect of each project, location of each project, completion date of each project, and approximate square footage of each paving installation.
 - 2. Documents demonstrating qualifications of engineer to perform slip resistance tests.

1.6 REFERENCES

- A. Standards Australia (SA):
- B. SA HB 198 Guide to the Specification and Testing of Slip Resistance of Pedestrian Surfaces.
- C. AS 4586 Wet Pendulum Test.

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1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- B. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.
- C. Qualifications of Engineer to Perform Slip Resistance Tests: Professional engineer currently licensed in New York, with minimum 5 years experience performing the specified type of slip resistance test.
- D. Performance Requirements:
 - 1. Wet slip resistance value (SRV) of finished surface shall be between 50 and 60 when using Slider 96 rubber when tested in the field anywhere on the paving surface [after and before water repellent is applied].
- E. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.
- F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
- G. Mockups: Cast mockups of full-size sections of concrete pavement to demonstrate typical joints, surface finish, texture, color, and standard of workmanship for each finish listed in contract drawings and specification.
 - 1. Build mockups in the location and of the size indicated as directed by Landscape Architect.
 - a. Sample Panels for each finish; Broom (both Medium-to-Fine-Textured and Medium-to-Course-Textured), Inlaid and Sandblasted finishes, shall be provided by the contractor in min. 2 foot x 2 foot samples for Landscape Architect to evaluate texture and color tone, per the contract drawings. The approved finishes will then be cast into a larger sample mock-up, that includes all three finishes, for final approval by the Landscape architect and Owner.
 - b. Slip Resistance Testing shall be performed on each mockup.
 - 2. Notify Landscape Architect seven days in advance of dates and times when mockups will be constructed.
 - 3. Obtain Landscape Architect's approval of mockups before starting construction.
 - 4. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed pavement.

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5. Demolish and remove approved mockups from the site when directed by Landscape Architect.
6. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
 2. Products: Subject to compliance with requirements, provide one of the products specified.
 3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
 4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.3 STEEL REINFORCEMENT

- ~~A. Epoxy Coated Reinforcement: ASTM A 1055, Epoxy Coated at exterior locations, conditions permanently exposed to weather and/or water, and where noted on drawings.~~
- ~~A. Steel Wire and Welded Wire Reinforcement: ASTM A 1064, Galvanized at exterior locations, conditions permanently exposed to weather and/or water, and where noted on drawings (plan and/or sections).~~

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PIER 26 UPLAND PARK CONSTRUCTION**2.4 CONCRETE MATERIALS**

- A. Concrete materials shall be manufactured, delivered and placed in conformance with specification section 03310 Cast-In-Place Concrete
- B. Inlaid Aggregate mix shall be manufactured and delivered in accordance with the requirements in part A. For inlaid aggregate finish refer to Part 3 section 7 for execution. The aggregate mix for this portion of the pavement shall be comprised granite and oyster shell.
 - 1. Inlaid aggregate: Maximum size of 1-1/4” Saratoga Granite, quarried by Champlain Stone at the Fort Ann Quarry 7781 Route 4, Fort Ann, NY 12827, (518) 623-2902 or approved equal.
 - 2. Inlaid Oyster Shell: Oyster Shell sizes shall range from 3/8” to 1” washed shells. Shells shall be supplied by Myco Supply, P.O. Box 15194, Pittsburgh, PA 15237, 1(888)- 447-7319 or approved equal.
 - 3. Concrete with inlaid aggregate mix shall be proportioned and tested with report provided by a qualified concrete testing laboratory in accordance with ASTM standards as noted in specification section 03310 Cast-In-Place Concrete.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Proof-roll prepared subbase surface below concrete pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding.
 - 1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph (5 km/h).
 - 2. Proof-roll with a loaded 10-wheel tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
 - 3. Subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch (13 mm) require correction according to requirements in Division 2 Section "Earthwork."
- C. Proceed with concrete pavement operations only after nonconforming conditions have been corrected and subgrade is ready to receive payment.

3.2 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.

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3.3 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

- A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials, which reduce or destroy bond with concrete.
- C. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.
- D. Place reinforcement to obtain at least minimum coverage's for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.
- F. Micro-Fibers: All concrete where indicated on the drawings shall contain the specified micro-fibers. Length shall be per the manufacturer's specification. The dosage rate shall be 1.0 – 1.6 lbs per cubic yard per the manufacturer's specification. Submit proposed dosage rate to Engineer of Record for review prior to concrete placement.
- G. Macro-Fibers: All concrete where indicated on the drawings shall contain the specified macro-fibers. Length shall be per the manufacturer's specification. The dosage rate shall be 3.0 – 5.0 lbs per cubic yard per the manufacturer's specification. Submit proposed dosage rate to Engineer of Record for review prior to concrete placement.
- H. Epoxy-coated reinforcing bars supported from formwork shall rest on coated wire bar supports. Reinforcing bars used as support bars shall be epoxy-coated. In walls having epoxy-coated reinforcing bars, spreader bars where specified by the Architect or Engineer of Record, shall be epoxy-coated. Proprietary combination bar clips and spreaders used in walls with epoxy-coated reinforcing bars shall be made of corrosion-resistant material.
- I. Epoxy-coated reinforcing bars shall be fastened with nylon-, epoxy-, or plastic-coated tie wire, or other acceptable materials.

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- J. Repair of damaged epoxy-coating: When required, damaged epoxy-coating shall be repaired with patching material conforming to ASTM A775. Repair shall be done in accordance with the patching material manufacturer's recommendations.
- K. Unless permitted by the Engineer of Record, epoxy-coated reinforcing bars shall not be cut in the field. When epoxy-coated reinforcing bars are cut in the field, the ends of the bars shall be coated with the same material used for repair of coating damage.

3.5 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
 - 1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.
 - 1. Continue steel reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.
 - 2. Provide tie bars at sides of pavement strips where indicated.
 - 3. Butt Joints: Avoid all butt joints; concrete pours shall terminate at expansion joint locations as indicated in contract drawings. Installer shall plan to have enough material to achieve no butt joints. Notify Landscape Architect if butt joints are required.
 - 4. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
 - 5. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
 - 1. Locate expansion joints at intervals of 20 feet unless otherwise indicated.
 - 2. Extend joint fillers full width and depth of joint.
 - 3. Terminate joint filler not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished surface if joint sealant is indicated.
 - 4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
 - 5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
 - 6. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

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- D. Control Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch (3-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
 2. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.
- E. Edging: No tooled joints unless indicated otherwise on the contract drawings. Eliminate tool marks on concrete surfaces as necessary.

3.6 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.
- E. Do not add water to concrete during delivery or at Project site.
- F. Do not add water to fresh concrete after testing.
- G. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- H. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.
- I. Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed.
1. Remove and replace concrete that has been placed for more than 15 minutes without being covered by top layer, or use bonding agent if approved by Landscape Architect.

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- J. Screed pavement surfaces with a straightedge and strike off.
- K. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- L. When adjoining pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained 85 percent of its 28-day compressive strength.
- M. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.
- N. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:
 - 1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 - 3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 FINISHES**A. SANDBLAST FINISH**

- 1. General: Do not add water to concrete surfaces during finishing operations.
- 2. Sandblast Finish: Begin the sandblasting operation in the first 24 to 72 hours after casting, when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Protect adjacent areas of Sandblast surface with rubber matting or approved material in the direction of the pattern per the contract drawings. Begin sandblasting the exposed surface, with a surface or "skin" removal no greater than 1/4 inch or as approved by the Landscape Architect. The sandblasting equipment to have air compressors with the capacity of 300cfm for each nozzle being used, with a minimum air pressure of 100 psi per nozzle. The nozzle should have a minimum inside diameter of 3/8 inch; the inside diameter of the hose should be a minimum of 1-1/2 inches, to keep the sand in continuous

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suspension. The operator should conform to all safety standards as outlined in Division 1 specifications.

3. The abrasive material used for sandblasting to be either silica sand or hard angular sand. Sand to be free of foreign or deleterious materials, such as fine clay particles, and supplied in sealed sacks.
4. All surfaces to be finished to true planes, per the contract documents.
5. Sandblast finish must meet slip resistance requirements.

B. BROOM FINISH

1. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
2. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch (1.6 to 3 mm) deep with a stiff-bristled broom, perpendicular to line of traffic.

C. INLAID FINISH:

1. Immediately after initial floating, spread a single layer of inlaid aggregate uniformly on pavement surface. Provide an evenly graded application of inlaid elements as shown in the contract drawings.
2. Tamp inlaid aggregate into plastic concrete, and float finish to entirely embed aggregate with mortar cover of 1/16 inch (1.6 mm).
 - a. Spray-apply chemical surface retarder to pavement according to manufacturer's written instructions.
 - b. Cover pavement surface with plastic sheeting, sealing laps with tape, and remove sheeting when ready to continue finishing operations.
 - c. Without dislodging aggregate, remove excess mortar by lightly brushing surface with a stiff, nylon-bristle broom.
 - d. Fine-spray surface with water and brush. Repeat water flushing and brushing cycle until cement film is removed from aggregate surfaces to depth required.
3. Inlaid Aggregate Mixes:
 - a. Type 1: 100% Oyster Shell, 0% Granite Aggregate
 - b. Type 2: 75% Oyster Shell, 25% Granite Aggregate
 - c. Type 3: 50% Oyster Shell, 50% Granite Aggregate
 - d. Type 4: 25% Oyster Shell, 75% Granite Aggregate
 - e. Type 5: 0% Oyster Shell, 100% Granite Aggregate

D. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

E. Comply with ACI 306.1 for cold-weather protection.

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- F. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- G. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- H. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
 - 1. Moist Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.8 PAVEMENT TOLERANCES

- A. Comply with tolerances of ACI 117 and as follows:
 - 1. Elevation: 1/4 inch (6 mm).
 - 2. Thickness: Plus 3/8 inch (10 mm), minus 1/4 inch (6 mm).
 - 3. Surface: Gap below 10-foot- (3-m-) long, unlevelled straightedge not to exceed 1/4 inch (6 mm).
 - 4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch (25 mm).
 - 5. Vertical Alignment of Tie Bars and Dowels: 1/4 inch (6 mm).
 - 6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2 inch (13 mm).
 - 7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches (6 mm per 300 mm).
 - 8. Joint Spacing: 3 inches (75 mm).
 - 9. Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus.
 - 10. Joint Width: Plus 1/8 inch (3 mm), no minus.

3.9 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

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- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain at least 1 composite sample for each 5000 sq. ft. (465 sq. m) or fraction thereof of each concrete mix placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
 3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
 4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
 5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
 6. Compressive-Strength Tests: ASTM C 39/C 39M; test 1 specimen at 7 days and 2 specimens at 28 days.
 - a. A compressive-strength test shall be the average compressive strength from 2 specimens obtained from same composite sample and tested at 28 days.
- C. Strength of each concrete mix will be satisfactory if average of any 3 consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
- D. Slip Resistance Testing:
1. Employ independent engineer to perform slip resistant field tests in accordance with SA AS 4586.
 2. Perform one slip resistant field test on mock-up approved for each finish type to verify wet SRV meets requirements of this Section.
 3. Perform up to 12 slip resistance field tests on installed paving areas at locations determined by the Landscape Architect and Owner to verify wet SRV meets requirements of this Section.
- E. Test results shall be reported in writing to Landscape Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- F. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Landscape Architect but will not be used as sole basis for approval or rejection of concrete.

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- G. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Landscape Architect.
- H. Remove and replace concrete pavement where test results indicate that it does not comply with specified requirements.
- I. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.10 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.
- B. Drill test cores, where directed by Landscape Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.
- C. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 02751

HUDSON RIVER PARK – SEGMENT 3**PIER 26 - UPLAND PARK CONSTRUCTION****SECTION 02870 - SITE FURNISHINGS****REISSUED AS PART OF ADDENDUM #2****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification Sections, apply to this Section.
- B. Coordinate work with that of other trades affecting or affected by work of this section and cooperate to assure the steady progress of work.

1.2 SUMMARY

- A. Work of this Section includes:
 - 1. Site improvements and furnishings: Furnishing and installing all site improvements as indicated on the Drawings.
 - a. Custom Fabricated Steel & “Kebony” Benches
 - 1) Backless Bench
 - 2) Transitions Bench
 - 3) Backed Bench
 - 4) Short Backless Bench
 - 5) Storage Bench
 - 6) Chaise Loungers
 - 7) Window Sill
 - 8) Bar Stool
 - 9) Bar
 - 10) Long Bench
 - b. Wood Shed and Steel Shed with Swing Bench
 - c. Lounger
 - d. Café Tables, Chairs, and Parasol
 - e. Trash Receptacles
 - f. Bicycle Racks
 - g. Bollards
- B. Related Sections include the following:
 - 1. Division 2 Section “Earthwork”
 - 2. Division 2 Section “Drinking Fountains”
 - 3. Division 2 Section “Stabilized Stone Dust Paving”
 - 4. Division 2 Section “Cement Concrete Paving”
 - 5. Division 2 Section “Athletic Equipment, Surface, and Furnishings”
 - 6. Division 2 Section “Site Railings and Gates”
 - 7. Division 3 Section “Cast In Place Concrete”
 - 8. Division 5 Section “Structural Steel Frame”
 - 9. Division 5 Section “Metal Fabrications”
 - 10. Division 6 Section “Wood Decking”

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1.3 SUBMITTALS

- A. General: Refer to and comply with Division 1 Section 01330 “Submittal Procedures”, for procedures and additional submittal criteria.
- B. Qualification Data: For firms and persons specified in “Quality Assurance” Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architect and owners, and other information specified.
- C. Product Data: Submit data for each type of furniture product specified in Part 2 “Products” of this Section and as indicated herein. Include construction details, material descriptions, dimensions of individual components and profiles, finishes, field-assembly requirements, and installation details. In addition, include the following as applicable for each different unit fabrication / unit source:
1. Furfurylated modified wood- “Kebony” Slat Material: Submit technical data for bio-based liquid treated softwood species and finishes/sealers. For bio-based liquid treated softwood species, include all applicable environmental compliance documentation as specified in Division 6 Section 06150 “Wood Decking and Framing”.
 2. Steel Materials: Submit technical data for metals and finishes. Please refer to Division Section 05500 “Metal Fabrications” for all required documentation and compliance standards.
 3. Fastening and support anchoring materials.
- D. Shop Drawings:
1. Field Measurements: Take accurate field measurements in preparation of fabrication shop drawings.
 2. For the following items, submit shop drawings to show all dimensions, metal support brackets/materials, finishes, wood dimensions and connections, installation requirements, and relationship to adjacent elements. Show each condition of mounting and for both radius and straight unit fabrication.
 - a. Backless Bench
 - b. Transitions Bench
 - c. Backed Bench
 - d. Short Backless Bench
 - e. Storage Bench
 - f. Chaise Loungers
 - g. Window Sill
 - h. Bar Stool
 - i. Bar
 - j. Long Bench
 3. For Wood and Steel sheds with swing bench, submit shop drawings to show all dimensions, metal support brackets/materials, finishes, wood dimensions and connections, installation requirements, and relationship to adjacent elements.

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4. For the following items, submit shop drawings indicating method of anchorage and attachment to pavement surfaces, decking, walls, concrete footings, or other base conditions indicated:
 - a. Lounger
 - b. Café Tables, Chairs, and Umbrellas
 - c. Trash Receptacles
 - d. Bicycle Racks
 - e. Bollards

- E. Guarantee: The Contractor shall obtain, in the Government's name, the standard written manufacturer's guarantee of all materials furnished under this Section where such guarantees are offered in the manufacturer's published product data. All these guarantees shall be in addition to, and not in lieu of, other liabilities, which the Contractor may have by law or other provisions of the Contract Documents.

- F. Submit Samples for Initial Selection:
 1. Submit samples of available colors for each item of furnishings of this Section that has factory-applied color finishes to be selected.

- G. Samples for Verification: For each type of exposed finish required, submit finish verification Samples prepared of type and size indicated below.
 1. For "Kebony" Slats: Submit full profile slat, 24 inches long, for each different unit fabrication/unit source.
 2. Typical Finishes: For each bench and furniture type, not less than 6-inches long for linear components and 4-inch square sheet for other than linear components including representative pre-finished metal units.
 3. For Metal Finishes: Please refer to Division Section 05500 "Metal Fabrications".

- H. Quality Control Submittals:
 1. Material Certificates: For items or components of site furnishings as follows and applicable to item, signed by manufacturer.
 - a. "Kebony" Wood: Include certification by manufacturer and from sources that participate in sustainable yield programs as per Division 6 Section 06150 "Wood Decking and Framing".

- I. Contract Closeout Submittals:
 1. Maintenance Data: Submit maintenance data including identification of component replacement source for each unit of site furnishings. Include data in maintenance manuals (See Division 1 Section 01782 "Operations and Maintenance Data").

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Work of this Section shall be fabricated and installed by experienced fabricator(s) or manufacturer(s), who have been previously engaged for a period of at least five (5) years in ornamental metal, or wood work of equal scope and fabrication standards to Project requirements.
 1. Materials, methods of fabrication, fitting, assembly, bracing, supporting, fastening, operating devices, and erection shall be in accordance with Project Contract Drawings and

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Specifications, approved shop drawings, and be of highest quality practices of the industry.

2. Use new and clean materials as specified, having structural properties sufficient to safely sustain or withstand stresses and strains to which materials and assembled work shall be subjected.
 3. All work shall be accurately and neatly fabricated, assembled and erected with smooth finished surfaces.
 4. Field Measurements and Coordination: Verify dimensions with work specified in other sections which adjoins or to which this work will be attached.
 - a. Effect coordination with related work of other sections, including work of other separate Contracts.
 - b. Measurements of adjoining work shall be taken, so that work specified in this Section shall fit closely into the spaces and conditions provide.
 - c. If any unusual conditions are encountered, the nature and location of conditions shall be shown on shop drawings submitted to Construction Manager for determination and approval prior to fabrication.
- B. Shop Assembly: Insofar as is practical, fitting and assembly of work shall be done in-shop to minimize field splicing and assembly.
1. Work that cannot be permanently shop-assembled shall be completely assembled, marked for re-assembly and disassembled in shop before shipment to ensure correct assembly in field.
 2. Shop assembles work in largest practical sizes to minimize field work.
 3. Shop fabricated items shall correctly fit the field condition. In event that shop- fabricated items do not fit the field condition, the item shall be returned to the shop for correction, unless otherwise approved by Contracting Officer.

1.5 DELIVERY, STORAGE AND HANDLING**A. Finished Materials:**

1. The Contractor shall be responsible for timing delivery of all site improvement items, to minimize on-site storage time prior to installation. All stored materials and items must be protected from weather, careless handling and vandalism. Damaged items shall be repaired or replaced, as determined by the Construction Manager.
2. Load and store primed and coated articles off the ground and under cover to prevent formation of wet storage film. Allow air between and around surfaces and allow for continuous drainage of units until installed and painted.

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3. Protect finishes against soiling, staining, or damage from scratches and abrasion. Maintain protection during construction until project completion.

1.6 EXAMINATION OF SITE AND DOCUMENTS

- A. Carefully examine the site before submitting a bid. Be informed as to the nature and location of the Work, general and local conditions including climate, adjacent properties and utilities, conformation of the ground, the nature of subsurface conditions, the character of equipment and facilities needed prior to and during execution of the Work.
- B. Should the Contractor during the course of Work, find any discrepancies between Drawings and physical conditions or any omissions or errors in Drawings, or in layout as furnished by the Architect, it will be his duty to inform the Landscape Architect immediately in writing for clarification. Work done after such discovery, unless authorized by the Landscape Architect, shall be done at the Contractor's risk.

1.7 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Bench Replacement Slats: Not less than 10 full-size “Kebony” Wood slats for each bench type indicated.

PART 2 - PRODUCTS**2.1 MATERIALS, GENERAL**

- A. Wood: Provide softwood of species indicated, surfaced smooth on four sides with eased edges, kiln dried free of knots, solid stock.
 1. Species: “Kebony” Clear RAP decking (spp. Pinus radiata)
 - a. Backless Bench
 - b. Transitions Bench
 - c. Backed Bench
 - d. Short Backless Bench
 - e. Storage Bench
 - f. Chaise Loungers
 - g. Window Sill
 - h. Bar Stool
 - i. Bar
 - j. Long Bench
 2. Species: “Kebony” Clear RAP beam (spp. Pinus radiata) for the following:
 - a. Wood Shed
 3. Species: “Kebony” Clear RAP Boardwalk (spp. Pinus radiata) for the following:
 - a. Swing Bench

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- B. Weathering Steel: Provide weathering steel per Division 5 “Metal Fabrications” Section 05500 for the following:
1. Steel Shed
- C. Anchors, Fasteners, Fittings, and Hardware: Corrosion-resistant-coated or non-corrodible Type 316 stainless steel materials; commercial quality; tamperproof, vandal and theft resistant; concealed, and recessed. Provide as required for site and street furnishings' assembly, mounting, and secure attachment. Refer to Contract Drawings for details of anchorage devices.
1. Unless otherwise indicated and/or approved, use drilled-in type anchors to concrete and stone
- D. Non-Shrink, Non-Metallic Grout: Premixed, factory-packaged, non-staining, non-corrosive, nongaseous grout complying with ASTM C1107. Provide grout, recommended in writing by manufacturer, for exterior applications.
- E. Erosion-Resistant Anchoring Cement: Factory-packaged, non-shrink, non-staining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by anchoring cement manufacturer for exterior applications.
- F. Galvanizing: Where indicated for steel and iron components, provide the following protective zinc coating applied to components after fabrication:
1. Zinc-Coated Tubing: External, zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. (0.27 kg/sq. m) of zinc after welding, a chromate conversion coating, and a clear, polymer film. Internal, same as external or consisting of 81 percent, not less than 0.3-mil- (0.0076-mm-) thick, zinc pigmented coating.
 2. Hot-Dip Galvanizing: According to ASTM A123/A123M, ASTM A153/A153M, or ASTM A924/A924M.

2.2 BACKLESS, TRANSITION, BACKED, & SHORT BACKLESS BENCHES

A. Provide specified Benches using the Parallel 42 as manufactured by Landscape Forms for the “Basis of Design” (no substitutions). Landscape Forms, 7 7800 E. Michigan Avenue, Kalamazoo, MI 49048, tel:(800) 521-2546; www.landscapeforms.com.

~~A.B.~~ Backless, Transition, Backed, Short Backless Benches made of “Kebony” wood and steel shall be provided in the lengths indicated per the Contract Drawings.

1. Backless Bench: Provide a quantity of **8-foot-long Benches** as shown in Contract Drawings
2. Transitions Bench: Provide a quantity of **8-foot-long Benches** as shown in Contract Drawings
3. Backed Bench: Provide a quantity of **8-foot-long Benches** as shown in Contract Drawings
4. Short Backless Bench: Provide a quantity of **4-foot-long Benches** as shown in Contract Drawings

~~B.C.~~ Materials and Fabrication

HUDSON RIVER PARK – SEGMENT 3**PIER 26 - UPLAND PARK CONSTRUCTION**

1. Bench Supports and Framing: Bench supports for Backless, Transition, Backed, & Short Backless Benches shall be of steel. The steel fin supports, as indicated in Contract drawings, shall be of two types: ~~Galvanized Powder Coated Carbon Steel~~ Intermediate supports and Stainless-Steel End supports. All supports shall be mechanically fastened together with formed base connections for anchoring and assembly to deck structures.
 - a. ~~Galvanized Powder Coated Carbon Steel~~ Intermediate Supports: The minimum strength requirements for ~~hot-dipped galvanized~~-steel shall be per Division 5, Section 05500 “Metal Fabrications”.
 - b. Stainless-Steel End Supports: The minimum strength requirements for Stainless-steel shall be per Division 5, Section 05500 “Metal Fabrications”.
2. Wood Slats: Wood slats shall be “Kebony” as specified in Division 6, Section 06150 “Wood Decking and Framing”. Wood Slat sizes as shown on Contract drawings are nominal sizes per manufacturer. All slats to be Clear RAP Decking **7/8” X 5-5/8”**.

2.3 STORAGE BENCH

A. Provide specified Bench using the Parallel 42 as manufactured by Landscape Forms for the “Basis of Design” (no substitutions). Landscape Forms, 7 7800 E. Michigan Avenue, Kalamazoo, MI 49048, tel:(800) 521-2546; www.landscapeforms.com.

~~A.B.~~ Storage Bench made of “Kebony” wood and steel shall be provided in the lengths indicated per Contract Drawings.

1. Storage Bench: Provide a quantity of **30-foot-long Benches** as shown in Contract Drawings

~~B.C.~~ Materials and Fabrication:

1. Bench Supports and Framing: Storage Bench supports shall be of steel. The steel fin supports, as indicated in Contract drawings, shall be of two types: ~~Galvanized Powder Coated Carbon Steel~~ Intermediate supports and Stainless-Steel End supports. All supports shall be mechanically fastened together with formed base connections for anchoring and assembly to deck structures.
 - a. ~~Galvanized Powder Coated Carbon Steel~~ Intermediate Supports: The minimum strength requirements for ~~hot-dipped galvanized~~-steel shall be per Division 5, Section 05500 “Metal Fabrications”.
 - b. Stainless-Steel End Supports: The minimum strength requirements for Stainless-steel shall be per Division 5, Section 05500 “Metal Fabrications”.
2. Wood Slats: Wood slats shall be “Kebony” as specified in Division 6, Section 06150 “Wood Decking and Framing”. Wood Slat sizes as shown on Contract drawings are nominal sizes per manufacturer. All slats to be Clear RAP Decking **7/8” X 5-5/8”**.

~~C.D.~~ Hardware:

1. For Hinges and Hardware refer to **Part 2.1 section C** of this specification.

2.4 CHAISE LOUNGERS

A. Provide specified Chaise Loungers using the Parallel 42 as manufactured by Landscape Forms for the “Basis of Design” (no substitutions). Landscape Forms, 7 7800 E. Michigan Avenue, Kalamazoo, MI 49048, tel:(800) 521-2546; www.landscapeforms.com.

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A.B. Chaise Loungers made of “Kebony” wood and steel shall be provided in the lengths indicated per Contract Drawings.

1. Chaise Lounger: Provide a quantity of **5-foot-long Loungers** as shown in Contract Drawings
2. Chaise Lounger: Provide a quantity of **7.5-foot-long Loungers** as shown in Contract Drawings.
3. Chaise Lounger: Provide a quantity of **12.5-foot Loungers** as shown in Contract Drawings.

B.C. Materials and Fabrication:

1. Chaise Lounger Supports and Framing: Chaise Lounger supports shall be of steel. The steel fin supports, as indicated in Contract drawings, shall be of two types: ~~Galvanized~~Powder Coated Carbon Steel Intermediate supports and Stainless-Steel End supports. All supports shall be mechanically fastened together with formed base connections for anchoring and assembly to deck structures.
 - a. ~~Galvanized~~Powder Coated Carbon Steel Intermediate Supports: The minimum strength requirements for ~~hot-dipped galvanized~~ steel shall be per Division 5, Section 05500 “Metal Fabrications”.
 - b. Stainless-Steel End Supports: The minimum strength requirements for Stainless-steel shall be per Division 5, Section 05500 “Metal Fabrications”.
2. Wood Slats: Wood slats shall be “Kebony” as specified in Division 6, Section 06150 “Wood Decking and Framings”. Wood Slat sizes as shown on Contract drawings are nominal sizes per manufacturer. All slats to be Clear RAP Decking **7/8” X 5-5/8”**.

2.5 WINDOW SILL

A. Provide specified Window Sill using the Parallel 42 as manufactured by Landscape Forms for the “Basis of Design” (no substitutions). Landscape Forms, 7 7800 E. Michigan Avenue, Kalamazoo, MI 49048, tel:(800) 521-2546; www.landscapeforms.com.

A.B. Window Sill made of “Kebony” wood and steel shall be provided in the lengths indicated per Contract Drawings.

1. Window Sill: Provide a quantity of **20-foot-long Window Sill** as shown in Contract Drawings

B.C. Materials and Fabrication:

1. Window Sill Supports and Framing: Window Sill supports shall be of steel. The steel fin supports, as indicated in Contract drawings, shall be of two types: ~~Galvanized~~Powder Coated Carbon Steel Intermediate supports and Stainless-Steel End supports. All supports shall be mechanically fastened together with formed base connections for anchoring and assembly to deck structures.
 - a. ~~Galvanized~~Powder Coated Carbon Steel Intermediate Supports: The minimum strength requirements for ~~hot-dipped galvanized~~ steel shall be per Division 5, Section 05500 “Metal Fabrications”.
 - b. Stainless-Steel End Supports: The minimum strength requirements for Stainless-steel shall be per Division 5, Section 05500 “Metal Fabrications”.
2. Wood Slats: Wood slats shall be “Kebony” as specified in Division 6, Section 06150 “Wood Decking and Framings”. Wood Slat sizes as shown on Contract drawings are nominal sizes per manufacturer. All slats to be Clear RAP Decking **7/8” X 5-5/8”**.

HUDSON RIVER PARK – SEGMENT 3**PIER 26 - UPLAND PARK CONSTRUCTION****2.6 BAR STOOL**

- A. Provide bar stool seats of unit/type specified as “Basis of Design” (no substitutions) as manufactured by Landscape Forms 7 7800 E. Michigan Avenue, Kalamazoo, MI 49048, [tel:\(800\) 521-2546](tel:(800)521-2546); www.landscapiforms.com.
1. Bar Stool : Austin 18-1/2” Wide, backed, material: Kebony Slats, powder coated steel, color: grey aluminum
 2. All hardware and hinges, provided by the manufacturer: All components shall be powder coated steel, assemblies are per Contract Drawings.
 3. Provide quantities per Contract Drawings.

2.7 BAR

A. Provide specified Bar, using the Parallel 42 as manufactured by Landscape Forms for the “Basis of Design” (no substitutions). Landscape Forms, 7 7800 E. Michigan Avenue, Kalamazoo, MI 49048, tel:(800)B 521-2546; www.landscapiforms.com.

~~A.B.~~ Bar made of “Kebony” wood and steel shall be provided in the lengths indicated per Contract Drawings.

1. Bar: Provide one **36-foot-long Bar** as shown in Contract Drawings

~~B.C.~~ Materials and Fabrication:

1. Bar Supports and Framing: Bar supports shall be of steel. The steel fin supports, as indicated in Contract drawings, shall be of two types: ~~Galvanized Powder Coated Carbon Steel Intermediate supports and Stainless-Steel End supports~~. All supports shall be mechanically fastened together with formed base connections for anchoring and assembly to deck structures.
 - a. ~~Galvanized Powder Coated Carbon Intermediate Supports~~: The minimum strength requirements for ~~hot dipped galvanized steel~~ shall be per Division 5, Section 05500 “Metal Fabrications”.
 - b. ~~Stainless-Steel End Supports~~: The minimum strength requirements for Stainless-steel shall be per Division 5, Section 05500 “Metal Fabrications”.
2. Bar Window X-tend Mesh, refer to Division 5, Section 05500 “Metal Fabrications”.
3. Foot Rest: Stainless Steel Pipe, per Contract Drawings. For Stainless Steel refer to Division 5, Section 05500 “Metal Fabrications”.
4. Wood Slats: Wood slats shall be “Kebony” as specified in Division 6, Section 06150 “Wood Decking and Framing”. Wood Slat sizes as shown on Contract drawings are nominal sizes per manufacturer. All slats to be Clear RAP Decking **7/8” X 5-5/8”**.

2.8 LONG BENCH

A. Provide specified Bench, using the Parallel 42 as manufactured by Landscape Forms for the “Basis of Design” (no substitutions). Landscape Forms, 7 7800 E. Michigan Avenue, Kalamazoo, MI 49048, tel:(800)B 521-2546; www.landscapiforms.com.

~~A.B.~~ Long Bench made of “Kebony” wood and steel shall be provided in the lengths indicated per Contract Drawings.

1. Long Bench: Provide one **40-foot-long Long Bench** as shown in Contract Drawings

HUDSON RIVER PARK – SEGMENT 3**PIER 26 - UPLAND PARK CONSTRUCTION****B.C. Materials and Fabrication:**

1. Long Bench Supports and Framing: Supports shall be of steel. The steel fin supports, as indicated in Contract drawings, shall be of two types: ~~Galvanized~~ Powder Coated Carbon Steel Intermediate supports and Stainless-Steel End supports. All supports shall be mechanically fastened together with formed base connections for anchoring and assembly to deck structures.
 - a. ~~Galvanized~~ Powder Coated Carbon Intermediate Supports: The minimum strength requirements for ~~hot-dipped galvanized~~ steel shall be per Division 5, Section 05500 “Metal Fabrications”.
 - b. Stainless-Steel End Supports: The minimum strength requirements for Stainless-steel shall be per Division 5, Section 05500 “Metal Fabrications”.
2. Wood Slats: Wood slats shall be “Kebony” as specified in Division 6, Section 06150 “Wood Decking and Framing”. Wood Slat sizes as shown on Contract drawings are nominal sizes per manufacturer. All slats to be Clear RAP Decking **7/8” X 5-5/8”**.

2.9 WOOD SHED

- A. Wood Shed made of “Kebony” wood and steel, provided in lengths and dimensions indicated in Contract Drawings.
- B. Materials and Fabrication:
 1. Wood Shed Supports and Framing: For all steel framing, and connections, refer to Division 5, Section 05120 “Structural Steel Framing”.
 2. Wood Louvers: Wood Louvers to be “Kebony” as specified in Division 6, Section 06150 “Wood Decking and Framing”. Wood Louvre sizes as shown on Contract drawings are nominal size per manufacturer. All louvres to be Clear RAP beam **38x68mm**.
 3. Footings: Construct concrete footings of cast in place concrete as indicated on the Drawings. Concrete for footings shall be a minimum of 4,000-psi concrete, or as specified in Section 03300 - Cast in Place Concrete. All specifications for quality control, placing, curing, etc. of Cast in Place Concrete in Section 03300 apply here.
 4. Swing Benches included within Shed to be per part 2.10 of this specification.

2.10 SWING BENCH

- A. Provide swing benches of unit/type specified as “Basis of Design” (no substitutions) as manufactured by Landscape Forms 7 7800 E. Michigan Avenue, Kalamazoo, MI 49048, [tel:\(800\) 521-2546](tel:(800)521-2546); www.landscapiforms.com.
 1. Swing Bench: Austin Swing Bench 72”, backed, end arms, material: Kebony Slats, powder coated steel, color: grey aluminum
 2. All hardware and hinges, provided by the manufacturer: All components shall be powder coated steel, assemblies are per Contract Drawings.
 3. Provide quantities per Contract Drawings.

2.11 STEEL SHED

- A. Steel Shed to be made of Site Weathering Steel, provided in lengths and dimensions indicated in Contract Drawings.

HUDSON RIVER PARK – SEGMENT 3**PIER 26 - UPLAND PARK CONSTRUCTION****B. Materials and Fabrications:**

1. Steel Shed Supports and Framing: For all steel Framing connections, refer to Division 5, Section 05120 “Structural Steel Framing”.
2. Weathering Steel to be per Division 5, Section 05500 “Metal Fabrications.
3. Footings: Construct concrete footings of cast in place concrete as indicated on the Drawings. Concrete for footings shall be a minimum of 4,000-psi concrete, or as specified in Section 03300 - Cast in Place Concrete. All specifications for quality control, placing, curing, etc. of Cast in Place Concrete in Section 03300 apply here.
4. Swing Benches included within Shed to be per part 2.10 of this specification.

2.12 LOUNGER

- A. Provide fixed lounge chairs of unit/type specified as “Basis of Design” (no substitutions) as manufactured by Landscape Forms 7800 E. Michigan Avenue, Kalamazoo, MI 49048, [tel:\(800\) 521-2546](tel:(800)521-2546); www.landscapiforms.com.
1. Lounger: Harpo Chaise Lounge, material: Kebony Slats, powder coated steel legs, color: grey aluminum
 2. Provide quantities per Contract Drawings.
 3. Mount loungers as indicated on Contract Drawings, contractor to gain approval of layout by Landscape Architect prior to final mounting. All hardware provided by manufacturer, all components to be stainless steel.

2.13 CAFÉ TABLES, CHAIRS, AND PARASOL

- A. Provide Café Tables, Chairs, and Parasol of unit/type specified as “Basis of Design” (no substitutions) manufactured by Landscape Forms 7800 E. Michigan Avenue, Kalamazoo, MI 49048, [tel:\(800\) 521-2546](tel:(800)521-2546); www.landscapiforms.com
1. Café Chair: Parc Centre Chair- 22” Armless, color: powder coated metal silver. Surface mounted- include mounting hardware, per manufacturer.
 - a. Provide quantities per Contract Drawings. See Installation section for mounting instruction.
 2. Café Table: Parc Centre Table- 30” Round, color: powder coated metal, silver. Surface mounted- include mounting hardware, per manufacturer.
 - a. Provide quantities per Contract Drawings, contractor to provide (4) four additional replacement umbrella canopy fabrics. See Installation section for mounting instruction.
 3. Umbrellas:
 - a. Preferred Option: TUUCI, Ocean Master MAX 10’ Square, Umbrella Fabric color: Natural #6004, Pole Color: Anodized Aluminum. Surface mount-flush per manufacturer.
 - b. TUUCI, Ocean Master Classic 10’ Hexagon, Umbrella Fabric color: Natural #6004, Pole Color: Anodized Aluminum. Surface mount-flush mount per manufacturer.

HUDSON RIVER PARK – SEGMENT 3**PIER 26 - UPLAND PARK CONSTRUCTION**

2.14 TRASH RECEPTACLES:

- A. Provide Trash receptacles of unit/type specified as manufactured by Landscape Forms 7800 E. Michigan Avenue, Kalamazoo, MI 49048, [tel:\(800\) 521-2546](tel:(800)521-2546); www.landscapeforms.com
 - 1. Furnish forty-gallon top-opening style “Chase Park” (w/ heavy duty Hudson River Park latch) freestanding litter receptacle constructed of case aluminum sides, spun aluminum top; cast iron base with stainless steel door hinge and latches; with silver powder coat finish. Provide quantity per Contract Drawings.

2.15 BICYCLE RACKS:

- A. Provide No. RB051G “Ribbon Rack”, galvanized steel finish, as a “Basis of Design” (no substitutions) manufactured by Brandir International Inc., 521 Fifth Avenue, 17th Floor New York NY, (800-849-3488):
 - 1. Provide quantity per Contract Drawings.

2.16 BOLLARDS

- A. Provide Surface Mount Metal Bollards manufactured by Reliance Foundry Co, LTD 207-6450 188 St, Surrey, BC V3S 7G7, Canada; Tel: (604)-592-4333, email- info@reliance-foundry.com
 - 1. Bollard: Model# R-8902, Height 36” x Diameter 4.33” Cylindrical with Round Top, material: Stainless Steel, no color coating, Removable new concrete receiver with chain. Chain eye: 5/16” diameter steel.
 - 2. Provide quantity per Contract Drawings.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Verification of Conditions: Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.
 - 1. Concrete bases and footings are to have been constructed as specified in Division 3 Section 03300 “Cast-in-Place Concrete”.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean concrete substrates to remove dirt, dust, debris, and loose particles that may interfere with item installations.
- B. Remove substances from concrete substrates that could impair bond of setting, grouting, or other installation materials.

HUDSON RIVER PARK – SEGMENT 3**PIER 26 - UPLAND PARK CONSTRUCTION**

3.3 INSTALLATION, GENERAL

- A. Comply with manufacturer's written installation instructions, unless more stringent requirements are indicated. Complete field assembly of site and street furnishing units, where required.
- B. Unless otherwise indicated, install site and street furnishings after landscaping and paving have been completed.
- C. Install item site and street furnishings of this Section level, plumb, true, and securely anchored and positioned at locations indicated on Contract Drawings and in accordance with approved shop drawings with respect to item.
 - 1. Drill-in all anchor attachments unless other attachment type indicated and/or approved. Install without spalling or edge damage to surface finish.
- D. Café Table and Chairs: Contractor to provide all mounting hardware to Owner. Owner to mount all Tables and Chairs, at their discretion.

3.4 CLEANING

- A. After completing site and street furnishing installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.

3.5 PROTECTION

- A. Use all means necessary to protect materials of this Section before, during, and after installation and to protect the installed work and materials of all other trades.

END OF SECTION 02870